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Monitoring and Evaluation Framework of Transportation Infrastructure

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RESEARCH, MONITORING & EVALUATION

M&E

MONITORING AND EVALUATION FRAMEWORK OF TRANSPORTATION INFRASTRUCTURE

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Preamble

After the promulgation of Constitution of Nepal, 2072 (2015), Nepal has entered into the socialism oriented federal republican state and that too after the formation of three their autonomous federal, provincial and local government, the essence of intervention in transport infrastructure has become even more pivotal. This has become so not only to achieve the progressive and innovative policies and programs laid by the government with motto *"Prosperous Nepal Happy Nepali"* but also to address the structural tailbacks of the economy in order to boost production, employment generation, self-reliance and enhancement of road connectivity for achievement of basic goals of Sustainable Development Goals (SDGs) by 2030.

Transport infrastructure aids in (i) augmenting the **economy** through employment generation, increased agricultural productivity and marketed surpluses, greater use of external markets with commensurate increase in prices and returns and diversified opportunities. (ii) improvise overall **education** system through increased provision of easy access to educational facilities. (iii) ameliorate **health and sanitation** by providing access to medical facilities. (iv) guarantee **gender equality** as transport services allow women to empower themselves by allowing them to develop other income generating activities and participate more in community affairs. (v) support more **effective governance** as transport networks is a physical manifestation of the national government's ability to exercise political power deliver services and collect taxes and revenues.

All the above mentioned aspects are among many of the basic goals of SDGs which Nepal is committed to in achieving by 2030. **Monitoring and Evaluation Frameworks** of Transport Infrastructures in a major tool in order to access the indicators and make prompt decision. It can be clarified with the following:

A jumbo jet with full of passengers was flying above the high clouds and all of a sudden, there was an announcement saying-

"dear passengers, this is an announcement to inform all of you that we need not worry about the shortage of fuel, all of its engines are perfecting working and everything is perfectly fine. However, a little problem is that the compass is not working and we are worrying about our directionless flight"

The above anecdote gives clear message to any development project worker that despite the abundance of human, finance, physical facilities, logistic supports etc., and the entire project could be a complete jumble in the absence of effective Monitoring and Evaluation Framework.

In fact, monitoring mechanism works as a compass instrument to indicate the progress status of all the activities scheduled in a work implementation plan, Based on the information received form monitoring system, evaluation performances, it is deemed necessary in order to achieve a certain target/objective. Various types of transport infrastructure projects carried out by development actors manifest the pace of country's development process. Nevertheless, the information obtained through M& E system informs us the direction of whether the works being performed are in right track or not. Henceforth, in order to inspect the implementation plan of transport infrastructure development, the essentiality of establishing and designing a sound M& E framework is indispensable.

Abbreviations and Acronyms

ADB→ Asian Development Bank
APP→ Annual Performance Plan
ATM→ Automated Teller Machine
BOOT→ Build Own Operate Transfer
BOT→ Build Own Transfer
CBA→ Cost Benefit Analysis
CBS→ Central Bureau of Statistics
CCTV→ Closed Circuit Television
DAC→ Development Assistance Committee
DfID→ Department for International Development (U.K.)
DoLI→ Department of Local Infrastructure
DoR→ Department of Roads
DP→ Development Partner
EA→ Enumeration Areas
EC→ European Commission
EIRR→ Economic (Internal) Rate of Return
EMP→ Environmental Management Plan
ESIA→ Environmental and Social Impact Assessment
FAO→ Food and Agricultural Organisation
FGD→ Focus Group Discussions
GDP→ Gross Domestic Product
GIS→ Geographic Information System
GoN→ Government of Nepal
GPS→ Global Positioning System
GSM→ Global System for Mobile Communications
HAM→ Hybrid Annuity Model
HBS→ Household Budget Survey
HoD→ Head of Department
HPM→ Highway Planning and Maintenance
IAT→ Independent Assessment Team
IBRD→ International Bank for Reconstruction and Development
IDP→ Integrated Development Plan

IDTR→ Institute of Driver Training and Research
IE→ Impact Evaluation
IFAD→ International Fund for Agricultural Development
IFPRI→ International Food Policy Research Institute
IFRTD→ International Forum for Rural Transport and Development
IL→ Intermediate Lane
ILO→ International Labour Organisation
IMF→ International Monetary Fund
IMT→ Intermediate Means of Transport
IRR→ Internal Rate of Return
LFM→ Logical Framework Matrix
LSMS→ Living Standards Measurement Surveys
M&E→ Monitoring and Evaluation
MCC→ Millennium Challenge Corporation
MDG→ Millennium Development Goal
MEF→ Monitoring and Evaluation Framework
MEP→ Monitoring and Evaluation Plan
MfDR→ Managing for Development Results
MIS→ Management Information System
MPI → Maintenance Performance Indicator
MTEF→ Medium Term Expenditure Framework
NGO→ Non-governmental Organisation
NH→ National Highway
NPC→ National Planning Commission
NPV→ Net Present Value
OECD→ Organization for Economic Co-operation and Development
OP→ Operational Plan
OVI→ Objectively Verified Indicator
PMMR→ Performance Based Management and Maintenance of Roads
PPP→ Public Private Partnership
PRIA→ Project Road Influence Area
PSM→ Propensity Score Matching
PSNP→Productive Safety Net Program
PTA→ Participatory Transport Appraisal
PTA→ Participatory Transport Assessment
QAP→ Quality Assurance Plan
QIECP →Quick Impact Employment Creation Project

R&D→ Research and Development
RAI→ Rural Access Index
RAPI→ Rapid Assessment of Poverty Impacts
RBM→ Results Based Management
RCT→ Randomized Control Trial or Experiment
RDP→ Rural Development Project
RED→ Road Economic Decision Model
RFID→ Radio Frequency Identification
RODMAS→ Road Measurement and Data Acquisition System
RPM→ Road Prioritization Methodology
RT→ Rural Transportation
RTA→ Rapid Transport Appraisal
RTI→ Rural Transport Infrastructure
RTO→ Regional Transport Office
RUSS→ Road User Satisfaction Survey
SDG→ Sustainable Development Goal
SNRTP→ Strengthening the National Rural Transportation Program
SP→ Strategic Plan
TA→ Technical Assistance
TII→ Traffic Infrastructure Investment
ToR→ Terms of Reference
TT→ Technical Team
VOC→ Vehicle Operation Centre
WB→ World Bank
ZoRI→ Zone of Road Influence

Executive Summary:

According to Stern, "*Causation without explanation is insufficient for policy learning because policymakers need to understand why as well as how if they are to use findings from research or evaluation for future policy-making*".
Government of Nepal (GoN) has identified economic growth as a key aspect to poverty reduction and making progress towards the Sustainable Development Goals (SDGs). Traffic Infrastructure Investment (TII) is one of the key drivers of economic growth. In response, it is high time to improve the transport infrastructure policies and finance high-priority infrastructure in conjunction with other international donors. Furthermore, it is utmost to design a Monitoring and Evaluation (M&E) framework in order to enhance the evidence quality and maintain a platform for future design as well.
To support the achievement of the development goal and other key objectives, NPC has developed a Monitoring and Evaluation Framework (MEF) to capture performance information and data at two levels– through individual activities and through defined program outcome areas. M&E of Transport Infrastructures is primarily about ensuring that the program delivers quality activities through appropriate selection of activities. It is imperative that the program supports improved infrastructure priority setting and investment and to ensure resource allocation is appropriate between thematic and sectoral areas.

Chapter-1 deals with conceptual underpinnings of M&E Framework with key considerations that has to be taken into account while designing such framework. This mainly underlines the sequential steps regarding inputs, activities, outputs, outcomes and impacts that are to taken into account while formulating MEF.

Chapter-2 underlines the legislative, policy and strategic context that MEF should be adhered to. NPC is a central agency for monitoring and evaluating development plans, policies and programs. Strategic Plan (SP) and Annual Performance Plan (APP) are essential to the monitoring and evaluation processes. This chapter also focusses on legislation that need to be developed in regard to effective M&E.

Chapter-3 emphases on transport policy indicators that help to measure changes brought about by projects and as such should be specific to the sector and objectively verifiable.
There is a lack of evidence on both the development impacts of transport improvements and their benefits to the people. This knowledge gap stems from the methodological weaknesses of existing

impact studies and the failure to undertake robust baseline data collection before the launching of a transport project. This failure is compounded by poor sample design and analysis of collected data. Impact studies tend also to be traffic focused and assume that resultant transport services are affordable and appropriate to the people.

In order to achieve the basic targets of Sustainable Development Goals (SDGs) and to track it properly whether we are on the right track or not, effective MEF of transport intervention is fundamental.

Similarly, generation of Impact Monitoring and Evaluation (M&E) is also necessary for contributing to effective development with chronological evidences and tracking.

Chapter-4 demonstrates M&E processes and standards with steps to be followed as:

- *Engagement with stakeholders* to define the programmes/projects or other interventions to be evaluated and the specific performance questions to be evaluated.
- *Planning and designing the evaluation*: Each intended evaluation will have to follow the outlined M&E principles and should have a detailed programme or project evaluation plan
- *Conducting the evaluation*: This includes assembling evaluation evidence through methodologically sound collection of credible data using various methods: qualitative or quantitative, experimental, observational or some mixture of the above.
- *Sharing lessons learnt and follow-up*: The findings of evaluation processes should be communicated in ways that will be easily understood and acted upon by stakeholders. Follow-up should be done to see if policy, programme or project design and implementation take evaluation findings into account.

Chapter-5 exhibits the different types of MEF such as conceptual (theoretical or casual) framework, results (strategic) framework, logical framework and logic model.

Among them, Logical Framework Matrix (LFM) is one of the best methods for setting up a monitoring and evaluation system which helps define the basic assumptions on which the project design and implementation systems are based.

The purpose of logic models is to present a clear plan for the use of resources to meet the desired goals and objectives. They are a useful tool for presenting programmatic and evaluation components. An underlying assumption of logic models is that there is a linear relationship flowing from program inputs to processes/activities, which, in turn, result in outputs that ultimately lead to long-term outcomes and impact

Chapter-6 provides clear visual definition with key principles and steps for effective M&E of transport effects/impacts with methodologies.

In project terms, impact evaluations are the final stage of the M&E process, preceded by and to some extent drawing on the results monitoring of the rural transport project outcomes. Impact evaluation is therefore a post project activity used to assess whether the investment has achieved its development goal.

Most rural transport projects use quantitative techniques to assess impacts, which belong to five main types. The first two are macro and sector studies, using secondary data to test existing theories and hypotheses on the relationship between rural transport and the development process, and predict the likely poverty reducing impact of a rural transport investment policy.

The next three are used to evaluate specific projects. They range from cross sectional studies to panel surveys with the latter emerging as the more robust and methodologically sound approach. This is particularly the case if a Randomized Control Trial (RCT) sampling of household respondents is adopted and propensity score matching is applied to identify comparable treatment and non-treatment groups as the basis for the counterfactual—what would have happened without the intervention. These have been called the "gold standard" impact methodologies but rural transport projects may not be large enough to warrant the technical and financial resources needed to collect and analyze the large quantities of impact data required by such an evaluation. This emphasis on increasingly sophisticated quantitative techniques has meant that qualitative techniques are usually used to triangulate or crosscheck the econometric findings. Rarely are they used as a stand-alone evaluation.

All of these techniques use a range of indicators to measure direct and indirect effects and impacts. One indicator though missing from this list is the Rural Access Indicator (RAI), the defined percentage of population living within 2 kilometers (20-25 minutes' walk) of an all-weather road. This type of data is usually collected and developed at the macro level but there are notable inconsistencies in the way it is measured. These inconsistencies need to be addressed if the RAI is to remain as a high-level access indicator capable of generalization within and between countries.

The adopted methodology for an impact evaluation is usually a compromise between the information needs of the funding agency/counterpart line ministry and the project provision for M&E. Budget constraints usually mean that project management focuses on methodologies that quantify project results or outcomes notably transport cost savings enjoyed by road users. Thus, many rural transport project logical frameworks specify traffic or access changes as objectively verified indicators with a supplementary expectation that there will be a similar reduction in transport charges. Access indicators associated with attendance and use of markets, health centers, schools, etc. might also be included as objectively verified indicators. These performance or outcome indicators are easy to collect and analyze while project management and the subsector ministry alike will readily understand the findings and justify the investment in cost benefit terms without any need to understand the long-term impact.

This approach has worked where the road network is well trafficked, which is not the case for a number of rural transport projects. In this situation, the proponents of quantitative techniques have argued that traffic-based evaluations need widening to include household and community surveys, which capture the full development impact of RT improvements.

The high cost and resource demands of this more rigorous and defensible impact study mean that it is only occasionally used, usually in situations where development partners and clients have a need for impact data to inform their policy and program commitments. Most transport projects usually adopt a results or performance approach to project monitoring. This type of impact

evaluation is methodologically sound if it stays focused on the direct traffic and transport benefits of a project. In this way, it provides subsector feedback on the success of its planning and appraisal procedures and meets the accountability needs of financing agencies and development partners. However, it has a number of weaknesses the most important of which is its inability to assess the distribution of benefits in poverty terms. Here it is recommended that qualitative PRA techniques in social mapping/modeling and wealth/well-being ranking are explored as a means of answering the question of who benefits from transport interventions.

Chapter-7 focusses on coping up with change management, strengthening the capacity building and institutionalizing for effective monitoring and evaluation.
Change management for M&E requires an understanding of who the internal and external stakeholders are, what their specific M&E needs are and identifying suitable communication channels for them.
The M&E of NPC shall establish the unit in line with federal, provincial and local level requirements and accordance with best practice.
A review of the M&E Framework shall take place annually, and should include the testing of the M&E system and how this can be refined and improved over time.

Chapter-8 shows the link between M&E Framework (MEF) and plan (MEP) where MEF describes the approach that the organization/department undertakes in developing an M&E system whereas MEP is the set of aspects for data collection, analysis and reporting for the targeted indicators which any organisation/department is required to look upon

Annexes portray the specific undertakings to be followed upon including internationally accepted standard guidelines, standard reporting procedure and glossary of the explicit terms used in MEF.

Finally, this report is a nutshell of specific activities and procedures that need to be adopted while performing an effective Monitoring and Evaluation Framework (MEF) processes of transportation infrastructures.

1. Conceptual Underpinnings of Monitoring and Evaluation (M&E)

Monitoring: involves collecting, analyzing, and reporting data on inputs, activities, outputs, outcomes and impacts as well as external factors, in a way that supports effective management. Monitoring aims to provide managers, decision makers and other stakeholders with regular feedback on progress in implementation.

Evaluation: is a time-bound and periodic exercise that seeks to provide credible and useful information to answer specific questions to guide decision making by staff, managers and policymakers. Evaluations may assess relevance, efficiency, effectiveness, impact and sustainability. Impact evaluations examine whether underlying theories and assumptions were valid, what worked, what did not and why. Evaluation can also be used to extract crosscutting lessons from operating unit experiences and determining the need for modifications to strategic results frameworks.

Inputs: all the resources that contribute to the production and delivery of outputs. Inputs are "what we use to do the work". They include finances, personnel, equipment and buildings.

Activities: the processes or actions that use a range of inputs to produce the desired outputs and ultimately outcomes. In essence, activities describe "what we do".

Outputs: the final products, or goods and services produced for delivery. Outputs may be defined as "what we produce or deliver".

Outcomes: the medium-term results for specific beneficiaries that are the consequence of achieving specific outputs. Outcomes should relate clearly to an institution's strategic goals and objectives set out in its plans. Outcomes are "what we wish to achieve".

Impacts: the results of achieving specific outcomes, such as reducing poverty and creating jobs.
Inputs, Activities, Outputs, Outcomes and Impacts form the results chain, and each of these aspects need to be monitored. The new outcomes approach is placing more emphasis on the results (outcomes) of department's deliverables. Correct understanding and defining of the elements in the results chain with regards to the department's strategic objectives is essential to developing an M&E Plan which will produce useful data for management. As M&E develops, the department will define M&E concepts which are specific to their work and sector. This standardization is important for credible M&E Plans and such learning comes with continuous review.

A well thought out monitoring and evaluation framework can assist greatly with thinking through programmatic strategies, objectives and planned activities, and whether they are indeed the most appropriate ones to implement.

Considerations when developing a monitoring and evaluation framework
Asking questions:

- What are the objectives of the monitoring activities?
- What are the specific questions that need to be asked to gauge the progress of the intervention?
- What information is needed to see if activities are being implemented in the way that was planned, and who can provide that information?
- What are the objectives of the evaluation?
- What are the specific questions that need to be answered to gauge the impact and success of the intervention?
- What information is needed to determine if the expected objectives and outcomes were accomplished and who can provide that information?
- Determining whether the questions being asked are appropriate ones for understanding how "successful" the intervention has been with respect to its expected objectives and outcomes?

It is also important to keep in mind that:

- Different kinds of interventions (policy change, awareness raising campaigns, community mobilization, improving service delivery and response) will need different kinds of frameworks, tools and indicators.
- An appropriate framework for monitoring and evaluation of activities can be designed and implemented even when a) programmes do not have significant resources b) programme staff and implementers, service providers and policy makers feel they do not have additional time to devote to monitoring and evaluation.
- Many existing tools can be adapted to specific contexts and monitoring and evaluation needs. If monitoring and evaluation activities and tools are considered and built into programmatic work or service provision from the start, the resource and time burden is minimized.
- It is important to clarify objectives, what information will be most useful in reaching those objectives and what information is already available or easily collected.

There are creative ways to deal with resource constraints, such as:

  - Including a generous line item for monitoring and evaluation when submitting proposals to donors;

- Using resources wisely by choosing methods that are feasible, reliable and most likely to yield information to improve the programme.
- Collecting only enough data than can be realistically analyzed or used.
- Finding ways to pool resources and collaborate with other organizations. In some settings, university students can offer assistance in return for research experience.

Steps in Developing Monitoring and Evaluation Frameworks

Programme implementers (often from diverse sectors) should jointly take steps in developing the monitoring and evaluation framework.

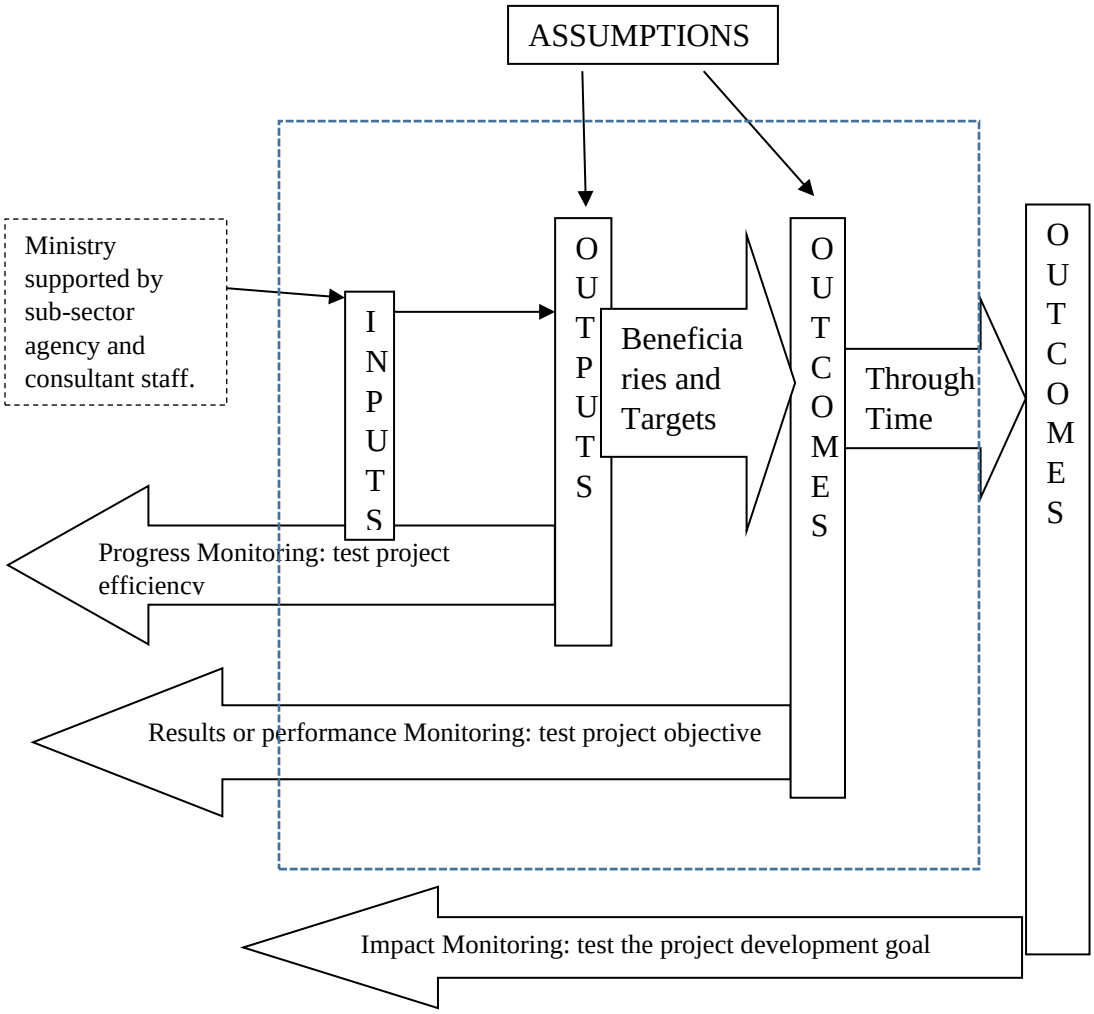
1. They should determine the purposes of the monitoring and evaluation mechanisms and assess the information needs of each indicator.
2. Ensure prevention and response interventions have clearly defined objectives, outputs and indicators;
3. Establish coordinated and common reporting tools;
4. Determine methods for obtaining information on indicators;
5. Assign responsibilities for information gathering, determine time frame and frequency of data collection, and allocate resources; and
6. Establish mechanisms for sharing information and incorporating results into prevention and response planning.

A monitoring & evaluation system is an essential element of planning, design and implementation of a transport project as it serves to assess whether it has achieved its objective and its development goal. Figure 1-1 outlines the monitoring hierarchy in Logical Framework terms, the dotted line outlining normal project responsibilities and impact monitoring identified as a post-project activity.

In this model, performance or results monitoring identifies the immediate or short term direct and indirect effects or outcomes brought about by a transport intervention. In contrast, impacts are the longer-term changes in social and economic well- being arising as beneficiaries adjust their travel and transport behavior in response to the new opportunities brought about by the intervention. As a rule, effects are associated with traffic and transport, whereas impacts arise when these effects are sustained over time through maintenance. Ideally, an Impact Evaluation establishes the net effects and impact of a transport intervention on specific “treatment” units i.e. households, enterprises or locations such as roads and/or communities that have benefitted from a project. The evaluation compares these findings with those collected from similar units that have not benefitted from the project. These are “controls” or “non-treatment” units, which represent the counterfactual i.e. what would have happened if the intervention had not occurred.

The below figure equates Performance Monitoring with Results Monitoring to describe each type of monitoring. The figure takes a narrower definition of Progress Monitoring as the assessment of implementation efficiency, i.e. comparing actual against expected financial and physical progress

Figure 1-1 Monitoring and Evaluation of Transport projects



A good M&E system helps ensures that a project

- Is being efficiently implemented
- Is reaching the intended target groups
- Is achieving its intended objectives

In addition, it would

- Monitor the **use** of **project inputs**
- Monitor the **effectiveness** of the **project implementation process**

- Monitor the **production** of **project outputs**
- Assess **project impacts** on the target communities
- Assess the **effectiveness** of **project outputs** in producing the intended short-term and long-term impacts.
- Assess the extent to which these **impacts** can be attributed to the **effects of the project**.

2. Legislative, Policy and Strategic Context

The National Planning Commission (NPC) is the apex advisory body of the Government of Nepal (GoN) for formulating a national vision, periodic plans and policies for development. The NPC assesses resource needs, identifies sources of funding, and allocates budget for socio-economic development. It serves as **a central agency for monitoring and evaluating development plans, policies and programs**. The NPC also serves as an intellectual hub for the exchange of new development ideas and proposals from scholars, private sector, civil society, and development partners.

Adhering to the following legislative, policy and strategic context, the Monitoring and Evaluation Framework shall be executed:

- Constitution of Nepal, 2072 (2015)
- Good Governance (Management and Operation) Act, 2064 (2008)
- Right to Information Act, 2064 (2007)
- Regional Development Plans (Implementation) Act, 2013 (1956)
- Financial Procedures and Fiscal Management Act, 2076 (2019) and its Regulations, 2077 (2020)
- Public Debt Act, 2059 (2002)
- Development Cooperation Policy, 2071 (2014)
- The Foreign Investment and Technology Transfer Act, 2049 (1993)
- Other relevalent Acts, Rules and Regulations ratified by Federal/Provincial Parliament
- International Treaties and Conventions
- National Monitoring and Evaluation Guidelines, NPC, 2013
- Integrated National Evaluation Action Plan of Nepal (2016-2020), NPC
- Policies and Programs of Nepal Government
- Cabinet's Executive Order

In addition to it, NPC shall also discharge its core responsibilities in terms of the following transportation projects related specific legislative mandates which could be outlined as below:

- Motor Vehicles and Transportation Management Act 2049 (1993)
- Public Roads Act, 2031 (1974)
- Environmental Protection Act, 2053 (1997) and its Regulations, 2054 (1998)
- Land Acquisition Act, 2034 (1977)
- Public Procurement Act, 2063 (2007) and Regulations, 2008 (2064)
- Road Board Act, 2058 (2002) and its Regulations, 2060
- National Transport Policy, 2058 (2001/2)
- Public-Private Partnership and Investment Act, 2075 (2018)

- Nepal Road Standard, 2027 (1st Revision 2045 and 2nd Revision 2070)→ NRS 2070
- Nepal Feeder Roads Standard, 1997 A.D.
- Nepal Rural Roads Standard, 2055 (2nd Revision, 2071)
- Nepal Urban Road Standard, 2076 (2019)
- The Department of Roads Strategy, 1997 A.D.
- Standard Specifications for Road and Bridge Works, 2073

Essential to the monitoring and reporting processes in the department is the Strategic Plan (SP) and Annual Performance Plan (APP). It is against these plans that the department must monitor and evaluate its progress. A common challenge in government departments, and which has also been identified in the NPC, is that of reliable data in the strategic plan. This includes the baseline, targets set and indicators chosen. Following that, credible and accurate information on actual performance needs to be collected on an on-going basis, which is then used to support managers in their decision making processes, thereby improving service delivery and governance. The developing of a department-wide approach to generate reliable performance information which can be utilised for monitoring and evaluation is the most pressing need.
The major risk to achieving this, will be generating buy-in from officials at all levels of the department who may consider M&E as a policing tool; malicious compliance to M&E requirements rather than identifying the value that M&E can add to the organisation; insufficient capacity building, communication and change management required to develop a reliable M&E system; and a lack of incentives to comply with required reforms.

The following main pieces of M&E legislation need to be developed in regard to effective M&E framework:

- The Medium Term Strategic Framework
- Green Paper on Improving Government Performance: Our Approach
- Green Paper on National Strategic Planning
- Policy Framework for the Government-wide Monitoring and Evaluation System
- Framework for Managing Programme Performance Information
- Statistical Quality Assessment Framework
- Federal/Provincial/Local Growth and Development Strategy Guidelines
- Role of NPC in Government-wide Monitoring and Evaluation: A Good Practice Guide
- Public Finance Management Act
- Strategic Planning Guidelines
- Performance Information Handbook

3. Transportation Project and Policy Indicators

Transport indicators are variables that help measure changes brought about by projects and as such should be specific to the sector and objectively verifiable. In case of, each monitoring stream will use objectively verifiable indicators, outlined in the project Logical Framework Matrix–LFM (as discussed in Chapter-4), to monitor the progress, performance and impact of the intervention:

- What progress a transport project or program has made?
- The efficiency and effectiveness of project performance in meeting targets,
- That the predicted effects/outcomes are happening, and
- To what extent its development goals have been met?

However, indicators only provide an indication that something has happened —they are not proof and cannot tell us:

- Why a project has made a difference
- Why and how the changes have occurred

A. TRANSPORT PROJECT MONITORING INDICATORS

Effect and Impact indicators: Effect and impact indicators cannot be constructed without clarifying what aspect of the socio-economic environment is being "impacted" and what the indicators will "indicate" beyond their intrinsic properties. There are two possible starting points for the identification and selection of indicators. For research programs which feed into policy formulation, indicators are derived from hypotheses based on suppositions made about the positive role that interventions play (transport changes, economic growth, social development or poverty alleviation). This positivist perspective stresses benefits, identifies and mitigates negative effects and seeks confirmation that the investment was worthwhile. For projects, this positivistic logic is distilled into a project logical frame in which project outcomes/effects and impacts are identified as objectives and goals or purposes. Invariably this includes a preliminary selection of objectively verified indicators (OVI), sources of verification and assumptions made that might affect the achievement of the objective or purpose in the form of a LFM (as discussed in Chapter-4).

This distinction is important and ultimately explains the difference between performance and impact monitoring (Figure 1-1). Performance monitoring is effectively project monitoring and is relatively straight forward since expected effects and impacts have already been defined and even quantified in the logical framework. That said there is a danger that this very simplicity will lead to a blueprint approach to assessing project achievements, reducing evaluations to quantitative methodologies that produce two-dimensional cause-and-effect explanations within a simple with/without longitudinal project sampling frame (No 4 of Table 3-2).

Policy impact studies are less constrained and as a result, much more complex since they need to take account of interactions between the complimentary or competing goals of stakeholders/actors involved in rural development as well as overall development goals. It is therefore good practice to distinguish between effect and impact indicators. For rural transport interventions, outcome performance indicators are associated with traffic and access effects as captured by the first group of direct effect indicators in Table 3-2.

These indicators respond quickly to the intervention and are easy to collect and report on as elaborated below. Access indicators do not require a traffic response since they reflect changes in physical accessibility of the affected population or beneficiaries. Both these effects are measurable within the project period but on their own may not be enough to stimulate the behavioral changes that cumulatively bring about an impact.

These behavioral changes emerge over time in the form of increased income, health, education and general well-being (Table 3-2) of the transport affected population. The strength of impacts are subject to policy changes, road maintenance and random fluctuations in rainfall, market prices, cost of fuel etc. These background changes and fluctuation will increase over time making the identification and attribution of impacts much more complex and the need to be factored into the timing of the follow-up survey(s).

Finally, indicator data and impact analysis should be disaggregated and presented for different population subgroups e.g. by gender, vulnerable and/or the poor and capable of aggregated and generalized at the national, regional or global level.

In summary, the impact evaluators need the foresight to decide the scope of impact, to design a research methodology and select appropriate indicators that can be used to test relevant transport hypotheses before constructing the planned interventions of the project. This selection involves understanding and integrating the project logical framework with the development literature. Once finalized, the indicators are framed into data collection tools and applied as a baseline against which first performance and then impacts can be assessed.

Transport service indicators:

Transport service indicators are usually collected to monitor project effects by longitudinal impact studies and focus on the cost, speed, comfort, reliability and safety of the vehicles transporting people and goods. A number of publications, notably those by Starkey et al (2002, 2007 and 2010) as well as I.T. Transport (2003), give an idea of issues and indicators used to assess the supply and demand for rural transport services. The latest publication by Starkey et al. suggests that six headline indicators should be used for each vehicle ‘class’ encountered on a road network:

- Fare price per passenger kilometer
- Transport frequency on normal days
- Costs per tonne-kilometre of small / consigned medium freight (50 kg and 200 kg loads)
- Costs per tonne-kilometre of highly weighted freight (more than 200 kg loads)
- Transport Service reliability and predictability index for return trips to the market/services hub
- Transport Service disruption index

Transport Development policy Indicators

Some of the fundamental interventions that would support the achievement of the 2030 targets of Sustainable Development Goals (SDGs) could be outlined as:

- Halving the proportion of the rural population living beyond 2 km of an all-season road (Rural Access Index).
- Narrowing the difference in average transport costs within Nepal by 50% as compared to other developed countries (India and China)
- Eliminating constraints on the time that children spend in obtaining quality education safely by improving rural access and urban mobility.
- Facilitating affordable access for all households and cost effective outreach of health activities.
- Ensuring that the transport sector stops to be an agent for spreading HIV/AIDS.
- Reducing road accident fatalities by half.
- Halving the number of urban and rural residents who have limited access to employment and essential services due to mobility constraint.
- Promoting environmental sustainability in all transport operations and development programs.
- Coordination in development with India and China through reduction by half transport costs for landlocked and transit countries like Nepal and improving their access to global markets.
- Dismantling all non-physical transport barriers including journey time, customs clearance, and border delays that impede the flow of goods and services.
- Mainstreaming gender issues in transport policies and programs.

Above all, RAI is better seen as a measure of network density rather than as an absolute indicator of the required level of investment. It is best used in the framework of a mixture of different standards of road and a vibrant rural economy generating sufficient demand to attract a supply of different and competing transport services. Where this is absent then the need to improve the overall access of rural communities and deliver the last “mile” is best served by footpaths or IMT tracks built and maintained by communities to a level that reflects their importance and use. For this reason, Walker calculated a second measure of access, which was district-level road density (kilometers of road length per sq. km. area). This measure is also highly scale dependent, but it

provides a population independent measure of road network availability. From an impact perspective, RAI is mainly of value for international and intra-national multifactorial regression or econometric analysis. Here the above concerns have to be taken into account when making comparisons and drawing associations between RAI and socio economic indicators.

Table 3-1 Indicators for the socioeconomic impact assessment of Transport Projects

1. Direct effects Traffic, Transport and Access Outcome Indicators
Traffic volume (Vehicles per day, frequency of service) Data collection point (indicative only): Roadside census site Disaggregated by: Transport mode including motorized, non-motorised and pedestrians; season
Road pass ability (number of days of road closure) Data collection point (indicative only): Roadside census site Disaggregated by: Transport mode and season
Transport tariffs per passenger (passenger-km) and freight (tone-km) Data collection point (indicative only): Roadside census site Disaggregated by: Transport mode and season
Travel and transport patterns (number of trips, duration and purpose) Data collection point (indicative only): Household Disaggregated by: Transport mode, gender and social class
Vehicle ownership (motorized and non-motorized) Data collection point (indicative only): Household Disaggregated by: Transport mode, gender and social class
Accidents (injuries and fatalities) Data collection point (indicative only): District/Region police offices Disaggregated by: Social class, age and gender
Access to education (school enrolment, attendance and drop-out) Data collection point (indicative only): Household/community Disaggregated by: Social class and gender
Access to health facilities (number of visits over past month, access time for Emergency vehicles (Ambulance, Fire fighter etc) Data collection point (indicative only): Household/community Disaggregated by: Social class and gender
Time use of household members (time spent on water and fuel wood collection and other transport tasks) Data collection point (indicative only): Household Disaggregated by: Social class and gender
Other (Access to credit, migration patterns) Data collection point (indicative only): Household

Disaggregated by: Social class and gender

2. Indirect effects Traffic, Transport and Access Outcome Indicators

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Quality of education (attainment, absenteeism, qualifications and commitment of teachers, availability of school supplies)
Data collection point (indicative only): School/community
Disaggregated by: Social class and gender
Quality of health facilities (qualifications of staff, availability of medical supplies)
Data collection point (indicative only): Health centre/community
Disaggregated by: Social class, age and gender
Prices (prices of key commodities, agricultural inputs, land)
Data collection point (indicative only): Household/community
Disaggregated by: Social class and gender
Impact on agricultural activities (crop mix, cultivated area, intensity, use of inputs, visits of extension agents)
Data collection point (indicative only): Household/community
Disaggregated by: Social class and gender
Impact on nonagricultural activities (activity mix, off-farm employment, trading, businesses)
Data collection point (indicative only): Household/community
Disaggregated by: Social class and gender
Income structure (type o income sources)
Data collection point (indicative only): Household
Disaggregated by: Social class and gender
Composition of Expenditure (Share of food, transportation)
Data collection point (indicative only): Household
Disaggregated by: Social class and gender
Health status (incidence of illness, number of work days due to illness, treatment strategy)
Data collection point (indicative only): Household
Disaggregated by: Social class and gender
Education status (literacy, average years of education)
Data collection point (indicative only): Household
Disaggregated by: Social class and gender
Social interaction (number of visits to other villages and cities,participation at social events)
Data collection point (indicative only): Household
Disaggregated by: Social class, age and gender
Political participation (number of visits by government officials, participation in community or political events)
Data collection point (indicative only): Household/community

Disaggregated by: Social class and gender

Transport Indicators Data Collection Tools

The first three tools are associated with measuring traffic outcome indicators, which precedes and predates any attempt to assess a rural transport impact. Intervention rationale indicates that if there are no traffic outcomes there can be no development benefit or impact since the former, through lower transport charges, drives the latter. This emphasises on transport charges rather than costs reflects the importance of transport services.

Traffic census and surveys

The data collection format of the traffic census varies by country and the organization carrying out the survey. The key characteristic of the census form has to provide a clear definition of the transport modes likely to be encountered in the survey. These should include intermediate means of transport and pedestrians as well, the latter are often differentiated by load carrying or not. It is common practice to break up the notation of the count at hourly intervals over a 12-hour day, starting when people are known to be moving. Impact evaluations should also undertake a survey of the traffic stream to ascertain the characteristics of each mode (who is travelling, for what purpose, cost of the journey, time taken, etc.). This will involve using sample surveys of transport operators and users to ascertain their characteristics. It might be possible to widen this to capture the economic status of those travelling in order to asses if the poor are affected by or benefiting from the intervention..

Road user satisfaction surveys

Road user satisfaction surveys (RUSS) are a relatively recent introduction to impact evaluations and they vary in their intensity and scope. Their origin lies in the institutional reforms that have separated policy setting and regulation from the execution of works and maintenance in the transport sector. More emphasis on “governance” and “accountability” was therefore placed with the new ministries, executive agencies, road funds, etc., and the resultant “service culture” seeks and responds to feedback from its “clients” i.e. the road users.

It is mostly used to-

- Measure customer satisfaction of road network outcomes or attributes through a few sets of major indicators (including all key performance indicators from the Project Appraisal Document), each with a number of sub-indicators.
- Measure customer perceptions of road sector development programs at federal/provincial levels through a few sets of major indicators, each with a number of sub-indicators.

Cordon surveys

Cordon surveys are targeted surveys on all access routes leading to a market, town or discrete area (a national park). Their objective is to survey all traffic entering or leaving the area around the point of interest. In transport terms, they are often used to build up a picture of traffic flows in an

urban area as part of the preparation of a master plan. In rural transport terms, they are occasionally used to assess traffic accessing an important rural market.

Community/household surveys

Community or household surveys usually serve to assess the indirect impact of a rural transport project. They rely on questionnaires or interview schedules to collect impact indicator data from the project area. Their function is to quantify the travel, transport and access characteristics of the household as well as its socioeconomic attributes by interviewing the main community and household decision makers.

The compilation of the questionnaire follows a number of principles as delineated in Table 6-2 below:

Table 3-2 Recommendations for the preparation of household survey questionnaires

- Phrase each question so that information it provides tests a hypothesis or quantifies an indicator that contributes to answering an evaluation question.
- Adopt a concentric approach i.e. beginning with the household then taking the respondent through a logical sequence of events that are interconnected and are likely to be remembered by association.
- The questionnaire should contain a mix of open and closed questions that allows the respondent to articulate his/her reasons rather than be obliged to use a preconceived framework of stock answers.
- Include one or more repetitive questions as a means of testing the reliability of the respondent's answers. Ideally, these questions should replicate those used by the Central Bureau of Statistics (CBS) in their Household Surveys and Demographic Health Surveys.
- Use tested questionnaires and adjust them to reflect the focus of the impact study as well as the social and cultural environment in which they will be applied. This adjustment process involves:
  - Fine –tuning the number of variables to the impact study area and time period envisaged between the baseline and follow-up survey. For example, the mix of "modern" farm inputs available in an impact area reflects current agricultural extension effort and advice on best practice. Similarly, government efforts to encourage free primary schools may affect the applicability of school enrolments as an impact indicator and might be replaced by a literacy variable if the follow up survey is planned for some 4 to 5 years after the Transport intervention.
  - If the objective of the evaluation is to estimate transport intervention's impact on poverty then it is essential that the questionnaire include income and expenditure/consumption data. Most questionnaires use of the letter, because it can be collected with lower measurement errors than household income. Others rely on surrogate welfare indicators such as asset holdings. In the latter case, the

▪ Availability of Living Standards Measurement Surveys (LSMS) would enable the researcher to validate the use of expenditure and asset data through correlation or regression analysis.
▪ The draft questionnaire should be pretested and piloted. Pretesting will involve translating it into the local languages and retranslating it back using different translators. This will help identify and eliminate poor phrasing and ambiguities as well as provide the researcher with cultural insights and an understanding of local courtesies needed to allay any interviewer resistance. At the end of this process, it may be possible to finalize the translation of the questionnaire and print it into the local language.
▪ It is important that methodological continuity is maintained by a detailed description of the randomization process, the location of the individual respondents or the timing and/or sequencing of the survey. This should be backed up by a map and GPS coordinates of the household and community locations.
▪ Anticipate attrition rates and compensate by increasing the number of respondent in the baseline. The follow study needs to check if attrition is neutral and does not affect the representativeness of the sample.

B. SUSTAINABLE DEVELOPMENT GOALS

Building on the relative success of the Millennium Development Goals (MDGs), Nepal has committed to pursuing and achieving the Sustainable Development Goals (SDGs) by 2030. The MDGs final status report recently published by the National Planning Commission (NPC) has found that most of the MDG targets have been achieved, some were partially achieved and there are some unfinished agendas. Moreover, during the MDGs period several progress reports were brought out showing the status of the goals, targets and indicators at the national aggregate level lacking disaggregation based on social groups, gender and geographical regions. However, neither the final progress report nor any other review reports have adequately assessed or evaluated the policies and programmes to find out what worked and what did not in the achievement of MDGs. Thus, it is necessary to address these gaps during the implementation, monitoring and evaluation process of the Sustainable Development Goals (SDGs).

While SDGs are an internationally agreed set of common development objectives these global ambitions are broadly aligned with the social, economic and environmental aspirations that Nepal has set for itself in its new constitution. The SDGs, therefore, are not just an international milestone, but they represent a set of solemn commitments made by the people of Nepal for shared progress. Implementation of ambitious agendas must always be preceded by careful analytical stocktaking and planning of financial, institutional and human resources and it is necessary for National Planning Commission to take lead in engaging a wide range of stakeholders to articulate

our priorities, estimate resource needs and suggest institutional prerequisites to help set the stage for an expedite implementation of the SDGs. The rigor with which the quantitative benchmarks have been set for dozens of development indicators will help coordinate and steer development efforts towards common, achievable ends and in order to gain that objective, transport infrastructure is one of the most indispensable sector which needs to be intervened.

The Sustainable Development Agenda rests on three pillars: **economic, social and environmental**. They also map the development narrative where Nepal's aspirations were structured around generating, sharing and sustaining prosperity leading up to 2030. The Millennium Development Goals (2001- 2015) were successful because they were time-bound, quantified and simple to monitor. However, on several issues, they did not go into the root causes of development. The SDGs are not just an enlargement of the MDGs in terms of the number of goals and targets, but they also seek to address complex issues like inequality and human rights. They take a more holistic approach to development. The ambition, however, is so high that several goals and targets needs to be seemed as aspirational.

As per NPC's report, the SDGs could be grouped into the following five clusters for a better conceptual appreciation as seen from Nepal's present development stage as:

Basic mark of civilization

There are four goals [1, 2, 6 and 7] which deal with the ending of poverty and hunger, and providing basic water, sanitation and modern energy for all citizens. Given the technologies on offer and the finance that is available, these goals set the bar for minimum requirements that every citizen around the world are entitled to. These set the physical standards for a basic mark of civilization in the 21st century.

Exercise of human capabilities and agency

Goals 3 and 4 deal with healthy lives, quality education and lifelong learning. They are ends of development in themselves, but are also the means for a more productive economy and a society that puts at the center the core capabilities of its citizens.

Higher human aspiration

Goals 5, 10 and 16 on achieving gender equality, reducing inequality, and securing peace, access to justice, inclusive institutions, respectively, resemble higher aspirations of modern, democratic nation-states. While complete equality or access may be difficult to pursue in a time-bound manner, they are goals worthy of pursuit on an ongoing basis.

Means for sustained progress

Goals 8, 9, 11 and 12 related to economic growth, jobs, resilient infrastructure, industrialization, cities and settlements, and sustainability of consumption and production are about generating and sustaining resources to improve the average quality of life and human dignity.

Threats to future prosperity

Goals 13, 14 and 15 deal with the protection of the global commons. From climate change to oceans and marine resources and forests, desertification, land degradation and biodiversity, they remind us that as economic growth is pursued and its benefits shared, the natural heritage of the planet need to be protected. Physical development ought not to be secured at an environmental cost.

The first three sets of goals above are mostly national in scope, but the latter two have a regional and global dimension. SDG 17 calls for strengthening the means of implementation and revitalizing global partnerships.

In the face of limited resources, a key challenge is to identify an implicit order of priorities for the numerous goals. The focus on the goals also need to be sequenced over the 12 to 15-year horizon, and then costed. A logical point to start is its inclusion in 15th Plan which should suggest the direction for annual budget priorities. The development issues to be identified therein must be related to the SDGs to varying degrees. Although all SDGs are important, indivisible, and common for all countries, their priorities are country specific. Preferences are, however, difficult to set by ranking the goals from 1 to 17. The targets and indicators embedded within the goals, however, do lend themselves to more explicit ranking and prioritization. The goals can be clustered thematically.

Areas of priority will also have to be sectors where the MDG agenda is still unfinished. Those goals that have the potential to trigger inclusive economic growth through job creation, strengthen social protection systems, and reduce disaster risks are also big priorities in today's Nepal. However, the SDGs are not stand-alone goals, and achievement of one goal has implications for the achievement of others. They are intertwined. For example, reduction of poverty depends on the reduction of hunger, gender disparities, outcomes in education and health, and environmental stresses.

It is important to focus on what specific policy instruments will the different goals demand? What follows are illustrative excerpts from a separate NPC study on needs assessment, costing and financing of SDGs. Take poverty reduction, possibly the most important challenge of this generation. How shall it be done? Informed by existing literature, the interventions include (i) income generation activities to directly solve "the problem of the last mile" and to serve the hard to-reach, (ii) concessional micro-credit, with subsidized interest to small and medium enterprises expected to generate jobs, (iii) location-specific infrastructure, (iv) prevention and mitigation of disasters which could worsen poverty, and (v) widening of social protection coverage.

The seventeen (17) basic goals which SDGs have envisaged can be outlined diagrammatically as below:

Fig 3-1: 17 Basic Goals of SDGs

After identifying and prioritizing major goals and targets, what is to be decided is the nature of intervention of policy instruments. Do these instruments entail capital investments, human resources, or simple stroke-of-the pen policy reforms? What kind of synergies and consistencies need to be sought or forged? What roles should be apportioned to the state, private sector and civil society? Will there be incentives for collaboration and partnership in pursuit of shared goals? Are they to be front-loaded or back-loaded?

In order to pragmatically achieve many of the proposed milestones, intervention in transport infrastructure is utmost and effective M&E system of it is pivotal. For effective monitoring of the outputs and outcomes, a Results Framework will also have to be devised. Beyond the financial outlay, SDG priorities also need to factor in the managerial, institutional and allied capacity constraints. There is a need to institutionalize a system that prioritizes individual projects on the basis of analysis, evaluation and evidence. An ambitious implementation of the SDGs demands a heightened culture of evidence-based policymaking through effective, efficient and pragmatic Monitoring and Evaluation System.

C. GENERATION AND USE OF HIGH-QUALITY EVIDENCE IN DEVELOPMENT DECISION-MAKING

To ensure useful measurement, it needs to be mobilised and focused on resources for relevant questions that matter in the real world, and pave the way for more-transparent research practices. It needs to be studied and reviewed that examine what works, for whom, why and at what cost.

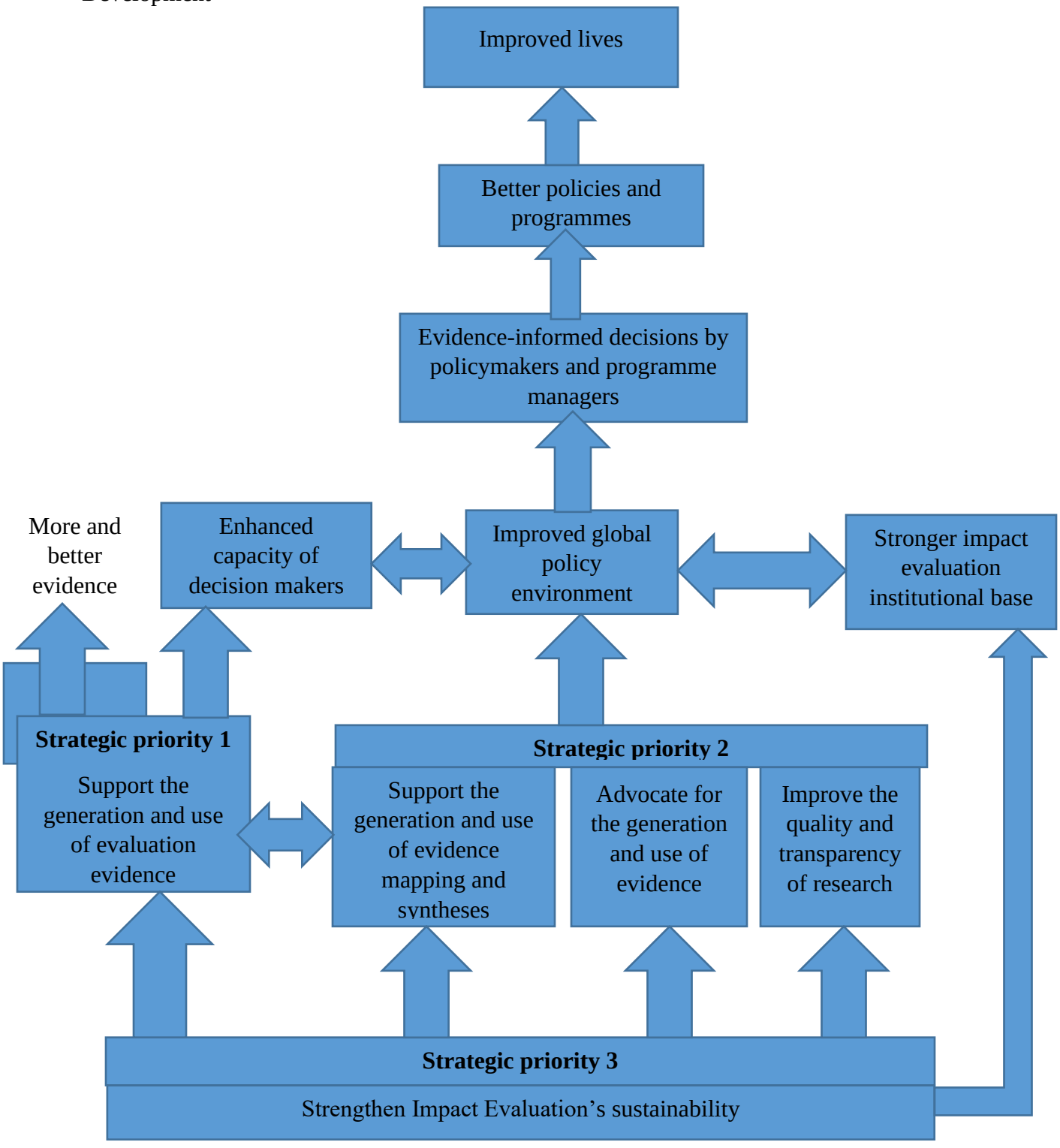
Thematically, most published impact evaluations are in agriculture, health, education and social protection. This does not mean these sectors are saturated – more needs to be done – but highlights that some sectors, such as energy, infrastructure, environment and humanitarian assistance, which receive a significant amount of public and private expenditure, need more focused attention. Similarly, few studies have carried out deep distributional analysis on the gendered effects of interventions on women and girls, vulnerable populations, the very poor or other marginalised groups.

Impact Monitoring and Evaluation Framework is essential in the following aspects:

- Carry out scoping work and develop informative evidence gap maps to focus investments in areas where rigorous primary evaluation studies or syntheses are missing or more are needed;
- Support the generation of equity- and gender-responsive evaluations and reviews that focus on understudied areas in rigorous and innovative ways;

- Monitor and measure stakeholder engagement of research teams and evidence uptake, and publish evidence use summaries;
- Support mapping and syntheses of existing evidence on the effectiveness of development interventions;
- Enhance evidence quality by promoting research transparency and accountability through replication and preregistration of impact evaluations;
- Convene stakeholders and facilitate conversations on important topics related to the generation and use of evidence;
- Build coalitions for evidence-informed decision-making by building links amongst researchers, implementers, policymakers, civil society members, donors and other key actors at country level and amongst the broader evaluation community and academia
- Deepen engagement and promote peer learning amongst the stakeholders
- Diversify the funding base and explore new donor partnerships
- Develop a demand-driven capacity building programme based on effective practices

Fig. 3-2: Generation of Impact Monitoring and Evaluation (M&E) for Contributing to Effective Development



4. Monitoring and Evaluation (M&E) Processes and Standards

Monitoring: This type of evaluation is performed while a project is being implemented, with the aim of improving the project design and functioning while in action.

Evaluation: An evaluation studies the outcome of a project (changes in income, road quality, benefits distribution, cost-effectiveness, etc.) with the aim of informing the design of future projects.

Inputs, Activities, Outputs, Outcomes and Impacts form the results chain, and each of these aspects need to be monitored. The new outcomes approach is placing more emphasis on the results (outcomes) of department's deliverables. Correct understanding and defining of the elements in the results chain with regards to the department's strategic objectives is essential to developing an M&E Plan which will produce useful data for management. As M&E develops further in the NPC, the department will define M&E concepts which are specific to their work and sector. This standardization is important for credible M&E Plans and such learning comes with continuous review.

Monitoring and evaluation need not be expensive or complicated, nor do they require specialists or grand calculations. The complexity and extent of the studies can be adapted to fit the program needs. The job of the project manager in this process is to point out those areas in need of monitoring or evaluation. If this is left to the researchers, the studies may tend to be too academic and not as useful to project management.

Evaluation and monitoring systems can be an effective way to:

Provide constant feedback on the extent to which the projects are achieving their goals.
Identify potential problems at an early stage and propose possible solutions.
Monitor the accessibility of the project to all sectors of the target population.
Monitor the efficiency with which the different components of the project are being implemented and suggest improvements.
Evaluate the extent to which the project is able to achieve its general objectives.
Provide guidelines for the planning of future projects (Bamberger 4).
Influence sector assistance strategy. Relevant analysis from project and policy evaluation can highlight the outcomes of previous interventions, and the strengths and weaknesses of their implementation.
Improve project design. Use of project design tools such as the log frame (logical framework) results in systematic selection of indicators for monitoring project

performance. The process of selecting indicators for monitoring is a test of the soundness of project objectives and can lead to improvements in project design.

Incorporate views of stakeholders. Awareness is growing that participation by project beneficiaries in design and implementation brings greater "ownership" of project objectives and encourages the sustainability of project benefits. Ownership brings accountability. Objectives should be set and indicators selected in consultation with stakeholders, so that objectives and targets are jointly "owned". The emergence of recorded benefits early on helps reinforce ownership, and early warning of emerging problems allows action to be taken before costs rise.

Show need for mid-course corrections. A reliable flow of information during implementation enables managers to keep track of progress and adjust operations to take account of experience (OED).

The Monitoring and Evaluation Framework shall include the following three tired structures:

Performance Monitoring

Performance Monitoring determines the progress of the transportation project implementation. It will be used to improve project management and identify problems in implementation. Performance monitoring will have two aspects: monitoring of activities and monitoring of processes, in terms of identification and prioritization of needs. It will be undertaken using the following indicators:

Maintenance programming milestones
Numbers of subprojects undergoing preparation
Timelines showing the subprojects preparation
Monthly, quarterly and annual progress reports from the respective department
Annual review of process for identifying and selecting subprojects.

Compliance Monitoring

Compliance monitoring will be used to ensure that project implementation follows prescribed policies and procedures. The Project M&E system will have to assess whether the project is following the guidelines by comparing against the following indicators:

Criteria relating to eligible subprojects
Financial management arrangements
Procurement arrangements
Environmental and Social Safeguard provisions

Impact Monitoring

The impact monitoring measures the extent to which the objective for which a certain transportation program has been enforced is achieved or not. This monitoring could also be undertaken through project impact evaluation and lessons learned from workshops. Impact monitoring will also include the quality aspect of delivery so that sustainability is ensured.

Good monitoring and evaluation design during project preparation is a much broader exercise than just the development of indicators. Good design has five components:

- Clear statements of **measurable objectives** for the project and its components, for which indicators can be defined.
- **A structured set of indicators**, covering outputs of goods and services generated by the project and their impact on beneficiaries.
- **Provisions for collecting data and managing project records** so that the data required for indicators are compatible with existing statistics, and are available at reasonable cost.
- **Institutional arrangements** for gathering, analyzing, and reporting project data, and for investing in capacity building, to sustain the M&E service.
- Proposals for the ways in which M&E findings will be **fed back into decision making**.

Examples

1. Project objectives

Projects are designed to further long-term sectoral goals, but their immediate objectives, at least, should be readily measurable. Thus, for example, a health project might be designed to further the sectoral goals of a reduction in child mortality and incidence of infectious diseases, but have an immediate, measurable objective of providing more equitable access to health services. Objectives should be specific to the project interventions, realistic in the timeframe for their implementation, and measurable for evaluation.
District Primary Education Project, for example, set out its objectives at the district level in clear statements linked directly to indicators: Capacity building: District sub-project teams would be fully functional, implementing sub-project activities and reporting quarterly on progress. In-service teams would be functioning, with augmented staff and equipment, providing support for planning and management, teacher in-service training, development of learning materials, and program evaluation. Reducing dropout and improving learning achievement: School/community organizations would be fully functional for at least half the schools, and dropout rates would be reduced to less than 10 percent. Learning achievements in language and mathematics in the final year of primary school would be increased by 25 percent over baseline estimates. Improving equitable access. Enrollment disparities by gender and caste would be reduced to less than 5 percent.

2. Indicators

Input indicators are quantified and time-bound statements of resources to be provided. Information on these indicators comes largely from accounting and management records. Input indicators are often left out of discussions of project monitoring, though they are part of the management information system. A good accounting system is needed to keep track of

expenditures and provide cost data for performance analysis of outputs. Input indicators are used mainly by managers closest to the tasks of implementation, and are consulted frequently, as often as daily or weekly.
Examples: vehicle operating costs for the crop extension service; levels of financial contributions from the government or cofinanciers; appointment of staff; provision of buildings; status of enabling legislation.

Process indicators measure what happens during implementation. Often, they are tabulated as a set of contracted completions or milestone events taken from an activity plan.
Examples: Date by which building site clearance must be completed; latest date for delivery of fertilizer to farm stores; number of health outlets reporting family planning activity; number of women receiving contraceptive counseling; status of procurement of school textbooks.

Output indicators show the immediate physical and financial outputs of the project: physical quantities, organizational strengthening, and initial flows of services. They include performance measures based on cost or operational ratios.
Examples: Kilometers of all-weather highway completed by the end of September; percentage of farmers attending a crop demonstration site before fertilizer top-dressing; number of teachers trained in textbook use; cost per kilometer of road construction; crop yield per hectare; ratio of textbooks to pupils; time taken to process a credit application; number of demonstrations managed per extension worker; steps in the process of establishing water users' associations.

A good performance indicator should be:

Reliable: the indicator should be accurate enough for its intended use and respond to changes in the level of performance.
Well-defined: the indicator needs to have a clear, unambiguous definition so that data will be collected consistently, and be easy to understand and use.
Verifiable: it must be possible to validate the processes and systems that produce the indicator Cost-effective: the usefulness of the indicator must justify the cost of collecting the data. *Appropriate*: the indicator must avoid unintended consequences and encourage service delivery improvements, and not just give managers incentives to carry out activities simply to meet a particular target.
Relevant: the indicator must relate logically and directly to an aspect of the institution's mandate, and the realization of strategic goals and objectives thereof.

Impact refers to medium or long-term developmental change. (Some writers also refer to a further class of outcome indicators, more specific to project activities than impact indicators, which may be sectoral statistics, and deal more with the direct effect of project outputs on beneficiaries.) Measures of change often involve complex statistics about economic or social welfare and depend

on data that are gathered from beneficiaries. Early indications of impact may be obtained by surveying beneficiaries' perceptions about project services. This type of leading indicator has the twin benefits of consultation with stakeholders and advance warning of problems that might arise. Examples of impact: (health) incidence of low birth weight, percentage of women who are moderately or severely anemic; (education) continuation rates from primary to secondary education by sex, proportion of girls completing secondary education; (forestry) percent decrease in area harvested, percent increase in household income through sales of wood and non-wood products. Examples of beneficiary perceptions: proportion of farmers who have tried a new variety of seed and intend to use it again; percentage of women satisfied with the maternity health care they receive.

3. Collecting Data and Managing Project Records

The achievement of project objectives normally depends on how project beneficiaries respond to the goods or services delivered by the project. Evidence of their response and the benefits they derive requires consultation and data collection that may be outside the scope of management. It is important to identify how beneficiaries are expected to respond to project services, because managers will need evidence of that response if they are to modify their activities and strategy. Indications that beneficiaries have access to, are using, and are satisfied with project services give early indication that the project is offering relevant services and that direct objectives are likely to be met. Such evidence - market research - may be available sooner and more easily than statistics of impact such as changes in health status or improvements in income. Market research information is an example of a leading indicator of beneficiary perceptions that can act as a proxy for later, substantive impact. Other leading indicators can be identified to give early warning about key assumptions that affect impact. Examples would include price levels used for economic analysis, passenger load factors in transport projects, and adoption of healthcare practices. When planning the information needs of a project there is a difference between the detail needed for day-to-day management by the implementing agency or, later, for impact evaluation, and the limited number of key indicators needed to summarize overall progress in reports to higher management levels.

For example, during construction of village tubewells, project managers will need to keep records about the materials purchased and consumed, the labor force employed and their contracting details, the specific screen and pump fitted, the depth at which water was found, and the flow rate. The key indicators however, might be just the number of wells successfully completed and their average costs and flow rates.

Exogenous indicators are those that cover factors outside the control of the project but which might affect its outcome, including risks (parameters identified during economic, social, or technical analysis, that might compromise project benefits); and the performance of the sector in which the project operates. Concerns to monitor both the project and its wider environment call for a data collection capacity outside the project and place an additional burden on the project’s

M&E effort. A recent example of a grain storage project in Myanmar demonstrates the importance of monitoring risk indicators. During project implementation, policy decisions about currency exchange rates and direct access by privately owned rice mills to overseas buyers adversely affected the profitability of private mills. Management would have been alerted to the deteriorating situation had these indicators of the enabling environment been carefully monitored. Instead, a narrow focus on input and process indicators missed the fundamental change in the assumptions behind the project. The relative importance of indicators is likely to change during the implementation of a project, with more emphasis on input and process indicators at first, shifting to outputs and impact later on. This is a distinction between indicators of implementation progress and indicators of development results.

Data collection Project field records. Indicators of inputs and processes will come from project management records originating from field sites. The quality of record keeping in the field sets the standard for all further use of the data and merits careful attention. M&E designers should examine existing record-keeping and the reporting procedures used by the project authorities to assess the capacity to generate the data that will be needed. At the same time, they should explain how and why the indicators will be useful to field, intermediate, and senior levels of project management. The design of field records about, say, farmers in extension groups, people attending a clinic, or villagers using a new water supply, will affect the scope for analysis later. The inclusion of simple socioeconomic characteristics such as age and sex may significantly improve the scope for analysis. A good approach is to structure reporting from the field so that aggregates or summaries are made at intermediate stages. In this way, field staff can see how averages or totals for specific villages or districts enable comparisons to be drawn and fieldwork improved.

Surveys and studies. To measure output and impact may require the collection of data from sample surveys or special studies (including, where appropriate, participatory methods). Studies to investigate specific topics may call for staff skills and training beyond those needed for regular collection of data to create a time series. Where there is a choice, it is usually better to piggyback project-specific regular surveys on to existing national or internationally supported surveys than to create a new data collection facility. Special studies may be more manageable by a project unit directly, or subcontracted to a university or consultants. If the special studies are to make comparisons with data from other surveys it is vital that the same methods be used for data collection (see below). In the project plan, proposals to collect data for studies should include a discussion of: the objectives of the study or survey; the source of data; choices and proposed method of collection; and likely reliability of the data.

Data comparability. Some desired indicators of impact, such as mortality rates, school attendance, or household income attributable to a project, may involve comparisons with the situation before the project, or in areas not covered by the project. Such comparisons may depend on the maintenance of national systems of vital statistics, or national surveys. Before data from

such sources are chosen as indicators of project impact the designer needs to confirm that the data systems are in place and reliable and that the data are valid for the administrative area in question and for any control areas. Potential problems in making comparisons with existing data include incomplete coverage of the specific project area; the use of different methods to collect data, such as interviewing household members in one survey and only household heads in another; and changes in techniques such as measuring crop output in one survey and collecting farmers' estimates in another. Problems such as these can invalidate any comparison intended to show changing performance. To give the comparability needed for evaluation, study proposals should explain and justify the proposed approach and ensure consistency in methods. The complexity of the statistics and problems of attributing causality mean that often it is more appropriate to use the delivery of services and beneficiary response as proxy indicators than to attempt to measure impact.

Participatory methods of data collection can bring new insights into peoples' needs for project planning and implementation, but are no less demanding on skills than questionnaire surveys. They are time-consuming and require substantial talent in communication and negotiation between planners and participants.

4. Institutional arrangements; capacity building

In case of donor funded projects, good M&E should develop the capacity of the borrower and build on existing systems. Capacity building is widely acknowledged to be important but is often poorly defined. It means: upgrading skills in monitoring and evaluation, which include project analysis, design of indicators and reporting systems, socioeconomic data collection, and information management; improving procedures, to create functional systems that seek out and use information for decisions; and strengthening organizations to develop skilled staff in appropriate positions, accountable for their actions.

5. How Monitoring and Evaluation Findings Can Be Fed Back into Decision Making

In projects where operating performance standards are quoted as an objective, or where decentralized processes call for localized capacity to plan and manage work programs and budgets, designers will need to describe how and when M&E findings will be used to shape work plans and contribute to program or policy development. In Mexico, for example, the Second Decentralization and Regional Development Project plans to incorporate monitoring of implementation into its regular management procedures. Annual plans are to be prepared for each component, including an element of institutional development, and these will form the basis of annual monitoring. The analysis of implementation will depend on the functioning of a central database about sub-projects, created in each state from standardized data sheets. The database will produce the reports required for the project approval procedures, giving an incentive to field staff to use the system. Results

from the implementation database will be analyzed in order to target field reviews and a mid-term review. The project has no specific monitoring and evaluation unit. Instead, each management sub-unit responsible for technical oversight of a component is responsible for ensuring the quality and timeliness of data collection, and for producing and analyzing reports. These reports will be presented by project component and be used to help diagnose technical and institutional implementation issues, propose and conduct studies, and plan institutional development and training.

Experience with Implementation

Even with a good design for M&E, in case of donor funded projects, the World Bank's experience shows that success during implementation depends heavily on a sense of ownership by the borrower, adequate capacity in borrower institutions, and sustained interest from the task and project managers throughout the life of the project. Two factors are important here. One is that the borrower's sense of ownership of the project provides a stimulus to transparent management and good information about progress. The other is that often borrowers doubt the value of adopting what may be costly and time consuming procedures to collect, analyze, and report information. In such circumstances sound design is especially important, with monitoring information providing a clear input to management decision making and, often, an emphasis on the early gains to be had from monitoring and on institutional procedures that encourage the use of monitoring data to trigger further implementation decisions.

In a nutshell, while executing each individual programme or project evaluation, the following steps should generally be followed:

- ***Engagement with stakeholders*** to define the programmes/projects or other interventions to be evaluated and the specific performance questions to be evaluated. These stakeholders would include Senior Management in the Department, partners involved in programme delivery, those served or affected by the programme (e.g. beneficiaries) and other parties who have an interest in what will be learnt through the evaluation.
- ***Planning and designing the evaluation:*** Each intended evaluation will have to adhere to the M&E principles outlined above and have a detailed programme or project evaluation plan
- ***Conducting the evaluation:*** This includes assembling evaluation evidence through methodologically sound collection of credible data using various methods: qualitative or quantitative, experimental, observational or some mixture of the above. It also includes analysis of the data and the justification of evaluation conclusions/findings in relation to the evidence. The evaluation report should present a complete, fair and impartial assessment based on defensible information. The report should be timely, clear and user friendly.

- ***Sharing lessons learnt and follow-up***: The findings of evaluation processes should be communicated in ways that will be easily understood and acted upon by stakeholders. Follow-up should be done to see if policy, programme or project design and implementation take evaluation findings into account.

5. Monitoring and Evaluation (M&E) Framework

A. Conceptual Framework (Theoretical or Causal Framework):-

Diagram that identifies and illustrates the relationships between all relevant systemic, organizational, individual, or other salient factors that may influence program/project operation and the successful achievement of program or project goals.

Purpose:

- To show where program fits into wider context
- To clarify assumptions about causal relationships
- To show how program components will operate to influence outcomes
- To guide identification of indicators
- To guide impact analysis (causal pathways)

B. Results (Strategic) Framework:

Diagram that identifies steps or levels of results and illustrate the causal relationships linking all levels of a program's objectives. Results or strategic frameworks are a useful tool for identifying and illustrating the focal points of a project for monitoring and evaluation: the results. A results framework diagrams the relationships between the incremental **results** of the key activities all the way up to the overall objective or goal of the intervention.

It mainly focusses on developing a framework focused on program results **clarifies the points at which results can be monitored and evaluated**. In addition, results frameworks clearly **depict the causal relationships** that the project design assumes will connect.

Purpose:-

- Provides a clarified focus on the causal relationships that connect incremental achievement of results to the comprehensive program impact
- Clarifies project/program mechanics and factors' relationships that suggest ways and means of objectively measuring the achievement of desired ends

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Table 5-1 RESULTS FRAMEWORK AND MONITORING for RURAL ROADS

Project Development Objective (PDO):

To enhance the availability and reliability of transport connectivity for all communities.

PDO Level Results Indicators*	Core	Unit of Measure	Baseline	Cumulative Target Values**					Freq.	Data Source/ Method	Responsibility for Data Collection	Description (indicator definition etc.)
				Y1	*Y2*	*Y3*	*Y4*	*Y5*				
PDO 1: Increased access to all weather transport connectivity		Percentage of population within 2 and 4 hours walking distance in the participating *terai and hills* districts respectively from an all-weather road	0%			2%		4%	Mid-term and End-project	GIS Analysis of data provided by the project	Public Department	Percentage increase above Y0 baseline initially provided
PDO 2: Improved reliability of transport infrastructure		Percentage of core road networks in participating districts rated in "good" or "fair" condition.	0%	10%	20%	30%	40%	50%	Annual	Project report	Public Department	Percentage increase above Y0 baseline initially provided
INTERMEDIATE RESULTS												
Intermediate Result (Component A): Support to respective implementing and executing departments in institutional strengthening and beneficiary monitoring of physical works												
Intermediate Result indicator One: Improved maintenance planning		Annual Road Maintenance Plan being prepared and under implementation							Yearly	Project report	Public Department	Number of ARMPs being implemented acceptable to the department
Intermediate Result indicator Two: Improved transparency and accountability in the implementation of physical works		Beneficiary monitoring mechanisms being implemented							Yearly	Project report	Public Department	Number of projects with formal system, acceptable to department, in place for beneficiary

PDO Level Results Indicators*	Core	Unit of Measure	Baseline	Cumulative Target Values**					Freq.	Data Source/ Method	Responsibility for Data Collection	Description (indicator definition
				Y1	*Y2*	*Y3*	*Y4*	*Y5*				
Intermediate Result indicator Three: Improved quality of civil works		Material testing laboratories under effective use that meet the standards							Yearly	Project report	Public Department	Number of laboratories rated by department as moderately satisfactory or better according to specified
Intermediate Results (Component B): Maintenance and upgrading of transport infrastructure.												
Intermediate Result Indicator One: Rehabilitation and upgrading of roads to all-weather standards		km of roads upgraded/ rehabilitated							Yearly	Project report	Public Department	km of roads upgraded or rehabilitated
Intermediate Result Indicator Two: Improved periodic maintenance of roads		km of maintainable roads undergoing periodic maintenance							Yearly	Project report	Public Department	Summation of Maintenance Performance
Intermediate Result Indicator Three: Improved routine maintenance of roads		km of maintainable roads undergoing routine maintenance annually							Yearly	Project reports	Public Department	Annual summation of MPI-2

PDO Level Results Indicators*	Core	Unit of Measure	Baseline	Cumulative Target Values**					Freq.	Data Source/ Method	Responsibility for Data Collection	Description (indicator definition
				Y1	*Y2*	*Y3*	*Y4*	*Y5*				
Intermediate Result Indicator Four: New or rehabilitated crossing structures on road network		Meters of new / rehabilitated crossing structures							Yearly	Project report	Public Department	Meters of bridges and causeways constructed or rehabilitated
Intermediate Result Indicator Five: Improved periodic maintenance of crossing structures		Meters of maintainable crossing structures on roads undergoing periodic maintenance							Yearly	Project report	Public Department	Summation of MPI-3 and MPI-4
Intermediate Result Indicator Six: Improved routine maintenance of crossing structures		Meters of maintainable crossing structures undergoing routine maintenance annually							Yearly	Project reports	Public Department	Annual summation of MPI-5

C. Logical Framework:

It is one of the best methods for setting up a monitoring and evaluation system which helps define the basic assumptions on which the project design and implementation systems are based.
It monitors the following logical sequence of activities-
If
certain inputs are used effectively
then
certain **outputs** will be produced
if
the **outputs** are produced
then
certain **impacts** will be achieved.
For example:
Using LOGFRAME to monitor and evaluate the impacts of a road on women
If
roads are upgraded, then,
women will take more agricultural produce to market, then,
household income will increase and women's economic status will improve.

Table 5-2: General Conceptualization of Logical Framework Matrix (LFM)

Project Description	Performance Indicators	Means of Verification	Assumptions
Goal: The broader development impact to which the project contributes - at a national and sectoral level.	Measures of the extent to which a sustainable contribution to the goal has been made. Used during evaluation.	Sources of information and methods used to collect and report it.	
Purpose: The development outcome expected at the end of the project. All components will contribute to this	Conditions at the end of the project indicating that the Purpose has been achieved and that benefits are sustainable. Used for project completion and evaluation.	Sources of information and methods used to collect and report it.	Assumptions concerning the purpose/goal linkage.

Component Objectives: The expected outcome of producing each component's outputs.	Measures of the extent to which component objectives have been achieved and lead to sustainable benefits. Used during review and evaluation.	Sources of information and methods used to collect and report it.	Assumptions concerning the component objective/purpose linkage.
Outputs: The direct measurable results (goods and services) of the project which are largely under project management's control	Measures of the quantity and quality of outputs and the timing of their delivery. Used during monitoring and review.	Sources of information and methods used to collect and report it.	Assumptions concerning the output/component objective linkage.
Activities: The tasks carried out to implement the project and deliver the identified outputs.	Implementation/work program targets. Used during monitoring.	Sources of information and methods used to collect and report it.	Assumptions concerning the activity/output linkage.

Table 5-3: Typical Road Improvement Logical Framework Matrix

Overall Objective:-

Intervention logic:

To contribute to poverty reduction by provision of sustainable access combined with income generation through synergies with other donor interventions, primarily in the education, economic and agriculture sector

Objectively verifiable indicators:

Poverty Reduction Strategy (PRS) objectives achieved and 5000 km roads to be reconstructed by 2030.

Source of Verification:

Monitoring Reports.

90-Day action Plans Results & progress report on PRS Implementation.

Program Purpose:-

Intervention logic:-

Improved road accessibility

(a) Enabling more agriculture produce to reach markets;

(b) Facilitating improved social services particularly in the health and education sector

(c) Creation of income earning opportunities for men and women in the rural areas.

Objectively verifiable Indicators:
Incomes from farm & non-farm activities increase by 60% over life project.
Population living along roads have year round access to health and other social services.
1,000 worker days per kilometer of road created with 40% taken up by women.

Sources of verification:-
Baseline and follow up Evaluation of project.
Concerned department, project and contractor employment records by gender.
Project semi-annual and annual reports.

Important Assumptions:-
PRS reporting is effective.
The contractors are willing to employ local labour as much as possible and pay on time.
Concerned department maintain primary and secondary network in project counties.
Concerned department retains functional responsibility for strategic/local road network.

Outputs 1:-
Intervention logic:
Rehabilitation and maintenance of strategic/local roads in the counties of *** and ***.
Objectively verifiable indicators:-
3000 km of strategic/local roads rehabilitated and brought to a maintainable standard by Labor-intensive methods in ****and****counties.
Routine maintenance carried out by labor-intensive methods on completed project roads.
Sources of verification:
Project Quarterly Reports.
Road maintenance contracts awarded by Concerned Department Engineer in *** and **** counties.
Important assumptions:
Suitable contractors available.
Contractors complete the work on time.

Outputs 2:-
Interventions logic:
Improved capacity in the public and private sectors to rehabilitate and maintain roads.
Objectively verifiable
20 concerned department staff, 10 contractors and 30 communities trained
Indicators:
Road reconstruction and maintenance contracts completed in a timely, cost effective manner
Sources of verification

Training reports and evaluations.
Site visits and supervision reports.
Important assumptions:
Suitable and motivated staff available.

Outputs 3:-

Intervention logic:
A foundation laid for a government strategy and donor coordinator for a nationwide roads program.
Objectively verifiable:
Feeder Road Design Standards and Specifications disseminated
Indicators:
Maintenance Management system for the routine maintenance of feeder roads established.
Concerned department donor co-ordination improved.
Sources of verification:
Strategic/Local Road Design Standards and Specifications manual applied to other Projects.
Routine maintenance management applied to project roads.
Minutes of donor coordination meetings.
Important assumptions:
Concerned department develops and staffs an appropriate organizational structure.
Concerned department develops a donor coordination facility.

Outputs 4:-

Intervention logic:
Potential adverse project impacts from land take, environmental damage are minimized
Objectively verifiable:
Environmental management plans to be incorporated in road reconstruction contracts.
Provision for health and sanitation awareness is incorporated into contract documents
Sources of verification:
Road Construction Contract Documents.
Health and sanitation information disseminated at work sites
Important assumptions:
Contractor/Concerned department should be sensitive to environmental and health/sanitation concerns.

Activities:-

Intervention logic:

The core activities encompass all measures for rehabilitating and maintaining strategic/local roads (selection, design, procurement of contractors and communities, supervision and certifying works for payment.
On-the-job training of concerned department counterparts, contractors and communities will be an integral part of preparations, procurement and implementation.
Supplementary training theoretical courses will be provided in co-operation with donor agencies for the various categories of concerned department staff, contractors and communities

Objectively verifiable indicators
The correct Engineers Estimation and BoQ prepared. Design drawing works done. Effective bidding, evaluation and awarding of contracts done. Concerned department ensure supervision and certify payments to contractors and community people.
Concerned department staffs are able to carry out the tasks.
Training materials prepared and recoded with all concerned stakeholders.
Sources of verification:
All documents are archived.
Project quarterly reports.
Reports on imparted training are prepared and annexed with project quarterly reports
Important assumptions:
Concerned department staffs are assigned to perform the tasks

D. Logic Models:-

Logic models are also known as M&E frameworks and are sometimes referred to as logical frameworks. In general, the logic model is similar to a logical framework, but it is presented differently. It is a diagram that identifies and illustrates the linear relationships flowing from program inputs, processes, outputs, and outcomes. Inputs or resources affect processes or activities which produce immediate results or Outputs, ultimately leading to longer term or broader results, or outcomes.
The purpose of logic models is to present a clear plan for the use of resources to meet the desired goals and objectives. They are a useful tool for presenting programmatic and evaluation components. An underlying assumption of logic models is that there is a linear relationship flowing from program inputs to processes/activities, which, in turn, result in outputs that ultimately lead to long-term outcomes and impact. Inputs, processes and outputs pertain to what the program does while outcomes and impact pertain to what the program sets out to accomplish.
Purpose:

- Provides a streamlined interpretation of planned use of resources and desired ends
- Clarifies project/program assumptions about linear relationships between key factors relevant to desired ends

Logic models are valuable tools for:

- **Programme Planning and Development:** The logic model structure helps think through your programme strategy—to help clarify where the programme is and where the programme should be.
- **Programme Management:** Because it "connects the dots" between resources, activities, and outcomes, a logic model can be the basis for developing a more detailed management plan. Using data collection and an evaluation plan, the logic model helps track and monitor operations to better manage results. It can serve as the foundation for creating budgets and work plans.
- **Communication.** A well-built logic model is a powerful communications tool. It can show stakeholders at a glance what a programme is doing (activities) and what it is achieving (outcomes), emphasizing the link between the two.

Table 5-4: General Conceptualization of Logical Model

Logic Model Component	Description
Inputs	The resources we invest in an intervention
Processes	The activities carried out in order to achieve the intervention's objectives
Outputs	The immediate RESULTS achieved by the intervention at the intervention level through the execution of activities
Outcomes	The set of results at the (target) population level induced by the interventions. People level effect
Impacts	The long term effects or end results of the intervention eg. changes in health status

Fig: 5-1 Sequential Steps in Logic Model

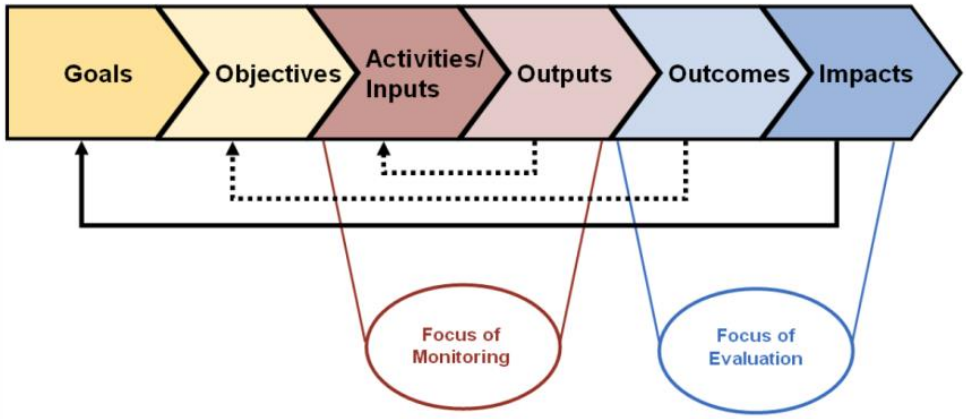
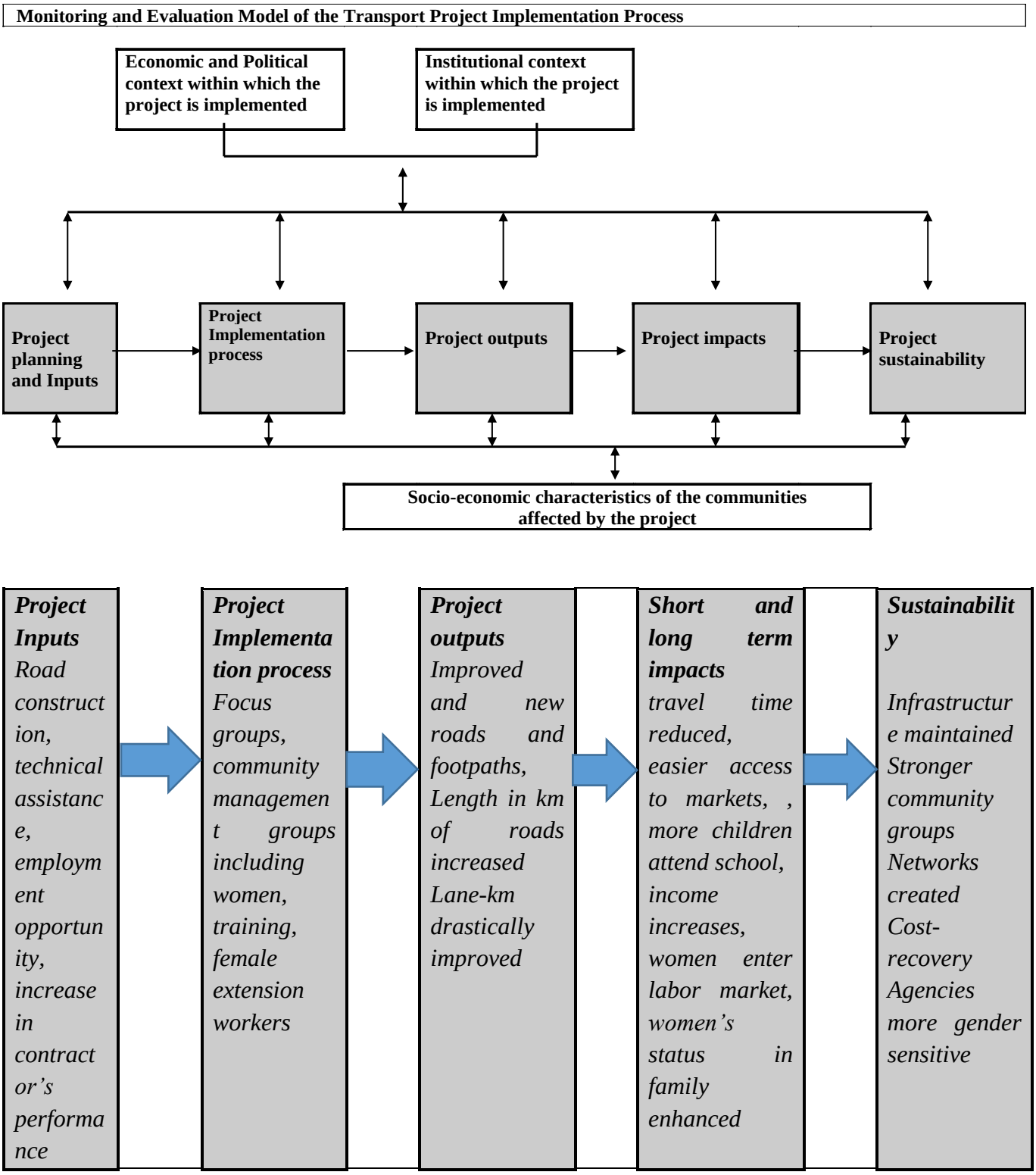


Table 5-5: Monitoring and Evaluation Model of the Transport Project Implementation Process



Planning and Inputs:

- Stakeholder groups consulted
- Funds approved and available
- Equipment available

Implementation Process:

- All community included in planning and implementation
- Targets set for women representatives

Outputs:

- Local organizations established at district level
- Km. Roads constructed/ upgraded

Impacts:

- Increased household income
- Higher proportion of girls attending school
- Increased agricultural production
- Wider range of goods available in villages

Sustainability:

- Community labor for road maintenance
- Cash payments for road maintenance
- Condition of roads 1, 2 and 5 years after construction

Fig: 5-2 Diagrammatic Representation of Logic Model Components

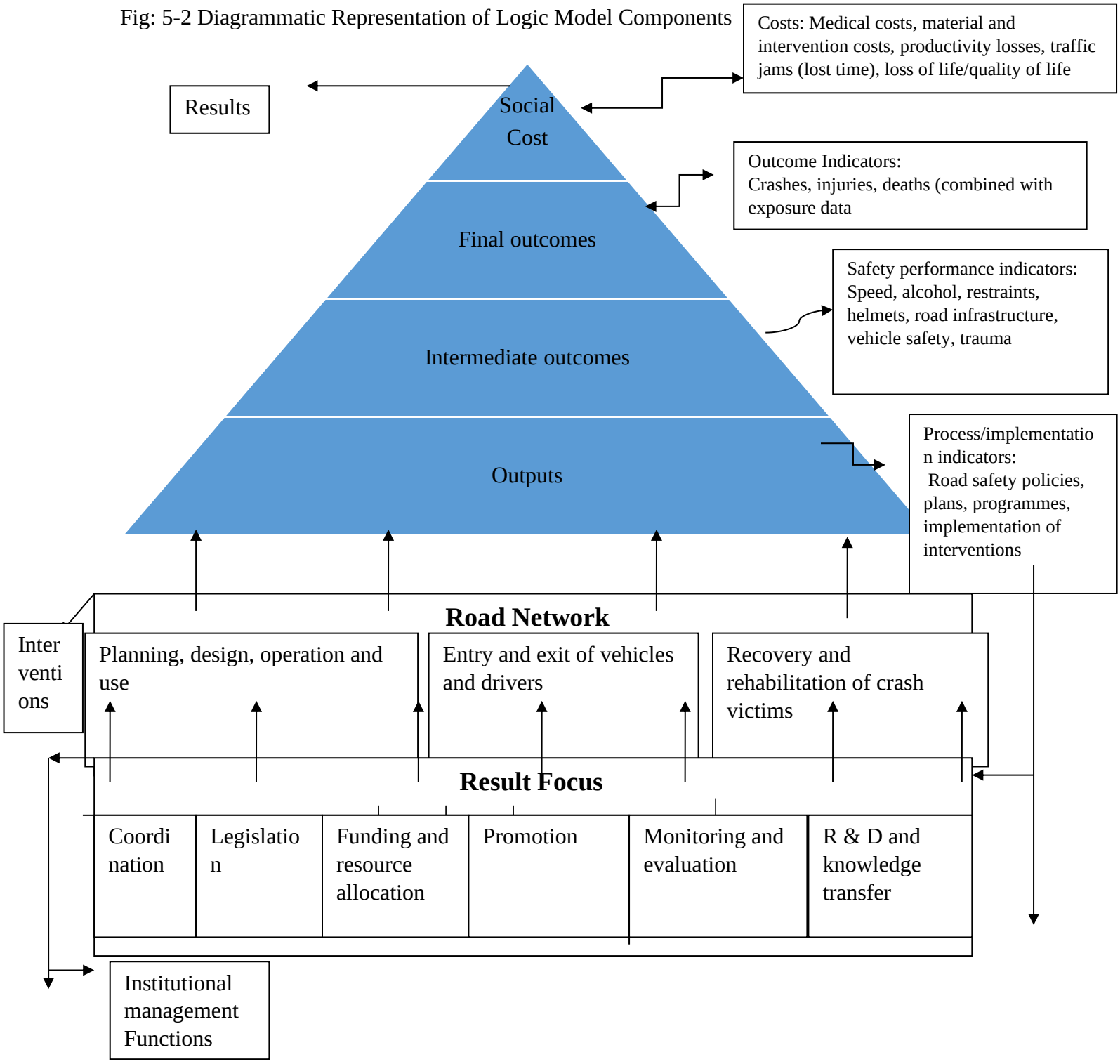


Table 5-6: Basic Comparison among the M&E Framework Components

Type of Framework	Brief Description	Program Management	Basis for Monitoring and Evaluation
Conceptual	Interaction of various factors	Determine which factors the program will influence	No. Can help to explain results
Results	Logically linked program objectives	Shows the causal relationship between program objectives	Yes – at the objective level
Logical	Logically linked program objectives, outputs, and activities	Shows the causal relationship between activities and objectives	Yes – at the output and objective level
Logic model	Logically links inputs, processes, outputs, and outcomes,	Shows the causal relationship between inputs and the objectives	Yes – at all stages of the program from inputs to process to outputs to outcomes/ objectives

6. Key Principles and Steps for Effective M&E of Transportation Effects/Impacts with Methodologies

Monitoring and Evaluation (M&E) has been an important feature of transport projects over the last decades but was concerned with progress and performance monitoring as a means of reporting to sector ministries, government and development partners. Impact assessments, where they have been part of this reporting effort, have tended to be of low priority in the management push to mobilize and implement physical works. This has affected the resultant validity and reliability of impact assessment. Generally, project management finds it easier to organize and support baseline studies than fund and support follow up surveys. This weakness was recognized as early as 1984, when Howe noted in his review of road impact literature that not one completed study has been based on the long term monitoring of project-induced change.

Since then there has been considerable changes in the level of funding and techniques used to evaluate interventions, but there is still surprisingly little hard evidence on the size and nature of road improvement benefits, or their distributional impacts.

There has been a gradual recognition among those involved in implementing transport programs that the impacts of their efforts in the subsector are not well documented. There is a lack of evidence on both the development impacts of improvements and more importantly, the benefits they bring to the economic status of the poor. This knowledge gap is mainly due to methodological weaknesses of impact studies in the transportation development projects. This weakness begins before the project starts when they fail to undertake baseline data collection in both suitable control and treatment areas. It continues in the analysis of data, which assumes the autonomous nature of road impacts, overlooking the importance of road access in the investment and planning decisions made by other sectors, NGOs and entrepreneurs. Likewise, the traffic and transport focus of these studies has tended to gloss over the fact that “the poor and very poor inhabit a localized, walking world, and as such make little use of medium or long distance transport links”

Key Principles

Government/Sector interest in impact evaluation

Terminology: The OECD-DAC (2004) definitions of impact seem the most widely used and appropriate in regard to definitions and terminologies used in impact studies.
Commitment: There has to be a strong government and sector interest in the need for and commitment to a transport impact evaluation. A number of factors influence this commitment:

- A conducive policy environment is necessary. The findings of the evaluation are much more likely to be used if they address current policy concerns and implementation

priorities.

- The evaluation should be launched when decision-makers have clearly defined information needs. The findings must be ready in time to affect decisions, and key results communicated informally before the final report is completed.
- An evaluation is one part of an information stream that influences policy makers and sector programs. The evaluation needs to reflect the context in which it will be used, the program being justified for poverty or road access reasons

Involvement: There is now an onus on development partners to follow country systems and strengthen capacity to carry out evaluations as part of normal administrative, sector and governance functions asking "what works? and for whom?" This favors the involvement of governments, country statistics offices and university staff in joint evaluations and participatory approaches. This in turn requires to re-examine governmental data access policies and work with development partners to their mutual benefit

Execution of the evaluation: The evaluation may be carried out in many ways. The more common ones are listed below, but before the decision is made, it might be appropriate to undertake an initial diagnostic study to understand the context in which the evaluations will be conducted. It is needed to assess the resources and capacity of the likely organizations involved, the nature of the program(s) to be evaluated; the kind of issues to be addressed; and the likely approaches that will be required. A decision has also to be made as to how the services are to be managed and procured, four possible approaches stand out:

(a) The evaluation is conducted by the M&E unit of the sector or subsector managing the project: This usually has the advantage of better access to the key stakeholders, secondary data along with a better understanding of the political and organizational context within which the evaluation is taking place. However, sector M&E is usually focused on progress and performance monitoring which has a strong engineering and contractual bias limited capacity in statistical/econometric techniques, which will need to be addressed by appropriate technical assistance and support. The evaluation will have difficulty maintaining its independence since the evaluation team is invariably affected by the politics of both the ministry and government of the day and may find it difficult to explore sensitive areas.

(b) The evaluation is conducted by a national organization or body (NPC, university, research organization): In theory, this approach will still have access to key stakeholders, to secondary data, etc. but in reality, this may be hampered by the "silo" thinking that characterizes most civil service organizations. Nevertheless, the evaluation will be independent, will bring in experience from other sectors and databases and be able to explore sensitive issues such as local political pressures or the exclusion of vulnerable

groups. However, capacity constraints due to the selective out-migration of the more able researchers and technical assistance might be needed to address this.

(c) *Evaluation services with the appropriate mixture of national and international consultants are procured and managed by the sector:* This is the more common approach to address the capacity and resource weaknesses of the earlier approaches but information asymmetry makes it difficult to manage the contract. Thus, technical assistance may be needed to prepare terms of reference and contract documents and evaluate the tenders as well as monitor performance and peer review the analysis and findings.

(d) *The evaluation is led by the development partners supporting the sector who take full responsibility for the approach and findings:* This approach is likely to produce the best product but limited involvement of stakeholders and partial knowledge transfer encourage dependency and a status quo.

Communication: An effective communication between the evaluation team and the client in reporting the progress and findings of the evaluation is necessary. The client should have confidence in the team. They in turn need to establish a good relationship with the client and key stakeholders, understand their needs to avoid surprises when the findings are reported. It is also important that results be presented in a user-friendly format.

Scope of the evaluation: It is possible to ask a wide range of questions in an impact study and there is a wide range of quantitative and qualitative techniques that can be used to answer these questions. This means that the client has to exercise some discipline and make sure that the right questions are asked and Client/Development Partners/Technical Assistance with the evaluation team resist the temptation to widen or broaden the scope of the evaluation. Evaluations that collect too much data analyzed in an unfocused way often fail to produce useful results—even when they are methodologically sound.

Budget: Based on national and international practices, the cost of impact studies is estimated to range from "$200,000 to $900,000 depending on program size, complexity and data collection". The largest and most expensive are the "gold standard" RCT-based studies. Such expenditure exceeds the normal budgetary provision for M&E in most funding agencies—ILO allows a minimum of 2% of total project funds to be set aside for independent evaluations and 3% for reviews, monitoring and internal evaluations. Special budget provision has to be prepared and its value assessed, like any other project or program expenditure, in terms of its cost effectiveness or value for money. Most development partners funding rural transport projects to date seem unconvinced that a RCT-based gold standard study is cost effective and have focused on the well-trafficked road network where outcome traffic-based impact studies can deliver acceptable rates of return.

Elapsed time and timing of surveys: Impact studies have a minimum of two and possibly three stages in their execution. . Each stage has its own characteristics and difficulties but all need to be organized in the same way, with the same tools and seasonal timeframe. This suggests that there

should be a long-term relationship/partnership and trust between the agency contracting the impact evaluation and those charged with carrying out the work.

The first baseline or benchmark stage is the most critical in this regard. The mobilization of fieldwork sets the timing of the study. The baseline also sets out the impact methodology and the scale and direction of the data collection effort before the rural transport project begins implementing the physical works. Invariably, the project management is focused on planning and executing these works and the danger is that the resource needs and importance of the baseline are neglected. The project logical framework can be vital in this regard. If it sets explicit welfare goals as well as traffic and access outcomes, management is obliged to recognize that the project's contribution to goal achievement may need to be addressed. Usually, this involves a dialogue between project management, its funding agency and its counterpart subsector ministry to decide the approach and resources needed to identify and procure an appropriately qualified impact research team (see Section Execution of the evaluation above). If the record of successful impact studies is anything to go by, this dialogue or resource constraints have favored short-term outcomes.

The timetabling of the outcome surveys is usually in the last year of the project or immediately after its completion. The purpose of the surveys is to assess the project effects—by asking if the traffic and access objectives have been met and what are the short-term changes to household and community access and welfare. A positive finding at this stage is a precondition for the achievement of any welfare goals that are the long-term impact.

The final follow up survey is scheduled at least 5 years after the project completion to capture all its welfare impacts with a concomitant emphasis on household and community data (ADB, 2011). There is no agreement on the exact timing of this stage as it relies on the emergence of behavioral and agricultural changes that reflect household investment decisions and demand adjustments. However, the review of the impacts that have been applied suggests that attrition, unforeseen shocks and spillover effects from other or parallel projects affect both the data sources and the integrity of the quasi experimental design in the longer term IEs.

Methodology: The adopted methodology is the outcome of a dialogue between project management, the funding agency and counterpart subsector ministry along with the budget constraints outlined in the previous section. This approach has favored the adoption of quantitative methodologies to evaluate projects by identifying transport cost savings enjoyed by road users. Thus, many project logical frameworks specified traffic or access changes as objectively verified indicators with a supplementary expectation that there will be a similar reduction in transport charges. Access indicators associated with attendance and use of markets, health centers, schools, etc. might be included as objectively verified indicators. These performance or outcome indicators are easy to collect and analyze while project management and the subsector ministry alike will readily understand the findings.

This approach has worked where the road network is well trafficked. In this situation, the proponents of quantitative techniques have argued that traffic-based evaluations underestimate the

real impact of a road. Wider impacts captured by household and community surveys are needed to calculate the full treatment impacts of improvements. This inevitably leads to the "gold standard" RCT approach in which panel data for project and comparable control villages is used to capture changes in household economic and social behavior before and after the road investment. To address this concern, the gold standard RCT methodology has incorporated a range of qualitative methods. These typically include key informant interviews and Participatory Transport Assessments (PTA) and have either used them "sequentially, to inform the next phase or cumulatively to validate the data".

Institutional framework: Impact evaluations require an institutional commitment at national scale and not just in the subsector. A national capacity also needs to understand the need for a rigorous impact study and must be able to carry out it. This capacity includes the NPC, research organizations and the university sector. The financial and capacity needs of this commitment lie beyond the scope of most SSA countries and it is expected that support from development partners will be needed.

Table 6-1: Steps in the Evaluation of a Rural Transport Project (up to the Baseline)

Step 1: Deciding whether to implement an impact evaluation
Is there sufficient support and cooperation?
• From the government
• From the bank project team and bank management
• From funding sources
Is a credible evaluation feasible?
• Is there in-country capacity (data collection, supervision)?
• Are there existing or planned surveys that can be used or questionnaires that can be adapted?
• Is there a potential sampling frame in the prospective zone of influence?
• Is there time to prepare and field a baseline before the project begins?
• Can a counterfactual be identified under seemingly plausible assumptions?
Step 2: Learn from the ex-ante evaluation
Understanding program placement: to understand biases in the ex-post evaluation and define an appropriate counterfactual
Step 3: Set up the evaluation team

Finding a stable in-country home for the evaluation.

- Choosing an evaluation team that is reasonably independent of executing agency but can still work with that agency as need be: local counterpart, interviewers, data processors

Step 4: The evaluation design: deciding what data are needed

Outcome variables (distributional impacts, traffic counts, time use, travel diaries) ;Control variables (similar road length and function; community size, agro ecology, Project data Choice and definition of:

- Zone of influence
- Beneficiaries: communities, households, firms, individuals
- Comparison areas

Step 5: The evaluation design: Collecting the data

- Identify data sources and data collection methods
- Sampling and sample size
- Designing survey instruments
- Deciding on timing of baseline and follow-up rounds

Step 6: Analysis and writing up

- Plan adequate time for data processing: entry, cleaning, lessons for follow-up; analysis of baseline
- Plan for follow-up survey(s)

The focus on impact monitoring appears relatively straightforward but in reality requires a distinction between effects and impact, terms used interchangeably in the literature.
The program framework outlined in Diagram 5-1 provides an indication of the higher-order outcomes to be assessed in the achievement of Facility objectives and goals with a detailed methodology on how these indicators will be assessed over the life of the program.

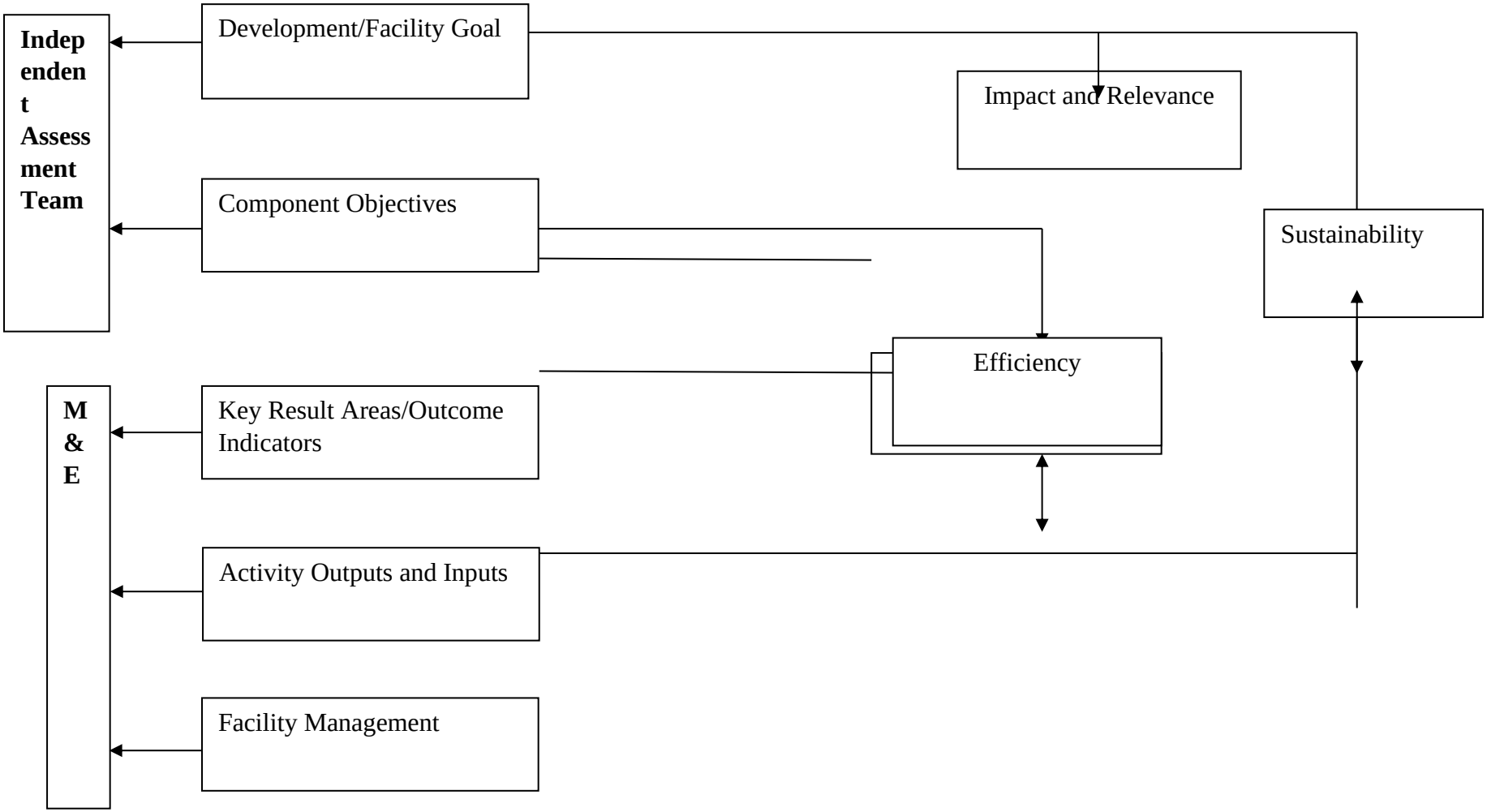
The Independent Assessment Team (IAT) will assess the facility goal and associated objectives. The IAT should ideally be independent of the Managing Contractor (MC). However, a proposed solution to select a team of consultants proposed by the MC and for the MC to contract and mobilize the team. The IAT would work closely with the respective departmental M&E Specialist and the IAT will be responsible for the development of appropriate assessment tools to gauge change and impact.

The M&E specialist through a six-monthly review as part of the overall reporting process will assess component objectives and result areas. Information relating to the management of the facility will be derived from advisor monthly reports and also through six-monthly reflection and review sessions aimed at reviewing systems and processes and their contribution to the management of Facility activities.

Results at the activity level will be derived from reporting against individual activities in individual reports. Activities will not be aggregated since they are varied and disparate, however, they will be grouped under specific key result areas.

In summarizing the overall approach, the below depicted diagram outlines the various levels of influence and responsibility. The IAT will be responsible for higher level impact M&E. The M&E Specialist will focus efforts at the program framework and activity framework and generate results to feed into the higher-level evaluations and studies.

Fig. 6-1: Flow of Information and Level of Responsibility



Given these concerns, it is nevertheless possible to identify the likely results chain brought about by interventions (Table 5-2). The table highlights the positive 3 relationships expected from an evaluation; it should be noted that the strength and direction of the relationships is dependent on the national and regional context as well as the dynamics of the local economy. This theory-based approach is ideal for a project based impact evaluation as it uses existing logical frameworks to map out the causal chain from inputs to outcomes and impact, and tests the underlying assumptions and development expectations behind the project design. It therefore sheds light not only on what works but also why it works and can be broadened to include access impacts on social capital and networks.

Table: 6-2: Likely Effects and Impacts of Road Improvements

Activity area	Effects		Impact
Increasing Time			
Direct road surface dependent changes			
Traffic and transport	Lower vehicle operating costs and hence transportation Charges, fares and tariffs (+++) Faster, more reliable and safer Travel (+++)	Improved access to Cheaper/better goods And services (+++)	Traffic growth and more efficient Transport services (modal composition) (+++)
Indirect traffic and transport dependent changes			
Economy	Lower transportation charges, Fares and tariffs (+++) Increased access to extension, Inputs and markets (+++)	Increased productivity of businesses (+++) Increased Productivity of agriculture (+++) Increased income and consumption	
Education	Saved time and effort, hence Increased energy and time to Channel in to education and easier access to schools (++)	Improved delivery of education (+)	
Health	Increased access to health care (++) Increased access for public Health extension work-Ers/outreach programs	Improved delivery of health care (+) Improved water, sanitation and Hygiene (WASH) potable water (+)	

Individual well-being	Saved time & effort (++)	Greater empowerment for women (+)
Social capital and networks	Changes in mobility (+)	Maintenance of social networks (+)
Governance	Greater access/interaction with government agencies (+)	More effective lobbying for other Development interventions (+)

Traffic and transport studies have been the most consistent and widely applied focus for impact studies yet in reality, they should be considered to be one of the immediate effects or outcomes and are at the core of performance monitoring.

Traffic: Traffic analysis examines the levels and mix of all traffic to ascertain if post improvement traffic flows are cheaper, faster and safer which is often associated from a modal shift from less efficient to more efficient transport vehicles. The first two benefits assess cost and savings and are often the basis for economic analysis to confirm if the project was a sound investment in Net Present Value (NPV) of Economic Internal Rate of Return (EIRR) terms and form part of a more comprehensive cost benefit analysis. These conventional economic models are developed at the appraisal stage and are revisited as part of the project results monitoring. Importantly, if the economic benefits fail to achieve an acceptable economic rate of return then the improvement has been over designed, which equate to a waste of resources or a planning weakness—a cause for concern for project management and client alike since it may represent a planning and design weakness.

A guide for pro-poor transport appraisal identifies these in terms of 1) the initial costs of the investment; 2) the direct savings in the costs of operating vehicles 3) economies from reduced road maintenance; 4) time savings incurred by travelers and freight; 5) resource savings generated from reductions in road accidents and 6) the wider effects on the economic development of a region from changes in transport conditions.

Transport: While transport is directly affected by savings in vehicle operating costs owing to reductions in the roughness brought about by road improvements, the critical question in terms of assessing impact is whether these savings are passed on to travelers and producers paying for transport services. All too often transport operators plying low volume roads face little competition and fail to pass on any post improvement vehicle cost savings they enjoy. An examination of this tendency in Malawi indicated that “transport costs on poor feeder roads are disproportionately high as operators contend with the low volume of goods carried over short distances to local market centers and the possibility of empty backhauls”. A more recent study in Ethiopia confirms this relationship. It found that distance from markets was correlated with increased transport costs and concomitant drop in demand for freight of more than 1,100 kg per household in accessing communities to just over 500 kg in the more remote areas.

Alternatively, households on poor roads with few transport services may pay high transport costs indirectly by accepting lower prices for their farm produce i.e., by selling at the farm gate. This poor access is to some extent being overcomed by the widespread use of mobile phones. Mobile phones are used to check market prices and organize the bulk movement of production to markets offering the best prices.

In all of the above cases, it needs to be highlighted that the transport cost reductions arising from feeder road improvements as a means of increasing agricultural production and in the case of Ethiopia as a cost-effective way of reducing poverty. In contrast, recent research in Malawi suggests that reduced VOCs do not translate to reduced transport prices (especially where traffic volumes are low) and reduced transport prices do not translate to poverty reduction if the poor cannot afford to use transport services or need other factors to increase production. These contrasting cases illustrate the lack of consistent impact evaluation findings, which in turn highlight the importance of the research setting.

Environmental concerns: Transport interventions have both direct and indirect environmental impacts. These begin with the acquisition of productive agricultural land and housing for both the right of way as well as borrow pits/quarries for road building material. Road construction practices also expose the workforce and people living alongside the right of way to a range of hazards ranging from "imported diseases" to noise and dust. Finally, the resultant traffic effects may impact on social and environmental well-being.

Table 6-3: Typical Environmental Concerns for Strategic / Provincial Road Project

		Equipment-Based Contracts			Labor-Based Contracts		
		B3 Road Rehabilitation	B2 County Level Spot Improvement	B1Country Level Routine Maintenance	B3 Road Rehabilitation	B2 county Level spot Improvement	B1 county Level Routine Maintenance
	Soils & Geology	xxx	xx	x	xxx	xx	x
	Hydrology	xxx	xx	x	xxx	xx	x
	Air Quality	xxx	xx	-	xx	x	-
	Flora	xxx	xx	-	xxx	xx	-
	Fauna						
	Protected Areas						
	Economic Characteristics	√√√	√√√	√√√	√√√	√√√	√√√
	Social Issues	xxx	xx	-	√√√	√√√	√√√
	Land use	-	-	-	-	-	-

	Resettlement, Compensation	x	-	-	x	-	-
	Ethnic Minority Considerations	-	-	-	-	-	-
	Infrastructure	-	-	-	-	-	-
	Cultural resources	-	-	-	-	-	-
	Public Health & Safety	xxx	xx	x	xxx	xx	x
	Waste Disposal	xxx	xx	x	xxx	xx	x
	Noise	xxx	x	-	xx	x	-

*** Negative Impact; √√√ Positive Impact

A range of policies, guidelines and practices, which are designed to identify and mitigate any of the identified environmental concerns within a framework must be used to develop an Environmental and Social Impact Assessment (ESIA), which will in turn be addressed by an Environmental Management Plan (EMP) to monitor and mitigate the ESIA concerns.
An evaluation of the ESIA process need to identify a number of findings that are relevant to impact evaluations as:

- Short-term environmental outcomes
- The quality of long-term environmental road management and maintenance is often deficient, in contrast to short-term effects
- Induced secondary environmental damages from road construction—such as deforestation, unplanned land settlements and loss of bio-diversity—are rarely mitigated through project and sector interventions.

IMPACT EVALUATION METHODOLOGIES

Impact evaluation methodologies in the transport sector have been largely driven by an economic agenda, which has favored quantitative techniques. Five types of quantitative methodologies (Table 5-3) could be applied to the evaluation of transport projects or programs and policy interventions. The first two, **macro and sector studies are more commonly used to assess national and international road investment policies, while the last three, cross-sectional, longitudinal and panel studies, are likely to be applied to project and program M&E**. These quantitative techniques are discussed first, before qualitative techniques are introduced as an

overlapping and supporting methodology to what might seem to be an over reliance on quantitative approaches by the transport sector.

Table 6-4: Methodologies commonly used in Road Transport Impact Studies

Macro studies establishing links between poverty and other indicators and provision of roads.

Brief Methodology	Data requirements
-Establish relationship between the poverty indicator (headcount index) and existing road provision (road Density) using cross-sectional data -May involve visual analysis using GIS - Use secondary data	Unit Geographical areas (states, provinces, Districts)
Advantages	Disadvantages
-Simple ,quick and less costly -Provide an overall assessment of the relationship be Tween infrastructure availability and other indicators Including poverty indicators Does not require primary data collection	May not be able to provide the direction Of the causes and effects A geographical area based approach

1. **Sector studies establishing the relationship between poverty and expenditure in the road sector using time series data**

Brief Methodology	Data requirements
Use time-series data of investment in different sectors including roads, poverty and other variables Develop statistical relationship (with econometric techniques) between poverty reduction, investment in different sectors and other variables (with dummy variables)	Unit geographical areas (provinces or districts)
Advantages	Disadvantages

Quick and less costly No need or collection of primary data Provide the statistical relationships between a dependent variable and independent variables (e.g. the relationship between the poverty reduction and road expenditure) Econometric techniques able to establish the road investment elasticity of poverty reduction	Only provides an indication of overall changes but will not provide any indication on the subtle changes at the household level; Secondary data may be difficult to find A geographical area based approach

2. Cross sectional study using with-without ex-post data

Brief Methodology	Data requirements
Collect cross sectional data of treatment and control groups Only compares the averages between treatment and control groups. Implemented in combination with qualitative methodology	Household/ community
Advantages	Disadvantages
Less costlier than similar studies that collect panel data; May able to provide good social and poverty analysis framework is used to establish the counterfactuals.	May overestimate/ underestimate the benefits/ dis-benefits due to the bias arising from the non-establishment of counterfactuals; Due to the contamination of the observable characteristics by the effects of the project the propensity score matching may be not entirely reliable.

3. Longitudinal studies: with/without and before/after roadside data

Brief methodology	Data requirements
Uses treatment and control groups for comparison of Outcome indicators Compares outcome indicator averages	Mainly roadside
Advantages	Disadvantages
Easy to design and to implement	From the roadside interview it is difficult to establish the traveler's social class

Suitable for comparison of transport related indicators (e.g. traffic and cargo volume, transport tariffs etc.)	May involve several round of data collection Suitable only for assessment of transport related indicators

4. Panel surveys of before-after and with –without data

Brief methodology	Data requirements
Compare the before and after difference in outcome indicators between treatment and control groups (e.g. households) Sometimes also estimate the "double difference" (or Difference-in-differences) Often used with propensity score matching to eliminate/reduce biases Both quantitative and qualitative techniques are used concurrently to complement each other	Household/ community
Advantages	**Disadvantages**
When used with a proper method to eliminate biases it is the most comprehensive and costly methodology In theory, it is able to provide the most robust results	Expensive and involves considerable data Collection effort Require a lot of computational resources. Technically challenging May be subjected to "attrition bias"- due to drop-out problems in repeat surveys

Macro and sector study techniques tend to use secondary data to test existing theories and hypotheses on the relationship between rural transport and the development process and predict for example the likely poverty reducing impact of an investment policy. These techniques tend to use multiple regression analysis or allied econometric techniques to estimate the relationships between variables, as measured by indicators. The aim of these techniques is to establish a statistical relationship or elasticities between a dependent variable and one or more independent variables. The direction and causation of these relationships may not be explored and their resolution is such that they fail to pick up small-scale changes at the community and household level. As a result, these studies are mainly used at the policy level to advocate or justify national and/or international investment in the transport sector and do not lend themselves to project level impact evaluation.

Cross sectional, longitudinal and panel impact studies have tended to be applied to the evaluation of transport projects and pose major empirical challenges since 'natural' experiments involving large and permanent changes in transport costs are rare, if non-existent. This constraint explains the widespread use of quasi-experimental designs beginning with simple with-without/cross sectional and longitudinal evaluations culminating in the "gold standard" statistically sophisticated and complex longitudinal Randomized Control Trial (RCT) panel survey. These studies largely collect their own primary data for analysis although some of the project relies on secondary data to varying degrees.

Conventionally, impact studies have adopted a "quasi-experimental design" to undertake a cross sectional comparison of randomly selected communities and households, as a baseline study or benchmark. This is followed up several years after the project has finished with a before/after, with/without comparative survey. The rigor of the analysis associated with this follow-up survey is used to identify two types of impact study (longitudinal and panel studies). The first is a simple approach that uses descriptive statistics to explain differences between the cells. The second is a much more complex approach that uses statistical techniques, notably propensity score matching, to identify before and after groupings or "panels" of closely matched "treatment" and "control" households to isolate differences and attribute them to the intervention. This approach is considered the "gold standard" evaluation for quantitative approaches but does not preclude the use of other evaluation methodologies.

Table 6-5: The Quasi-Experimental Design

		Cross-sectional comparison	
		With	Without (controls)
Longitudinal comparison	Before	Communities and Households situated directly on the road.	Communities and Households situated out-side the road corridor/zone of influence.
	After	Communities and Households situated directly on the road.	Communities and Households situated out-side the road corridor/zone of influence.

Longitudinal studies invariably adopt a double difference methodology to make comparisons between the four cells in Table 5-4 above.

Table 6-6 How to do a Double Difference Impact Study?

Step 1	Undertake a baseline survey before the intervention is in place, and the survey must cover both non participants (non-beneficiaries) and participants

	(beneficiaries). If you do not know who will participate, you have to make an informed guess.
Step 2	Undertake one or more follow up surveys after the program is put in place. These should be highly comparable to the baseline survey (in terms of the questionnaires, the interviewing, etc.). Ideally the follow up surveys should be of the same sample observations as the baseline survey.
Step 3	Calculate the mean differences between the after and the before values of the outcome indicators for each of the participant and non-participant groups.
Step 4	Calculate the differences between these two means differences (the double difference). That is your estimate of the impact of the program.

Qualitative Methods

Qualitative methods are now commonplace in most IEs when used to build up information on likely outcome indicators, baseline attributes and controls for heterogeneity and other exogenous factors. They also serve to triangulate findings from quantitative tools as well as to explore the causal processes in statistical associations and correlations. They usually fall into two types — Rapid Transport Appraisal and Participatory Transport Appraisal.

Thus, RTA techniques like focus group discussions and stakeholder analysis may be used to explore the common travel patterns and map the location, distance/travel times to health, education and agricultural services, as well as understanding of the power relationships, influence, and interests of various groups benefiting from an intervention. It is argued that well designed and facilitated, qualitative methods are rigorous as they can count the uncountable, and generate statistics for relevant dimensions otherwise overlooked.

Rapid Transport Appraisal	**Participatory Transport Appraisal**
Definition	
Rapid appraisal methods are quick, low-cost ways to gather the views & feedback of beneficiaries and stakeholders, in order to respond to decision makers' needs for information	Participatory methods provide active involvement in decision-making for those with a stake in a project, program, or strategy and generate a sense of ownership in the M&E results and recommendation
Common Types	
• Mini-survey • Key informant interview • Focus group discussion • Community group interview • Direct observation	• Stakeholder analysis • Social mapping • Wealth or well-being ranking • Beneficiary assessment • Participatory Monitoring and Evaluation
What can we use them for?	

• Providing rapid information for management decision-making, especially at the project or program level • Providing qualitative understanding of complex socio-economic changes, highly interactive social situations, or people's values, motivations, and reactions • Providing context and interpretation for quantitative data collected by more formal methods	• Learning about local conditions and local people's perspectives and priorities for more responsive and sustainable interventions. • Identifying problems and trouble-shooting during implementation • Evaluating a project, program, or policy • Providing knowledge and skills to empower poor people
Advantages	
• Low cost • Can be conducted quickly • Provides flexibility to explore new ideas	• Examines relevant issues by involving key players in the design process • Establishes partnerships and local ownership of projects • Enhances local learning, management capacity, and skills • Provides timely, reliable information for management decision-making
Disadvantages	
• Findings usually relate to specific communities or localities—thus difficult to generalize from findings • Less valid, reliable, and credible than formal surveys	• Sometimes regarded as less objective • Time-consuming if key stakeholders areinvolved in a meaningful way • Potential for domination and misuse by some stakeholders to further their own interests
Cost	
Low to medium, depending on the scale of methods adopted	Low to medium. Costs vary greatly, depending on scope and depth of application and on how local resource contributions are valued
Skills Required	
Non-directive interviewing, group facilitation, field observation, note-taking, and basic statistical skills	Several days' training for facilitators
Time Required	
Four to six weeks, depending on the size and location of the population interviewed and the number of sites observed	Varies greatly, depending on scope and depth of application

A number of key principles that should be followed before a RT project commits to undertake an impact study as follows:

1. There has to be a strong government and sector interest and commitment to undertake a robust impact evaluation.

2. Ideally, the impact study should be also aligned with government systems and be part of a capacity building exercise to carry out evaluations as part of the normal administrative, sector and governance functions that asks "what works, and for whom" This widens to impact evaluation to include CBS and where appropriate university staff/research institutions. It should be possible to draw expertise from these organizations and put together a team of national researchers, supported by one or more international experts who have experience of conducting robust road impact evaluations.

3. The scope of the evaluation has to be clearly defined by the client (public authorities). It should answer one or more of the following questions:
   - Is the intervention making a difference – What has happened because of the intervention?
   - What are the results on the ground – Has the project delivered its expected benefits?
   - These in turn can be addressed by a number of indicators or variables, which can be collected by both quantitative and qualitative techniques, as a baseline before the project has initiated any works and at various stages after the works have been completed.
   - The cost of impact studies reflects the scope defined by the client. At its simplest, an evaluation can undertake qualitative user-focused access surveys costing $100/200,000. At the other extreme, "gold standard" randomized control trials costs can exceed US$1 million in today's terms. The costs of the latter, and the need for international expertise, make them suitable only where there is significant government and DP commitment to the rural transport sector.

7. Change Management, Capacity Building and Institutionalization for Effective M&E of Transportation Infrastructures

Change management for M&E requires an understanding of who the internal and external stakeholders are, what their specific M&E needs are and identifying suitable communication channels for them.

Internal stakeholders include Programme Managers, the HoD and Office of the NPC. External stakeholders would include user departments, Central/Provincial Treasury, Federal/Provincial Legislature and Portfolio Committee on Public Works, the Economic Cluster, contractors and consultants, members of the public and national government departments. Suitable communication channels to reach internal stakeholders include meetings, monthly reports, memoranda and circulars, email and use of the intranet. For external stakeholders, the following communication channels should be considered: the NPC's website, quarterly and annual reports, Citizen Reports, public participation programme, etc.

In terms of capacity building, the NPC M&E could be the most effective and efficient component and could compare existing capacities with what is required to implement the M&E Framework. The M&E function needs to have the following skills: working knowledge of M&E, theoretical knowledge of M&E, understanding of government systems and procedures, research skills (especially data analysis), database skills, capacity building and facilitation skills for training, mentoring and coaching people in the use of the system. Once a skills audit has been conducted, gaps can be identified, and various capacity building options can be costed and built into skills development plans of individual officials. Capacity building initiatives should ensure that:

- The users of M&E data understand how to integrate M&E functions within their areas of responsibility and how to respond to M&E findings
- M&E Practitioners are able to set up an M&E system, manage that system, and produce the results required for M&E from it
- M&E Practitioners have sufficient technical skills in respect of M&E and quantitative analysis techniques to produce credible M&E findings

Each programme will have to consider a range of interventions to build capacity in the short, medium and long term. These include:

- ✓ Recruitment of appropriate specialist skills: These include not only generic M&E skills, but also individuals with appropriate sector expertise.
- ✓ Training of existing staff: These include both line management and M&E specialists. Training modalities can include external formal qualifications from higher education institutions as well as in-house customized courses.
- ✓ On-the-job training and mentoring
- ✓ Structured skills transfer from academics, consultants and other external providers.
- ✓ Creation of internal M&E forums and participation in external learning networks

It is important that M&E practitioners form part of M&E communities of practice and M&E networks, as part of on-going professional development and to ensure exposure to evolving good practice. The NPC shall share the knowledge and wisdom generated through their M&E processes both internally and with their counterparts in the sector.

Once a skills audit has been conducted, various capacity building options can be identified, costed, and included in the individual official's skills development plans. The timing of the rollout of capacity building interventions may be tempered by budget or labour market skills constraints. These risks should be noted and carefully managed.

The M&E of NPC shall establish the unit in line with federal, provincial and local level requirements and accordance with best practice. The next steps in the departmentalizing effective M&E in the NPC include:

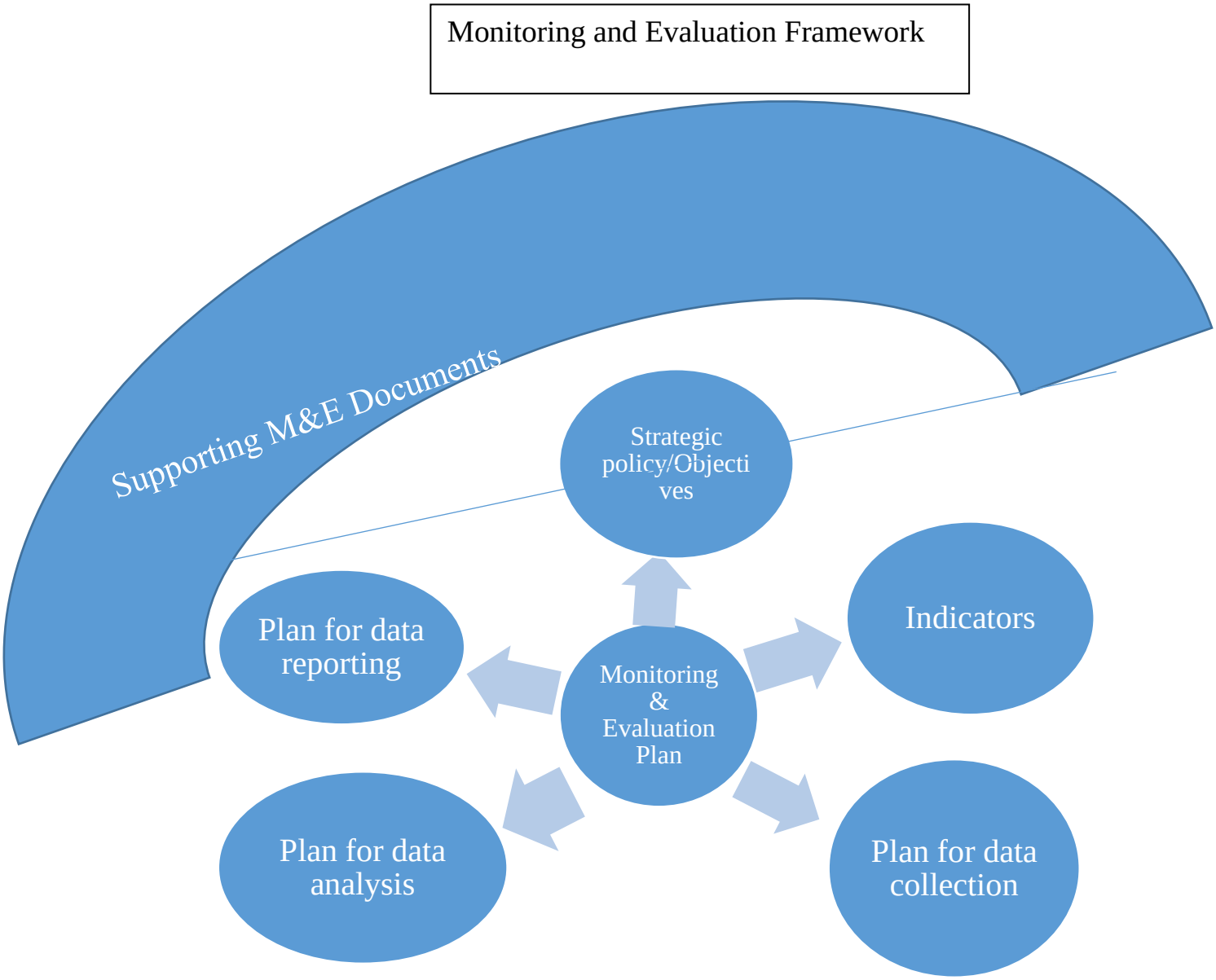
- Establishing an effective and efficient M&E Unit and capacitating it appropriately in order to implement the M&E Framework
- Begin collecting baseline data where this is missing in the department so that future M&E work has credible data for reference
- Change management, with particular reference to changes in the former arrangement and the new M&E Unit
- Training on M&E and its potential to contribute to management effectiveness
- M&E Plan and supporting document

A review of the M&E Framework shall take place annually, and should include the testing of the M&E system and how this can be refined and improved over time.

8. Link between M&E Framework (MEF) and M&E Plan (MEP)

The M&E Framework describes the approach that the organization/department undertakes in developing an M&E system whereas M&E plan is the set of aspects for data collection, analysis and reporting for the targeted indicators which any organisation/department is required to look upon.

Fig. 8-1: M&E Framework, Plan and Supporting Documents



The Annual Performance Plan (APP) contains a set of indicators which need to be monitored and reported on throughout the year. In addition, the indicators that need to be considered are required to report on in terms of the National Delivery Agreements. For each indicator that the department is required to report on, a plan for data collection, analysis and reporting is required. This is what constitutes the M&E Plan.

In addition, supporting documents such as forms and procedure guidelines will be required in order to operationalize the M&E plan. The M&E Framework describes the approach that the organisation will take in developing an M&E system. This includes an understanding of the M&E function in the organisation, its capacity and constraints in terms of the delivering on the M&E Plans, as well as capacity building and change management plans for institutionalizing M&E Plan.

ANNEXES

ANNEX A: Existing National / International Guidelines and Standard Documentation

There are a wide range of M&E guidelines and standard documentation for development projects including transport improvements. They tend to be unique to each development agency, reflecting their need to plan and improve their development programs as well as demonstrate that development aid is well targeted and delivering tangible benefits to the poor.

Some of them could be demarcated as:

Department for International Development (DfID):

Bilateral agencies like the DfID indicate that "*high quality evaluations help us spend aid more effectively so that more people are lifted out of poverty. Moreover, because evaluations are published, they provide a direct line of accountability: to Parliament, the British public and our partners in recipient countries*". (DfID website) Their evaluations are therefore designed to assess the relevance, effectiveness and efficiency of the DfID programs.

Organization for Economic Co-operation and Development (OECD) –Development Assistance Committee (DAC) Criteria:

The 24 member countries and seven multilateral agencies who are members of the OECD Evaluation Network tend to use the principles, glossary and criteria laid out in the Principles for Evaluation of Development Assistance (OECD-DAC 1991), updated in the Glossary of Terms in Evaluation and Results-Based Management (OECD-DAC 2004). This defines impacts as "*positive and negative, primary and secondary long-term effects produced by a development intervention, directly or indirectly, intended or unintended*". "*The examination should be concerned with both intended and unintended results and must also explain the positive and negative impact of external factors, such as changes in basic policy environments, general economic and financial conditions*".

These and other definitions in the Glossary emphasize the differences between the monitoring of project/program efficiency, effectiveness and impacts outlined in Figure 1-1 .This set of project-centered definitions draws heavily on the project Logical Framework Matrix (LFM). The LFM in turn is the product of the project intervention logic and both help frame the impact evaluation questions but they have their limitations. The Logical Framework Matrix simplifies development to a cause-and-effect process in which resource inputs create physical outputs, which in turn trigger a series of predicted outcomes that over time accumulate into a development impact.

Nevertheless, the DAC guidelines set out the key impact questions that most of its members apply such as-

1. What has happened as a result of the program or project?
2. What real difference has the activity made to the beneficiaries?

3. How many people have been affected?

The OECD-DAC documents have laid the foundation for the impact evaluation activities of its members over the past twenty years. A recent review of their evaluation activities indicates that an increasing number (58%) undertook impact evaluations. In doing so, many members needed to set out their own guidelines to support impact studies as well as identifying skill shortages among staff and consultants to increase the focus and rigor of the resultant reports. This study also noted that cross-cutting issues, such as gender and the environment, were now routinely mainstreamed across all evaluations by a number of agencies .

Guidelines produced by the DAC Evaluation Network Members:

Generic guidelines have been developed by most DAC members undertaking impact studies. These range from generalized approaches as typified by IFAD, to the more detailed approach by the European Union to the more subsector/institution specific guidelines produced for Nepal by ADB funded technical assistance. These different types of guidelines are described below:

International Fund for Agricultural Development (IFAD):

The IFAD approach to evaluation draws on the above OECD/DAC Glossary to define the impact of its programs as "the changes that have occurred or are expected to occur in the lives of the rural poor (whether positive or negative, direct or indirect, intended or unintended) as a result of development interventions". The Evaluation Manual is generic in its approach setting out the fundamentals of the different impact methodologies that might be used and demonstrating how these might be applied to specific projects and country programs.

European Commission (EC):

The European Commission has produced an Evaluation Guideline in four volumes: This first volume outlines basic concepts and methodologies. The second focuses on evaluating country programs, while the third concerns specific projects such as transport. The fourth volume presents the common Evaluation Tools. The documents go on to identify the main .evaluation criteria.

Relevance: the extent to which the objectives of the development intervention are consistent with beneficiaries' requirements, country needs, global priorities and partners' and EC's policies.

Effectiveness: the extent to which the development intervention's objectives were achieved, or are expected to be achieved, taking into account their relative importance.

Efficiency: the extent to which the outputs and/or desired effects have been achieved with the lowest possible use of resources/inputs (funds, expertise, time, administrative costs, etc.).

Sustainability: the extent to which the benefits from the development intervention continue after termination of the external intervention, or the probability that they continue in the long-term in a way that is resilient to risks.

Impact: identify positive and negative, primary and secondary long-term effects produced by a development intervention, directly or indirectly, intended or unintended.

Coherence: the extent to which activities undertaken (a) allow the European Commission to achieve its development policy objectives without internal contradiction or without contradiction with other Community policies and (b) complement partner country's policies and other donors' interventions.

Community value added: the extent to which the project/program adds benefits to what would have resulted from Member States' interventions in the same context.

Four analytical procedures are identified for impact studies:

- Change analysis, which compare indicators over time and/or against targets;
- Meta-analysis, which extrapolates upon findings of other evaluations and studies, after having carefully checked their validity and transferability;
- Attribution analysis, which compares the observed changes with a "policy off" scenario, also called counterfactual;
- Contribution analysis, which confirms or disconfirms cause-and-effect assumptions on the basis of a chain of reasoning.

The first analytical procedure is the lightest one and may fit virtually all questions posed by the above criteria. The last three procedures are better at answering cause-and-effect questions that mainly arise from the last three criteria (EC, Volume 3, 2006).

There appears to be no specific impact evaluation guidelines for rural transport but a list of generic transport sector indicators has been identified by the Evaluation Unit, and these are adopted and appropriately used on a country specific basis where transport forms part of the Country Strategy or National Indicative Program (EU, 2009).

Asian Development Bank: Interim Guidelines for Enhancing Poverty Reduction Impact of Road Projects in Nepal:

These guidelines are the output of the capacity building efforts of the ADB in Nepal. They were developed to strengthen existing methods and procedures used by the Department of Roads (DoR) in Nepal and to introduce its management and M&E staff to basic poverty concepts, their measurement and the impact of the road sector on poverty. The guidelines fall into two parts. The first part sets the national and sector context in terms of the Government of Nepal's poverty reduction policies and its interaction with road improvement. The second contains detailed guides,

and procedures to be followed if the DOR is to enhance the poverty reduction impact of road projects. These are followed by a number of annexes that give specific examples of steps, samples and strategies that be applied. These include:

- ✓ A Decision Flow Chart on the Potential Use of Labor-Based Approaches
- ✓ A Guiding Note on Social Assessment
- ✓ The Design and Implementation an Ex-post (Impact) Evaluation Study

World Bank (WB) Guidelines:

There are a number of M&E guidelines emanating from a number of sources in the World Bank. These range from detailed descriptions of the "gold standard" RCT technique to more pragmatic discussions about monitoring under resourced SSA. One of the most recent of these is from a cooperative effort with FAO entitled "On the tracking results in agriculture and rural development in less-than-ideal conditions – A sourcebook for monitoring and evaluation". The less than ideal conditions it refers to are associated with monitoring results (outcomes and impact) in many rural areas. It recognizes that "gold standard" RCT impacts are invariably data-hungry requiring statistical and econometric skills that are in short supply among project and government development professionals alike. The authors therefore advocate the adoption of a service delivery approach, which emphasizes three project outcomes. For a rural road project these outcomes are

a) the percentage of the target population having access to transport services on the new road i.e. the RAI definition of within two kilometers;
b) the percentage of the target population using transport services over a fixed period of time e.g. the last week, and
c) the percentage of users satisfied with the condition of the new road possibly in affordability, speed or comfort terms.

A variation of this service delivery approach has been developed for a community infrastructure improvement program in Nigeria.

Rural transport Guidelines produced by other development agencies

ILO:

ILO's Results-Based Management (RBM) Guidebook (2012) defines the evaluation process as "a distinct, essential and complementary function to performance measurement and RBM". The latter is in effect a type of performance monitoring used to assess whether results or outcomes have been achieved.

In contrast, evaluations are used to inquire about why and how results were achieved. The evaluation function provides information not readily available from performance monitoring systems, in particular in-depth consideration of attribution, relevance, effectiveness and sustainability. ILO also stresses the importance of an independent judgment on the functioning of

its performance system and recommending appropriate management action. Evaluations are mainly designed to promote organizational learning by highlighting useful lessons that can be applied elsewhere to improve program or project performance, outcome, or impact. They also serve accountability purposes by feeding these lessons into the decision making process of stakeholders, including donors and national partners. The resultant evaluations are essential short-term effect studies rather than long term impacts—evaluations of the Nias Islands Rural Access and Capacity Building Project, Quick Impact Employment Creation Project (QIECP) for Youth through labor-based Public Works in Sierra Leone. They have the advantage of rapid management feedback of results but lack methodological rigor in the collection and use of impact data.

Nevertheless, ILO has produced several notable guidelines that have some application in rural transport impact assessments. The first is Murphy's elaboration of rapid survey methods to assess the poverty reduction impacts of pilot employment-intensive projects (1998). The document details the methods, tools and procedures to undertake a Rapid Assessment of Poverty Impacts (RAPI) of rural road project. It sets out four steps in the process:

i. definition of the (geographically bounded) study area and separate control site
ii. use of rapid, but rigorous, methods of random sampling
iii. household-level analysis
iv. use of five classes of simple poverty indicators, eschewing income or expenditure measures

Unfortunately, these guidelines are rather old and do not take into account the current preference for more statistically rigorous Randomized Control Trials (RCTs).

In summary, the current ILO approach to evaluation focuses on the results of an intervention, identifying what worked, what didn't work, and why this was the case. It is defined as "an evidence-based assessment of strategy, policy or program and project outcomes, by determining their relevance, impact, effectiveness, efficiency and sustainability. An evaluation should provide information that is credible and useful, enabling the incorporation of lessons learned into the decision-making process of both recipients and donors".

Millennium Challenge Corporation (MCC):

The Millennium Challenge Corporation (MCC) see independent impact evaluations as fundamental to its core mission since they help answer three fundamental questions:

- Was the investment implemented according to plan? (This is the key to transparency).
- What are the changes in income for program participants that are attributable to MCC's investment? This is key to accountability.
- Why did or didn't the planned investments lead to changes in income? This is key to learning.

MCC argue that impact evaluations are the most rigorous form of evaluations for they make it possible to know whether the observed impacts were caused specifically by an intervention or, alternatively, are the result of external factors that affected program participants and non-

participants alike. They do this by comparing what happened with the intervention to what would have happened without it i.e. through the use of a counterfactual.

Impact Evaluation Frameworks in Rural Roads:

There are a number of existing impact evaluation guidelines and standard documentation for development projects including rural transport improvements. They tend to be unique to each development agency, reflecting the need to plan and improve their development programs as well as demonstrate that development aid is targeted and delivering tangible benefits to the poor. They tend to distinguish three broad methodological approaches to assessing socioeconomic impacts, which are outlined below. The first and third are generally applied to specific DP-funded road projects and rural transport programs while the second group is more often applied to policy level analysis and exploratory research.

Cost-benefit analysis or cost comparisons:

Conventionally cost-benefit analysis, using a version of the World Bank's Highway Design and Maintenance [Standards model] (HDM III or IV), is applied to the economic evaluation of rural road projects. As a rule of thumb, depending on the improvement costs, such analysis requires a minimum of 50 motorized vehicles per day, excluding motorcycles, for the road to generate a high enough economic [internal] rate of return (EIRR). Thus, the first phase of the Secondary, Tertiary and Rural Roads Project in Morocco, constructed three roads with some 192, 275 and 640 motorized vehicles per day. HDM III was applied to calculate the EIRRs and the results ranged from 21% to 39% comfortably exceeding the 12% threshold applied at the road selection and appraisal stage. This pattern was repeated in the second phase, which ended in 2001 when similar traffic levels generated EIRRs in excess of 15.9%.

In the absence of traffic levels as high as this, the impact researcher looks to the agricultural, education, health and other social benefits to justify the investment. Thus in Ghana, the Road Prioritization Methodology (RPM) used a cost effectiveness procedure to prioritize feeder roads for improvement assuming that bicycle and head loading traffic would shift to motorized transport services once the road was improved. A preliminary impact assessment of traffic levels showed that this modal shift did not develop strongly as there was little or no evidence that the improved roads had attracted regular transport services. These findings affected the planning of further feeder road improvements to favor connecting rather than access feeder roads.

Financial a cost-benefit analysis (CBA) is also used to assess the impact and IRR of feeder roads built by the Productive Safety Net Program (PSNP) in Ethiopia. Construction costs are averaged at the household level, while benefits are the estimated transport cost savings involved in moving agricultural inputs and outputs. Other travel benefits are estimated in time saving terms for household members to access schools, water points and health centers .The assumptions behind these examples emphasize the difficulty of applying CBA techniques to investments on roads and tracks carrying low traffic volumes. Increasingly, governments and development partners have

looked to socio-economic and service benefits to justify improvements. The challenge for impact studies is to identify the direction and scale of these socio-economic benefits so they can be quantified in economic and well-being terms.

Macro and micro modeling

Statistical modeling has tended to be used by researchers to test or justify policy or hypothetical RT subsector impacts on the national or regional economy.

Macro modeling: The IFPRI approach to macro modeling has relied on a variety of multiple regression techniques to highlight the factors, which include rural transport access, that contribute to household poverty and estimate the direction and strength of the relationships. One of the early examples of this type of modeling is from Uganda, using time-series district data. Access was measured in terms of the average distance of households from three different types of roads, paved, murram, and feeder roads. The analysis identified investment in feeder roads as second to expenditure on agricultural research & development with a cost-benefit ratio ranging from 9.19 to 4.88 in Western and Northern Uganda. It estimates that 34 people were lifted out of poverty for every million shillings of government expenditure on feeder roads compared with a ratio of 12 and 58 people lifted out of poverty for agricultural research & development.

Another example of this approach is provided by the same authors' study in Tanzania, which uses a different data set to model total household income. Household access to socio-economic services is represented by the proxy indicator: distance (in km) of the household from public transportation facility. The results indicate that distance to public transport has a statistically significant inverse relationship with household income. This relationship weakens in three of the regions and even becomes positive in Lake Victoria. The study goes on to use the findings to predict the returns to investment, each kilometer of road built will increase income by 8.5%, which is equivalent to lifting 27 people out of poverty with a cost-benefit ratio of 1:9.3.

Micro modeling: This approach tries to estimate the benefits of interventions at the household level, which might be synonymous with the agricultural household in rural areas. This has been tried in several ways:

Travel time savings are a major benefit of transport investments in the developed world where the time saved for journeys is valued at the augmented wage rate for the person traveling and for non-work journeys by the willingness to pay for the time saved. This relatively straightforward calculation is more difficult to apply to developing countries because formal employment is limited and travel tends to be for multiple reasons often with very low economic returns. Nevertheless, it is suggested that if travel time were included in both impacts and appraisals this would lead to "higher returns for RT projects and redress the bias against rural infrastructure investments".

Revealed and stated preference analyses are mainly used to model travel choice or journey behavior in terms of destinations, routes, modes etc. In the first, the respondent′s choice is hypothetical and involves ranking or rating a set of journey options in preference terms associated

with the comfort, convenience, time saved, willingness to pay for travel and/or its environmental impacts .In the revealed preference model, the journey attributes are based on actual travel patterns and behavior. Stated preference techniques therefore tend to be used at the appraisal or forecasting stage of a project when they may predict demand, benefits or costs of an intervention.

ANNEX B: Monitoring and Evaluation Plan, Indicator Set and Supporting Documents (to be completed)

LAYOUT OF A PROGRAMME OR PROJECT EVALUATION PLAN AND REPORT

Layout for Programme/Project Evaluation Plan and for Evaluation Report

1. Cover page/Title page of M&E implementation plan:
2. Name of the public sector institution
3. The programme, sub-programme or project to be evaluated
4. The contact person details
5. Date
6. Table of Contents
7. Executive summary: one page summary of evaluation plan
8. Purpose of the report:
9. What is the purpose of the evaluation?
10. What are the main performance questions which will be analyzed?
11. How is it anticipated that the M&E findings will be used?
12. Programme/Project Background
13. Description of the Programme/Project to be evaluated
14. Underlying need fulfilled by the Programme or Project/ Problem statement/ overall goals. Most of these can simply be summarized from strategic plans, budgets or annual Performance plans,
15. Detailed Evaluation Plan
16. Scope of the evaluation
17. Selection of the evaluation team members
18. Identification of the relevant stakeholders
19. General approach to evaluation: e.g. will it be performed in-house or contracted out to external consultants or academic institutions?
20. Methodology to be used
21. What datasets will be required (surveys, administrative data etc.)
22. How will data be collected, verified and analyzed?
23. What will comprise the baseline information?
24. Citations of relevant literature or international case studies
25. What are the likely limitations of the findings?
26. Communication strategy: how will the findings be communicated to stakeholders? How will critical reflection and learning be encouraged?
27. M&E resources and indicative budget required , evaluation work plan with timelines, roles and responsibilities
28. Capacity building
29. Assessment of current data gaps likely to impact on future evaluations?
30. Training and human capacity gaps
31. Software, equipment and other resource gaps
32. Plans to address the above

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ANNEX C: Transport Infrastructure Development Action Plan

PRIORITY :							
PILLAR :							
OUTCOME	OUTPUT	SUB-OUTPUT/ACTIVITY	BASELINE	TARGET	INDICATOR	MEANS OF VERIFICATION	RESPONSIBILITY
An efficient competitive and responsive Economic Transport Infrastructure network	Integrated Transport Infrastructure Development & Delivery	Develop the strategic / provincial Infrastructure plan	15 year Strategic / Provincial Infrastructure Plan to be developed	20 year Transport Infrastructure Plan Developed by …date…	Completion Of the 20 year Transport Infrastructure plan	Monthly reports	
	Improved Strategic / Provincial Transport infrastructure	Rehabilitation of Surfaced roads	…… Km	…. Km	Number of kilometers of Surfaced roads re-habilitated	Monitoring reports	
		Re-sealing of Surfaced roads	…….m2	……..m2	Number of Square meters Of surfaced Roads re-sealed	Monitoring reports	
		Upgrading of Strategic / Provincial roads	…… Km	….. Km	Number of Kilometers upgraded	Monitoring reports	

		Construction of New bridges	…… Bridges completed	… nos.	Number of Kilometers constructed	Monitoring reports	
		Creation of jobs through Community based projects	…. jobs created	…….. jobs created	Number of Jobs created Through Community Based projects	Monitoring reports	
		Construction of Intermodal facilities	5 concept Designs completed	…… Completed Commence With Construction Of …….. Intermodal Facilities	Number of intermodal Facilities constructed	Monitoring reports	
		Construction of Traffic facilities	7 traffic Stations completed	…… License apps	Number of Traffic Facilities constructed	Monitoring reports	

ACTION PLAN

1. ROADS WING

Financial outlay	**OUTPUTS 2019-30**				**OUTCOMES 2019-30**		
2019-30	Outputs 2019-30	Indicator (s)					
			Unit	Target for 2019-30	Outcome	Indicator (s)	Target
1	2	3	4	5	6	7	8
Rs …… Crore	1.Increase road network across the country	**1.1 Physical Progress (in Km)**	km		Uniform and efficient dispersal of traffic on road network	Proportion of length of Single lane (SL)/ Intermediate Lane (IL) strategic / provincial roads of total length of roads	Reduce SL/IL roads to < 10% of total length by 2025.
		Ongoing Projects					
		……	km				
		……	km				
		……	km				
		……	km				
		……	km				

Financial outlay	**OUTPUTS 2019-30**				**OUTCOMES 2019-30**		
2019-30	Outputs 2019-30	Indicator (s)					
			Unit	Target for 2019-30	Outcome	Indicator (s)	Target
		Sub Total (ongoing projects)	km				
		Grand Total	km				
		1.2 Physical Progress (in lane-Km)			Uniform and efficient dispersal of traffic on road network	Proportion of length of Single lane (SL)/ Intermediate Lane (IL) strategic/provincial roads of total length of roads.	Reduce SL/IL roads to < 10% of total length by 2025.
		.Ongoing Projects	km				
		……..					
		……..	km				
		……	km				

Financial outlay	**OUTPUTS 2019-30**				**OUTCOMES 2019-30**		
2019-30	Outputs 2019-30	Indicator (s)					
			Unit	Target for 2019-30	Outcome	Indicator (s)	Target
		Sub Total(Other Schemes)	km				
		Grand Total	Km				
		1.3. Number of projects delayed	Nos.		Streamlining of pre-construction activities and project implementation.	Maximum delay for project	Reduction in maximum delay for project completion to 1 years; average-6months.
		1.4 Projects awarded- 1.4 (a). **nos**.	Nos.				
		1.4.(b).**Length**	km				
	2.Improved quality and maintenance of road network	2.1. **Technology usage (ROMDAS or equivalent technology) for completed road network.**	km		Improvement in overall road condition.	ROMDAS, etc., run on	ROMDAS, etc. run on at least …….km fully
		2.2. **Road network**	km				

Financial outlay	**OUTPUTS 2019-30**				**OUTCOMES 2019-30**		
2019-30	Outputs 2019-30	Indicator (s)					
			Unit	Target for 2019-30	Outcome	Indicator (s)	Target
		undergoing maintenance (Periodical Renewal / improvement in riding quality)				strategic/provincial length	completed road project by …….
	3.Improved connectivity in backward districts	3.1.**Number of districts connected**	Nos.		Establishing connectivity with backward areas.	Projects developed (in km) connecting identified districts.	…… districts to be connected by ….. Km for total length of Provide connectivity to backward, poorly affected areas for ushering in socio-economic development and integration with mainstream.

Financial outlay	**OUTPUTS 2019-30**				**OUTCOMES 2019-30**		
2019-30	Outputs 2019-30	Indicator (s)					
			Unit	Target for 2019-30	Outcome	Indicator (s)	Target
		3.2 **Length (in km) of projects for award connecting such districts**	km				
	4.Improved connectivity in religious areas	4.1.Length (in Km)of projects awarded;	km		Providing all weather improved connectivity for religious areas	The total length to be developed	The total length of …m to be developed by …..
		4.2.Length (in km)completed;	km				
		4.3. Lane length (in Km) completed.	km				
	5.Development of wayside amenities/ facilities for passengers	5.1.Number of wayside amenities developed	Nos.				

Financial outlay	**OUTPUTS 2019-30**				**OUTCOMES 2019-30**		
2019-30	Outputs 2019-30	Indicator (s)					
			Unit	Target for 2019-30	Outcome	Indicator (s)	Target
	6. Creative Initiatives	6.1.Total number of toilet blocks developed at Toll Plazas;	Nos.		Improvement and Provision of wayside amenities / facilities for passengers	(I) Wayside amenities; (II) Toilet blocks; (III) Highway Nests.	
		6.2 .Highway Nest with facilities like- litter bins, kiosk, water ATMs, paved parking area on up / down side from Plazas (at 200 meter distance)	Nos.				
	7.Enabling electronic toll collection	7.1.Number of toll plazas having E-tolling technologies in at least one lane in each side;			Reduction of congestion/waiting time in toll plazas	Reduction in average waiting time to 3 minutes maximum.	Increasing the adoption of E-tolling technologies such as (RFID).

Financial outlay	**OUTPUTS 2019-30**				**OUTCOMES 2019-30**		
2019-30	Outputs 2019-30	Indicator (s)					
			Unit	Target for 2019-30	Outcome	Indicator (s)	Target
		7.2. Radio Frequency Identification (RFID) Tags issued (in Lakh).	Nos.				
	8.Road Safety	8.1.Number of black spots rectified	Nos.		Enhancement of safety	Reduction in accidents-injuries,fatalities.	Improving Road safety through various measures such as reduction in black spots
	9.Public Private Partnership (PPP)Amount of money invested by Concessionaires	9.1.BOT(Toll) Projects	NRs. Crore		Enhance private sector participation in Road Projects	a. Total Amount (in crores) raised from Private Players in	a. Increased private sector participation in road projects under following categories:-
		9.2.BOT(Annuity) projects	NRs. Crore				

Financial outlay	**OUTPUTS 2019-30**				**OUTCOMES 2019-30**		
2019-30	Outputs 2019-30	Indicator (s)					
			Unit	Target for 2019-30	Outcome	Indicator (s)	Target
	in NH development under PPP Projects under following categories;-	9.3.Hybrid Annuity Model (HAM)Projects	NRs. Crore			various road project b. Amount of money invested by Concessionaires in NH development under PPP projests under following categories:- BOT(Toll)projects BOT(Annuity)project Hybrid Annuity Model(HAM) Projects	1.BOT (Toll)projects 2.BOT (Annuity) Projects 3.Hybrid Annuity Model (HAM)projects b. NRs. …… crore by ……

Financial outlay	**OUTPUTS 2019-30**				**OUTCOMES 2019-30**		
2019-30	Outputs 2019-30	Indicator (s)					
			Unit	Target for 2019-30	Outcome	Indicator (s)	Target
	10.Construction of Major Bridge works	10.1**Number of Major bridges built/Upgraded**	Nos.		Rehabilitation / Reconstruction of old and dilapidated bridges on Strategic/provincial roads	Re-construction\Rehabilitation of identified distressed bridge	Re-construction/ Rehabilitation of all the identified distressed bridges to be completed by ……
	11.Claims Resolved	11.1.Claims raised: 11.1.(a)Numbers;	Nos.		Dispute resolution as a means to facilitate faster implementation	Quicker and higher claim resolution to improve efficiency	
		11.1(b)Amount (in NRs crore)	NRs.crore				
		11.2.claims resolved:- 11.2.(a)Numbers;	Nos				
		11.2.(b)Amount (in Rs Crore)	NRs.crore				

2. Road Safety Cell

Financial outlay (Rs.In Cr.)	Outputs 2019-30			OUTCOMES 2019-30		
2019-30	**Output**	**Indicator(s)**	**Target 2019-30**	**OUTCOME**	**Indicator (s)**	**Target**
NRs. …… crore	1. Create Road safety awareness among the general public through various publicity measures.	1.1.Developing media strategy for Broadcast / Telecast of Road Safety messages on T.V, Radio FM Channel, Cinema halls etc.	Preparation of Road Safety Advocacy Media plan to run campaign for creating the Road Safety Awareness	Reduction of no.of road accident fatalities and increased awareness about road safety.		10% reduction in road fatalities and accidents significantly by increasing road safety awareness among public through all means of communication.
		1.2. Number of events / seminars / exhibitions etc organized relating to Road Safety.	Conducting road safety events / seminars / exhibitions regularly			
		1.3 Number of NGOs partnered with to create awareness on road safety	Involvement of around 200 NGO for creating awareness about road safety			

Financial outlay (Rs.In Cr.)	Outputs 2019-30			OUTCOMES 2019-30		
2019-30	Output	Indicator(s)	Target 2019-30	OUTCOME	Indicator (s)	Target
		1.4 Number of cranes and ambulances provided to provinces/ local level for relief and rescue measures in the aftermath of accidents	Fund allocation for procurement of ….. Cranes and ……. Ambulance.			
	2.Conduct Refresher Training of drivers in Un-organized sector and human resource development	2.1 number of training for drivers of unorganized sectors are imparted and Number of drivers trained	Refresher training to ……. drivers			
	3. Setting up and operationalizi	3.1. Number of Inspection and	Sanction of ….. I & C Centre			

Financial outlay (Rs.In Cr.)	Outputs 2019-30			OUTCOMES 2019-30		
2019-30	Output	Indicator(s)	Target 2019-30	OUTCOME	Indicator (s)	Target
	ng of vehicle inspection centres.	Certification Centre set up				
		3.2. Number of Inspection and Certification Centre operationalized	Faster setting up and operationalization of Inspection and Certification Centre.			
		3.3.Number of vehicles inspected in Inspection and Certification Centre				
	4.Setting up of Institute of driver Training and Research	4.1. Progress (physical and %) of completion of institute of Driving Training and Research.	Sanction of …. IDTR, …… Automated Driving Testing Track and ….. small Driving Center			

Financial outlay (Rs.In Cr.)	Outputs 2019-30			OUTCOMES 2019-30		
2019-30	**Output**	**Indicator(s)**	**Target 2019-30**	**OUTCOME**	**Indicator (s)**	**Target**
	5.Imparting training to Government officials	5.1.Number of training programme for Governments transport department officials and Number of officials trained	Increase training programmes and their coverage for stakeholders.			

3. Public Transport System Financial outlay (Rs.In Cr.)	Outputs 2019-30			OUTCOMES		
2019-30	**Output**	**Indicator (s)**	**Target 2019-30**	**OUTCOME**	**Indicator(s)**	**Target**
	1.A) Strengthening Public transport - Provide financial assistance to State Govt for use of latest technologies (GSM	1.1 Number of proposals received from the Governments for sanction	Strengthening of Public Transport through adoption of various technologies (GSM / GPS vehicle tracking, reservation system,	.1. To improve fleet management with induction of vehicle tracking devices. 2. To improve women safety and security by installation of CCTV Cameras in Public transport	Number of vehicles with vehicle tracking devices	Enhanced fleet management using technology.

	/GPS, vehicles tracking, reservation system, passenger information system) B) Sanction of projects for technological equipment and/or technologies purchased	1.2 Amount Sanctioned in respect of proposals approved (current and during previous years)	passenger information system)			
	2. To promote electronic ticketing for digital transactions.	2.1.Number and Amount (Value in Rupees) of e-tickets purchased	Improved uptake of digital payments	To create a user friendly system for ticketing	Number of ticketing machine installed, number of buses covered.	To promote Digital transactions.

4. National Database Network and Transport Studies

Financial outlay (Rs.In Cr.)	Outputs 2019-30			OUTCOMES		
2019-30	**Output**	**Indicator(s)**	**Target 2019-30**	**OUTCOME**	**Indicator(s)**	**Target**
	1. Digital Initiatives in Vehicles Registration, Licenses and Ticketing.	1.1 Number of cars with digital licenses and % coverage (i.e. Cars covered / total cars universe) covered under Digital Registration 1.2 Number of licenses issued digitally	Enhanced digitalization of offered services.	Digital enabled Regional Transport Offices (RTOs)	Number of RTOs upgraded	Increase the number of digitally enabled RTOs
	2.More options for e-payment, SMS intimations	2.1.Number of online transactions for applying for driving licenses ,other facilities like Change of address, NOC, vehicle fitness fee payment, permit fee payment	Facilitation of digital transactions	Increase number of people seeking transport services online	Number of users seeking transport related service online.	Increase the usages of online transport services.

ANNEX D: Steps in Propensity Score Matching (PSM)

The aim of matching is to find the closest comparison group from a sample of nonparticipants (non-road communities) to the sample of program participants (communities with road). "Closest" is measured in terms of observable characteristics. If there are only one or two such characteristics then matching should be easy, but typically there are many potential characteristics. The main steps in matching based on propensity scores are as follows.

Step 1: You need a representative sample of eligible nonparticipants as well as one for the participants. The larger the sample of eligible nonparticipant communities the better, to facilitate good matching

Step 2: Pool the two samples and estimate a probit or logit model of participation in the road project as a function of all variables in the data that are likely to determine participation.

Step 3: Create the predicted values of the probability of participation from the estimated re-gression; these are the propensity scores. There is a propensity score for every sampled participant and nonparticipant community.

Step 4: Some communities in the nonparticipant sample may have to be excluded at the outset because they have propensity score that is outside the range (typically too low) found for the treatment sample. The range of propensity scores estimated for the treatment group should correspond closely to that for the retained subsample of nonparticipants. If the road program covers a very large area, for example, it may be national in scope, it is quite likely that propensity scores may not match. In that case, improved matching can be achieved by splitting the sample according to geographic location.

Step 5: For each community in the treatment sample, find the observation in the nonparticipant sample that has the closest propensity score, as measured by the absolute difference in scores. This is called the "nearest neighbor". You will get more precise estimates if you use,say,the nearest five neighbors.

Step 6: Calculate the mean value of the outcome indicator (or each of the indicators if there is more than one) for the five nearest neighbors. The difference between that mean and the actual value for the treatment observation is the estimate of the gain due to the program for that observation.

Step 7: Calculate the mean of these gains for each observation (community) to obtain the average overall gain. This can be stratified by some variable of interest, such as village size, in the nonparticipant sample.

ANNEX E: Scoring System for Performance Evaluation of Implementing Agency in case of Rural Roads

Evaluation criteria	Maximum Score	Very Good	Good	Satisfactory	Marginal	Poor
1. Planning and Budgeting	*10 points*					
1.1 Annual Road Investment and Maintenance Program with road inventory, maintenance prioritization, and budget.	*4 points*	Very Good *4 points*	Good *3 points*	Satisfactory *2 points*	Marginal *1 points*	Poor *0 points*
1.2 Multiyear rolling plan with priorities	*3 points*	Very Good *3 points*	Good *2 points*	Satisfactory *2 points*	Marginal *1 points*	Poor *0 points*
1.3 Timely submission	*3 points*	Very Good *3 points*	Good *2 points*	Satisfactory *1 points*	Marginal *1 points*	Poor *0 points*
2. Survey and Design	*10 points*					
2.1 Compliance with screening exercise	*3 points*	Very Good 3 *points*	Good 2 *points*	Satisfactory *1 points*	Marginal 1 *points*	Poor 0 *points*
2.2 Survey carried out with adequate horizontal and vertical controls and	*4 points*	Very Good *4 points*	Good *3 points*	Satisfactory *2 points*	Marginal *1 points*	Poor *0 points*
2.3 Timely submission of design and estimates	*3 points*	Very Good 3 *points*	Good *2 points*	Satisfactory *2 points*	Marginal *1 points*	Poor *0 points*
3. Procurement	*10 points*					
3.1 Compliance with SBDs and specifications	*2 points*	Very Good 2 *points*	Good *2 points*	Satisfactory *1 points*	Marginal *1 points*	Poor *0 points*
3.2 Compliance with rules	*3 points*	Very Good 3 *points*	Good *2 points*	Satisfactory *2 points*	Marginal *1 points*	Poor *0 points*

3.3 Timeliness	5 points	Award within 3 months	Award between 4 to 5 months	Award between 6 to 8 months	Award between 9 to 1o months	Award after 10 months
		5 points	4 points	3 points	2 points	0 points
4. Quality of Works	30 points					
4.1 Material tests		No of tests and quality comply with specifications QAP	60-80% QAP tests carried out	40-60% QAP tests carried out	30-40% QAP tests carried out	<30% QAP tests carried out
	5 points	5 points	4 points	3 points	2 points	0 points
4.2 Works quality as per specification	15 points	Meet design line, levels, finish, tested layered compaction (grader and roller used)	tested layered com-paction (roller used)	Minimal layer compaction	inadequate compaction (roller used)	no roller used
4.3 Compliance with Implementation Modality (technical, social, environmental)	10 points	Very Good 10 points	Good 8 points	Satisfactory 5 points	Marginal 3 points	Poor 0 points
5 Work progress	10 points					
5.1 Maintenance Works	5 points	>80% 5 points	60-80% 4 points	40-60% 3 points	30-40% 2 points	<30% 0 points
5.2 Upgrading Works	5 points	>80% 5 points	60-80% 4 points	40-60% 3 points	30-40% 2 points	<30% 0 points
6 Compliance with Environmental and Social safeguards	5 points					

6.1 Timely and quality pre-investment studies, availability/ use of human and other resources/ services, and impact mitigations & management at site		Very Good	Good	Satisfactory	Marginal	Poor
7 Financial management quality	10 points					
7.1 Accounting records and documents properly maintained	4 points	Very Good	Good	Satisfactory	Marginal	Poor
		4 points	3 points	2 points	1 point	0 points
7.2 Timely reporting to higher authority	3 points	Every trimester	3 trimester	2 trimester	1 trimester	Never
		3 points	2 points	1 point	0 points	0 points
7.3 Nature of financial audit irregularities reported	3 points	<1% of the expenditures	1-2%	2-3%	3-5%	>5%
		3 points	2 points	1 point	1 point	0 points
8 Communication and Transparency	5 points					
8.1 Project information dissemination	2 points	> 3 public meetings	8 public meetings	8 public meetings	1 public meeting	no public meeting
		2 points	1.5 points	1 point	0.5 points	0 points
8.2 Project information hoarding boards and others	1 points	all sites	60-80% of the sites	40-60%	30-40%	<30%
		1 points	.7 points	.5 point	.25 point	0 points
8.3 Dissemination through radio, print and electronic media	2 points	All modes	Radio and Print	Print and Electronic	Any one	None
		2 points	1.5 points	1.5 points	1 points	0 points
9. Monitoring & Evaluations	10 points					

9.1 Oversight agencies field visit reports (timeliness and findings)	2 points	3 trimesters	2 trimester	1 trimester only	1 fair report	1 poor report
		2 points	2 points	1 point	1 points	0 points
9.2 Departmental evaluation (quality and timeliness)	5 points	3 trimesters	2 trimester	1 trimester only	1 fair report	1 poor report
		5 points	4 points	3 points	1 point	0 points
9.3 Independent Technical Audit Report findings	3 points	Very Good	Good	Satisfactory	Marginal	Poor
		3 points	2 points	1 point	0 points	0 points

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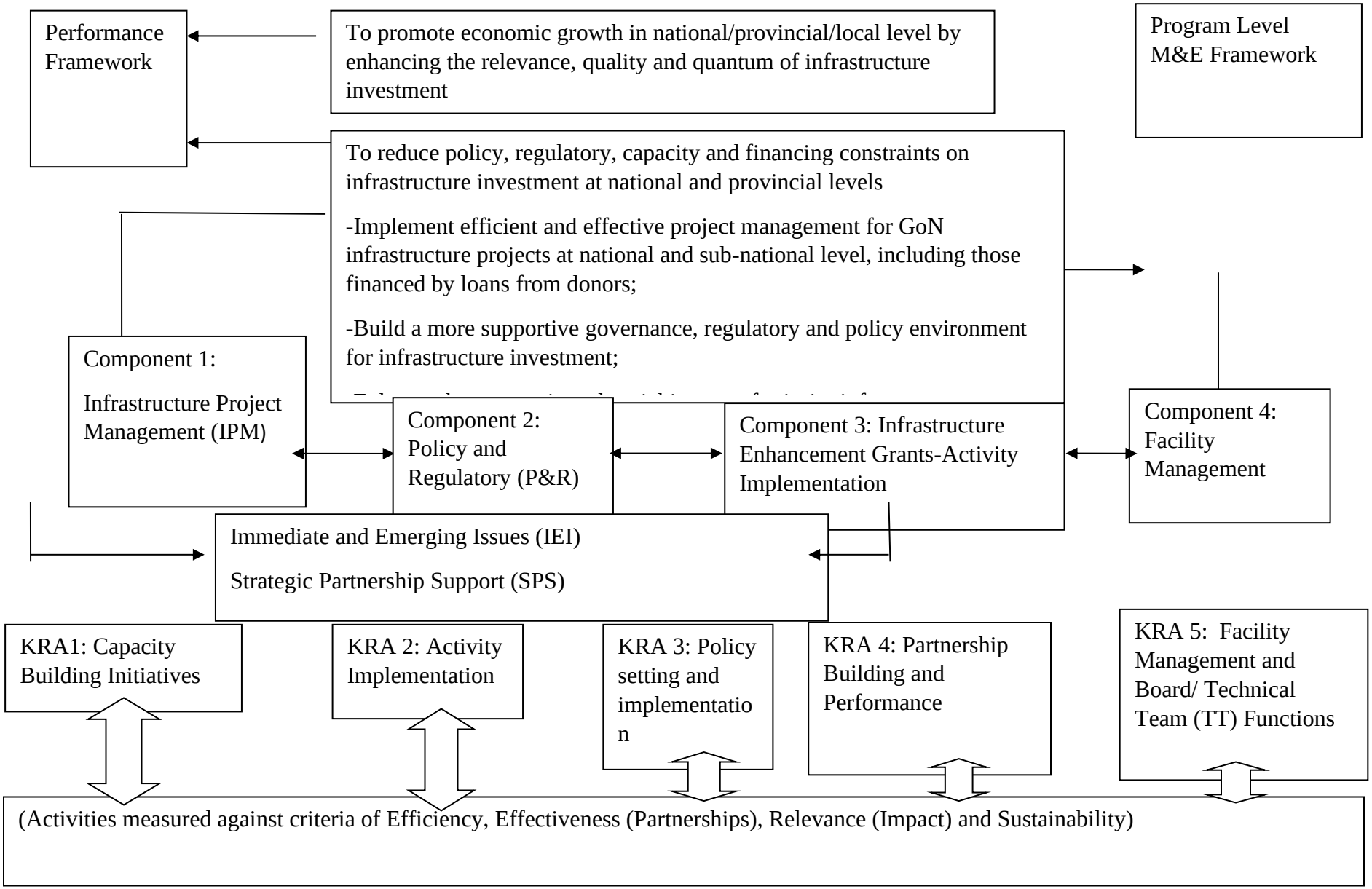
ANNEX F: Program Level Framework [Key Result Area (KRA)] in case of Donor Funded Transportation Projects



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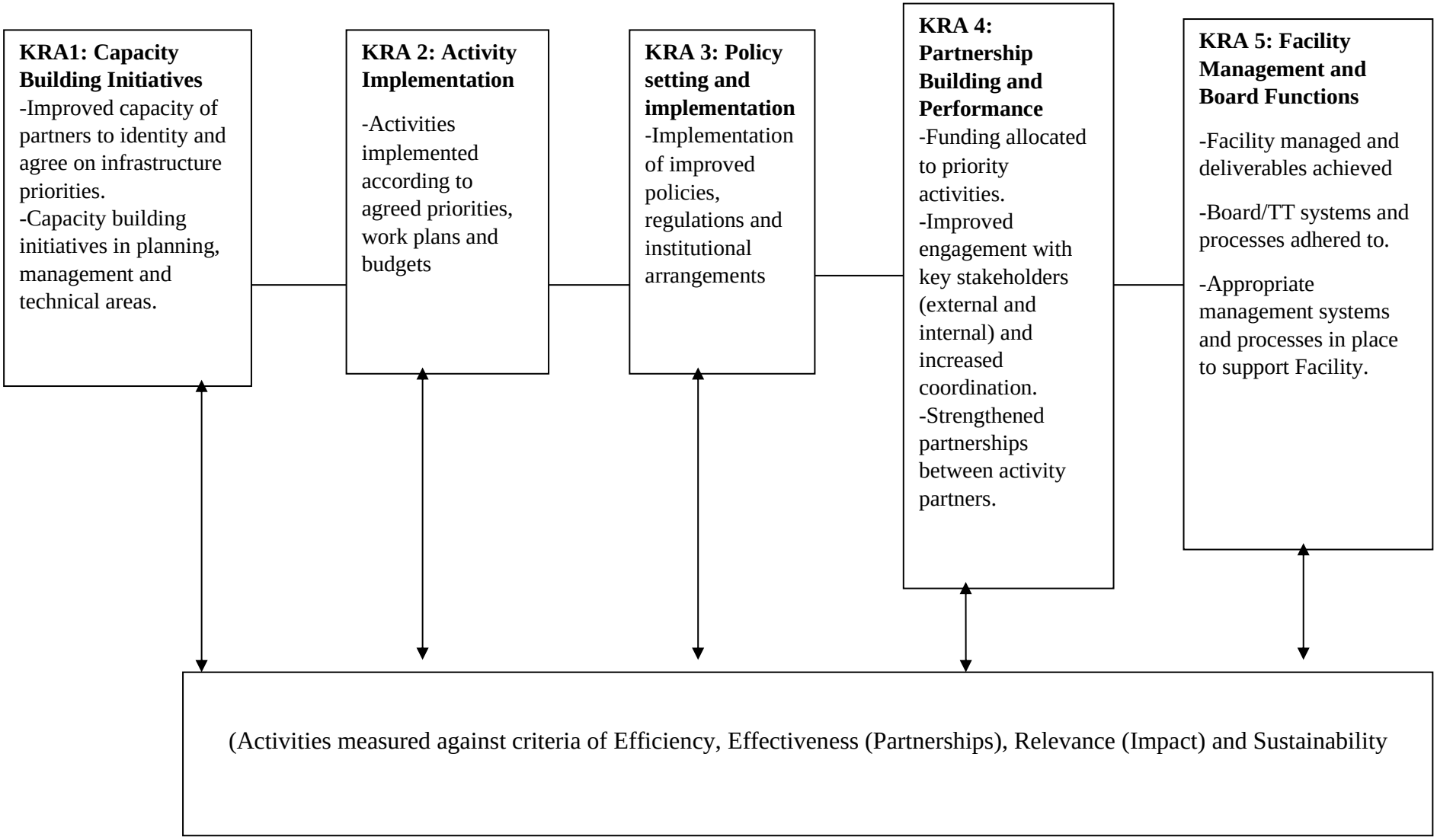


The tables below highlight a range of key performance questions to be used in assessing the achievement of higher order objectives/outcomes in the Program Level Framework. The Activity Level Framework and reports will collect specific information that will be consolidated to measure impact and change against the Program Level Framework and results can be aggregated up to measure impacts at the program level.

Key Result Area 1 : Capacity Building Initiatives
Performance Indicators: Improved capacity of partners to identify and agree on infrastructure priory activities. Capacity building initiatives in planning, management and technical areas.
Performance Questions: Is there agreement on all infrastructure priorities? Do partners agree on priority sectoral areas for work? Have partners made improved choices in selecting activities to implement? Do partners demonstrate strengthened capacity to set strategic direction? Are activities with capacity building elements contributing to improved awareness regarding infrastructure investment and management?
Responsibility: Development Partners (Technical Team included) are responsible for the selection of sectoral infrastructure activities based on agreed priorities and work plans. The Government Offices are required to help partners improve capacity, particularly for infrastructure investment and management.
Process: Interaction between technical team representative and Government (ministerial/departmental) technical directors. Consultations at scheduled board meetings. There will also be a review of activities on the Activities Database that have specific capacity building outputs and objectives.

Key Result Area 2 : Activity Implementation
Performance Indicators : Activities implemented according to agreed priorities,workplans and budgets
Performance Questions: Do development partners understand their roles and responsibilities as active participants in the selection of agreed activities? Have the right activities been selected in accordance with priorities? Have all activities, in the main, met agreed objectives and deliverables?
Responsibility: Activity selection criteria are the central theme to be measured here. Responsibility lays with the Board/TT and government (ministerial/departmental) management to ensure activity selection are consistent and align to agreed priorities and also that resource allocation between sectors and thematic areas is appropriate.
Process: Interaction between technical team representative and Government (ministerial/departmental) technical directors. Consultations at scheduled board meetings. Review activities on the Activity Database that have specific outputs and objectives.

Key Result Area 3 :Policy Setting and Implementation
Performance Indicators : Implementation of improved policies, regulations and institutional arrangement
Performance Questions: Have agreed policy and regulatory reforms been implemented? Has the program prioritized certain model based projects (PPP, BOOT, BOT, EPC etc)? Have financing arrangements improved? Has policy reviews and regional planning processes

improved? Have reforms contributed to improved efficiencies and decision-making processes with development partners?
Responsibility: NPC is responsible for the management of activities that directly relate to policy and regulatory reforms. Development partners are responsible for the ongoing reform process and the development and/or adjustment of policies in light of the reform process.
Process: Consultation between technical team and NPC on priority areas for regulatory reform and strategies to link reform to policy improvements. Specific results from departmental TA will be assessed through the activity level M&E which will provide information for reporting at the program level.

Key Result Area 4 : Partnership Building and Performance
Performance Indicators: Funding allocated to priority activities. Improved engagement with key stakeholders (external and internal) and increased coordination. Strengthened partnerships between activity partners.
Performance Questions: Has development partners facilitated the creation of new partnerships and strengthened existing ones? Are the sufficient resources available to promote partnership development? What influence has improved partnership had on activity quality? Have partnerships created opportunities for new engagements and interactions external to NPC? Does coordination group promote activity partnerships?
Responsibility: Development partners are responsible for identifying and exploring new partnership opportunities. Government (ministerial/departmental) responsibilities are to facilitate and encourage partnership formulation and development.
Process: Development partners to discuss partnership options and assess quality of partnerships during reporting phases.

Key Result Area 5 : Facility management and TT functions
Performance Indicators: Facility managed and deliverables achieved by TT systems and processes adhered to? Appropriate management systems and processes in place to support facility.
Performance Questions: Are activity components, objectives and the MEF still relevant? Is the purpose and objective of the program still consistent and appropriate? Are resources being allocated appropriately? Is there adequate feedback and communication among Government (ministerial/departmental) offices, donors and NPC management? Are NPC's internal management processes sufficient? Are activities adhering to the agreed selection criteria? Is there evidence of ongoing improvements to management processes and are good relations with development partners being maintained? Are existing plans/policies being applied to all development activities? Is the risk management strategy relevant ad appropriate to Facility management?
Responsibility: Responsibility lays with implementing partners to provide appropriate feedback on their perceptions of the program. The NPC will also be responsible for reviewing management performance at agreed reflection events during the course of each year**.**
Process: Annual review of activities and annual reflection event. IAT to undertake review in close co-ordination with the development partners. A specific external evaluation could be considered where relevant and appropriate request for feedback from activity implementers on NPC performance.

ANNEX G: Activity Level M&E Framework

Activity Goal			Performance Indicators	Activity Inputs	Means of Verification	Critical Assumptions	Activity Criteria Efficiency, Effectiveness (Partnerships), Relevance (Impact) and sustainability
	Capacity Building Initiatives	Strategic Objective 1					
		Intermediate Result 1.1					
	Activity Implementation	Strategic Objective 2					
		Intermediate Result 2.1					
	Policy Setting And Implementation	Strategic Objective 3					
		Intermediate Result 3.1					
	Partnership Building and Performance	Strategic Objective 4					

G. Criteria	Sample key performance questions for Activities
Efficiency	Have the stated outputs of the activity been achieved against the original activity objective? How well is the implementation of activities managed? Has the partner/counterpart managed the activity effectively?
Effectiveness	Has the activity achieved its stated objective and key deliverable within the agreed timeframe? Were all outputs relevant in achieving the desired activity outcome? If not, could the outputs have been reduced or refined to achieve the same outcome?
Impact	Are there any negative impact – if so can they be minimized? Are there any positive impacts – if so can they be maximized? To what extent has this activity contributed towards the broader program objectives and key result areas? Have effective partnerships been established as a result of the activity
Relevance	Are the project goal and outcomes consistent with and supportive of GoN policies and priorities? Does the results framework clearly show how activities will achieve results and impact? Has the design and proposal been supported by key stakeholders Have a relevant cross-cutting themes and issues been taken in to account and mainstreamed across the activity?
Sustainability	Is the activity financially and/or technically sustainable? What is the level of ownership of the activity by local partners and will the activity continue forever? What is the level of support provided and the degree of interaction between the activity and policy level? How well is the activity contributing to institutional and management capacity?

ANNEX H: Standard Reporting Procedure

1. PURPOSE

The purpose of this standard reporting procedure is to outline reporting procedure by departmental programmes to Executive Authority, stakeholders and to NPC on public works. The procedure will also outline reporting timeframes.

2. SCOPE

The reporting procedure applies to all public works programmmes undertaken by Governmental/Public Department.

3. LEGISLATIVE AND POLICY MANDATE

In terms of financial reporting, Financial Procedures Act, 2055 (1999) and its Regulations, 2056 (2000) stipulates that the accounting officer of an institution must establish procedures for quarterly reporting to facilitate effective performance monitoring, evaluation and corrective action. The Framework for Strategic Plans and Annual Performance Plans outlines the links between the various accountability documents that institutions are required to produce at each stage of the planning, budgeting, implementation, reporting, monitoring and evaluation cycle. It focuses on the generic content of Strategic Plans and Annual Performance Plans and the timeframes for their production.

4. REPORTING PROCEDURE

(a) The reporting procedure starts with the submission of reports by programmes to Strategic Planning sub-programme for consolidation. Monthly reports will be consolidated in line with the Operational Plan (OP) and Quarterly reports will be consolidated in line with the Annual Performance Plan (APP). Electronic and signed copies of reports should be submitted to Strategic planning. Signed reports should be filed by both Strategic Planning and the respective programme.

(b) The reports will be analysed and presented to management by the monitoring and Evaluation sub-programme. Data presented will be verified for accuracy and the relevant programmes will be engaged to effect any changes. The verified reports will be submitted to Executive Authority and stakeholders i.e. Department, Ministry on Public Works and after all means of completion finally submitted to NPC on prescribed dates.

(c) The Monitoring and Evaluation sub-programme will organize quarterly performance review sessions attended by Programme Managers/ Senior managers, HoD and NPC.

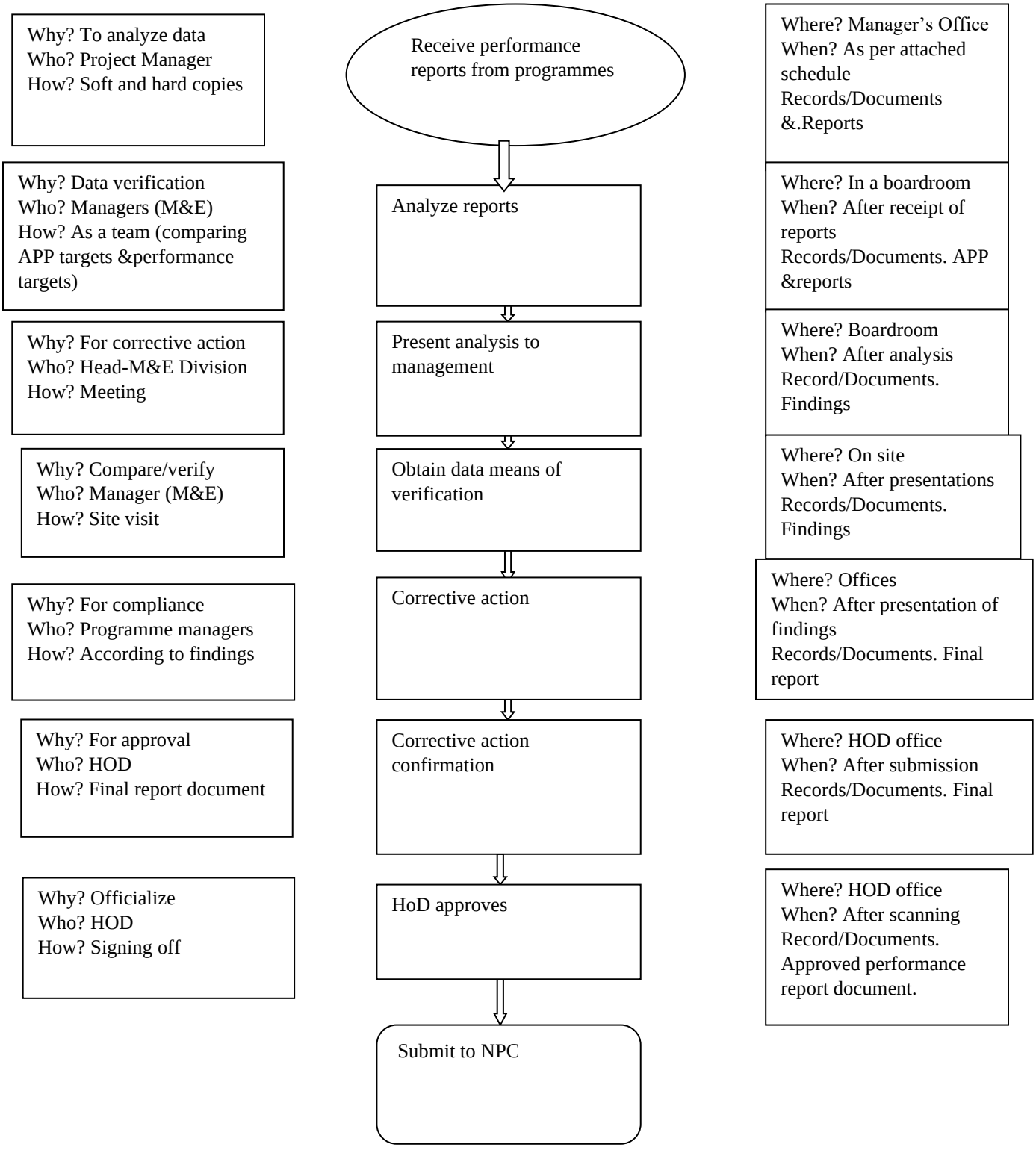
(d) The process flow is shown in Fig. H-1.

5. EXTERNAL REPORTING TIMEFRAMES

Treasury issues submission dates of quarterly performance reports on an annual basis to departments. The Department has compiled a schedule of reporting dates in line with dates determined by Treasury. This Schedule takes in to consideration time required by the Monitoring

and Evaluation sub-programme to collect and consolidate the reports in time to adhere to Treasury reporting timeframes.

Fig.H-1 Reporting Procedure that applies to all public works programmmes undertaken by Governmental/Public Department



ANNEX-I: Glossary of Terms

Some of the more important definitions from this glossary are given below:

Activities: Activities are the set of various actions executed by project personnel to convert resources to the specific outputs as defined by a programme or project.

Plan: A plan is an outline of programmes and activities designed on the basis of past learning as well as current needs and sustainability prospects, so as to bring about qualitative changes in the lives of people by means of socio-economic development.

Programme: A programme is the collection of projects, operational systems and services which are geared towards achieving objectives of a plan and may cut across sectors, sub-sectors, or thematic areas.

Project: A project is a collection of interdependent and coordinated activities geared towards achieving the particular objective of a plan or policy within a predetermined budget and time schedule.

Business Plan: The business plan is a sectoral plan which has been prepared based on the assigned duties or responsibilities of the concerned public agencies; goals and objectives of the periodic plans; and the principles and tools of Managing for Development Results (MfDR) so as to achieve optimum outputs from the available resources.

Monitoring: Monitoring is the process of keeping track by management at different levels of hierarchy or the individual or agency entrusted by the management, on a continuous or periodic basis, of the inputs and resources meant for the implementation of plans, policies, programmes, and projects are being properly delivered; and the verification of whether the project activities are being implemented and where the intended outputs achieved as per the plan and schedule.

Outcome: An outcome is the change or effect in development conditions produced by the project outputs.

Output: The products, goods, and services that result from the inputs invested in development programmes or projects.

Participatory Monitoring: The monitoring carried out by the beneficiaries and representatives of agencies and stakeholders related to the programme or project.

Evaluation: Evaluation is a systematic and purposeful undertaking carried out by internal or external evaluators to appraise relevance, effectiveness, efficiency, impacts as well as sustainability generated by the policies, plans, programmes, and projects under/after implementation.

Ex-ante Evaluation: The act of carrying out appraisal before making investment in a project or programme so as to ensure its relevance and need.

On-going Evaluation: An assessment undertaken during the implementation phase of a programme project to analyze the continued relevance, effectiveness, efficiency, impact and sustainability of the programme/project so as to improve or reorient its design and implementation if necessary.

Terminal Evaluation: A study conducted at the end of an intervention (or at the end of a phase of that intervention) to analyze and determine its efficiency, impact and sustainability to obtain inputs or suggestions for future courses of action.

Impact Evaluation: A type of outcome evaluation carried out a few years after the completion of a programme or project to analyze and evaluate its impacts and sustainability so as to obtain feedback for the formulation of similar programme or project in future.

Impact: The actual or intended changes brought about in the life and wellbeing of targeted beneficiaries by the outputs of a plan, policy, programme, or project.

Investment: The input of funds, materials, human resources, services, technologies, and other resources which are used to carry out programme and project activities so as to achieve their objectives.

Reliability: It is a measure of consistency and a respondent is regarded as reliable if their answers are the same for the repeated questions

Logical Framework (Log Frame): Log Frame is a planning and management tool that summarizes goals, objectives, outputs, and activities of a programme or project along with their causal linkages. Also included are indicators of performance and means for their verification in a single matrix.

Medium-term Expenditure Framework (MTEF): MTEF is the schema for prioritizing development programmes with a view to improve the process of programme/project formulation and implementation; to improve the effectiveness of development programmes; and to ensure clear budgets for the programmes and projects that are critical to the achievement of goals and objectives of periodic plans.

Attrition: Attrition refers to either the number or % of participants who have dropped out from the treatment group during the intervention, or a failure to collect data from a unit in subsequent rounds of a panel data survey. Either form of attrition can result in biased impact estimates.

Baseline survey and baseline data: A survey to collect data prior to the start of the intervention. Baseline data are necessary to conduct double difference analysis, and should be collected from both treatment and comparison groups.

Comparison Group: A group of individuals whose characteristics are similar to those of the treatment groups (or participants) but who do not receive the intervention. Under trial conditions in which the evaluator can ensure that no confounding factors affect the comparison group it is called a control group.

Counterfactual: The state of the world in the absence of the intervention. For most impact evaluations the counterfactual is the value of the outcome for the treatment group in the absence of the intervention. However, studies should also pay attention to unintended outcomes, including effects on non-beneficiaries.

Double difference: The difference in the change in the outcome observed in the treatment group compared to the change observed in the comparison group; or, equivalently, the change in the difference in the outcome between treatment and comparison. Double differencing removes selection bias resulting from time-invariant unobservables. Also called Difference-in-difference. Compare to single difference and triple difference.

Impact heterogeneity: The variation in impact as a result of differences in context, beneficiary characteristic or implementation of the intervention.

Matching: A method utilized to create comparison groups, in which groups or individuals are matched to those in the treatment group based on characteristics felt to be relevant to the outcome(s) of the intervention.

Panel data and panel survey: Data collected through consecutive surveys in which observations are collected on the same sample of respondents in each round. Panel data may suffer from attrition, which can result in bias.

Propensity Score Matching (PSM): A quasi-experimental design for estimating the impact of an intervention. The outcomes for the treatment group are compared to those for a comparison group, where the latter is constructed through matching based on propensity scores. The propensity score is the probability of participating in the intervention, as given by a probit regression on observed characteristics. These characteristics must not be affected by the intervention. PSM hence allows matching on multiple characteristics, by summarizing these characteristics in a single figure (the propensity score).

Quasi-Experimental Design: Impact evaluation designs used to determine impact in the absence of a control group from an experimental design. Many quasi-experimental methods, e.g. propensity score matching and regression discontinuity design, create a comparison group using statistical procedures. The intention is to ensure that the characteristics of the treatment and comparison groups are identical in all respects, other than the intervention, as would be the case from an experimental design. Other, regression-based approaches, have an implicit counterfactual, controlling for selection bias and other confounding factors through statistical procedures.

Randomized Controlled Trial (RCT): An impact evaluation design in which random assignment has been used to allocate the intervention amongst members of the eligible population. Since there should be no correlation between participant characteristics and the outcome, and differences in outcome between the treatment and control can be fully attributed to the intervention, i.e. there is no selection bias. However, RCTs may be subject to several types of bias and so need follow strict protocols. Also called Experimental design.

Sampling frame: The complete list of the population of interest in the study. This is not necessarily the complete population of the country or area being studied, but is restricted to the eligible population, e.g. families with children under five, or female –headed households. For a facility survey, the sampling frame would be all facilities in the area of study. If a recent sampling frame is not available then one needs to be constructed through a field-based listing.

Spillover effects: When the intervention has an impact (either positive or negative) on units not in the treatment group. Ignoring spillover effects results in a biased impact estimate. If there are spillover effects then the group of beneficiaries is larger than the group of participants. When the spillover affects members of the comparison group, this is a special case of contagion.

Unobservables: Characteristics which cannot be observed or measured. The presence of unobservables can cause selection bias in quasi-experimental designs, if these unobservables are correlated with both participation in the programme and the outcome(s) of interest.

Public Audit: Public audit is an event organized to inform the stakeholders about the goals, objectives, and budget, as well as the results, outputs, and expenditure associated with plans, policies, programmes, and projects executed by public agencies.

Public Expenditure Tracking Surveys (PETS): PETS are the tools used to track the flow of public funds and determine the extent to which resources actually reach the target groups. They do this by examining the manner, quantity, quality, and timing of the release of resources to different levels of the system and ensure that the flow of resources to the programme and project levels by analyzing and addressing their causes.

Results-based Management: A management strategy that focuses on the processes, products and services contributing to the achievement of development results.

Social Audit: Social audit is a process in which all of the activities and performances of a service delivery agency are examined, assessed and analyzed with direct involvement and participation of a wide range of stakeholders to determine the extent to which the implementation of given plan, policy, programme or project has contributed to overall socio-economic development.

Technical Audit: The process of assessing the performance of infrastructure projects so as to see whether they are constructed in compliance with the predetermined design, technology, cost estimate, and materials.

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