EVIDENCE BASED ADAPTATION

A Framework for Monitoring and Evaluation (M&E) of Climate Change Adaptation Projects in India

THERE WAS A TIME WHEN CLIMATE CHANGE WAS A SERIOUS THREAT IN THE FUTURE. THAT TIME IS GONE. THE FUTURE IS HERE AND NOW.

WHY M&E?

India is extremely susceptible to the vagaries of climate change. It's largely rural population, a majority of it poor, is dependent for livelihood on the most climate sensitive sectors like agriculture, forests, tourism, animal husbandry, fisheries etc. The fate of these sectors depends on the rainfall and temperature regimes, both of which are climate change's first casualties. Climate change affects water availability, that in turn has a domino effect on food & energy security, and biodiversity, leaving the poor most exposed to the fallout. It is therefore essential to increase the capacity of these vulnerable communities to adapt to the present and future climate changes.

Each adaptation project has an individual set of results that encompass its outputs and outcomes. These are monitored and evaluated by a third party using a pre-defined set of indicators and criteria. Due to this, the availability of a standalone framework for M&E is lacking making adaptation measures and its contribution to evidence-based decision-making a key challenge. Therefore, an M&E system is essential for monitoring and evaluating the adaptation outputs and outcomes being implemented at the local and state levels and aggregating them at the national level for estimating its contribution towards each country Nationally Determined Contributions (NDCs).

Moreover, India as a signatory of the Paris Agreement on Climate Change that insists on "monitoring, evaluating and learning from adaptation plans, policies, programmes and actions for each country (Art. 7; para. 9)," is bound to enumerate and report its national adaptation effort. Monitoring and evaluation (M&E) not just bring accountability to development programs, but more importantly act as a tools for course correction, for scaling and replicating projects, and drive higher return on investment, all by their virtue to learn from the adaptation projects and inform policy making. M&E make adaptation an evidence-based exercise.

ARTICLE 7, PARAGRAPH 9D OF THE PARIS AGREEMENT ON CLIMATE CHANGE STATES THAT MONITORING, EVALUATING AND LEARNING FROM ADAPTATION PLANS, POLICIES, PROGRAMMES AND ACTIONS FOR EACH COUNTRY IS ESSENTIAL

HOW TO DO IT

- For an economy to guard against climate-change risks by adapting to the changes while contributing to sustainable development, first requires recognizing the specific areas, or thematics, of the economy at risk, such as, Agriculture, Horticulture, Water, Animal Husbandry, Health, and Biodiversity/Forestry.

- Then the details are worked out of the interventions required within each thematic. For instance, risks to the thematic of 'Agriculture' can be dealt with the following projects or interventions by basically addressing the core concerns within the thematic in an informed, holistic way, such as 'Developing Capacity in Research and Extension', 'Promoting understanding of Climate Change among stakeholders', 'Soil conservation for improvement of soil and water regime', 'Water harvesting and Management,' and 'Enhancement of agricultural productivity through implementation of innovative agricultural best practices.'

- Each of these projects generates specific indicators that together amount to aggregate indicators from the thematic as a whole. Both the thematic- and project-level indicators are identified by studying sector-specific climate change initiatives under India's National Action Plan for Climate Change (NAPCC).

- The project-level indicators together create a robust logical framework that can generate sector- or macro-level indicators that measure the performance of adaptation interventions within a sector based on a sound socio-economic-ecological framework.

- The macro-level indicators taken together become 'Aggregate Indicators,' the big picture, giving a detailed account of efficacy of adaptation projects from individual to the sector-level interventions that allows result-based monitoring and evaluation (M&E) of national, state, and local CCA interventions. The project, therefore, is the basic brick in this aggregation chain, the key step towards developing a comprehensive framework for M&E of CCA actions in India.

- The indicators for this study have been categorized under two broad dimensions – Adaptive Capacity and Adaptation Actions. Some Adaptive capacity indicators that were identified are "percentage of farmers benefiting from weather-based advisories" and "the percentage of government line department employees to have undergone training in adaptation measures."

PROJECT LEVEL
household, community of a location

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SECTOR LEVEL
National Mission for Sustainable Agriculture/ National Water Mission

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NATIONAL / POLICY
National priorities under NAPCC, NDC and SDG Indicators and baseline

MACRO INDICATOR

AGRICULTURE & HORTICULTURE

Agriculture and horticulture are most widely affected by climate change. Most northern and western states in India have very low percentage of farmland that grows more than one crop. An increased level of diversification of crops can reduce the vulnerability and increase economic resilience. Initiatives like weather forecast advisories to address specific climate change risks can protect agricultural communities and improve productivity. Repeated crop failure leads to migration in large numbers, which is another aggregate indicator because an increase in migration points to a failure of initiatives to improve adaptive capacity of communities.

Last but not the least, being at the bottom of socio-economic pyramid, women are more vulnerable to climate change impact than men. Therefore, any CCA campaign will fail unless women are made equal partners in adaptation, implementation and change.

FORESTRY

Different tree types and have different sensitivity levels to climatic changes. Knowing how and why forest area changes over time is important because permanent losses and gains in forest area affect the long-term availability of resources and the provision of wildlife habitat and other ecosystem services.

Studies show that non-timber forest products can make a significant contribution to well-being and economic security of rural and forest-dwelling households. In the context of climate change adaptation, agro-forestry is playing a crucial role in enhancing livelihoods of people vulnerable to climate change. Through agro-forestry, trees can now be grown on farmland itself.

Further, women are more vulnerable to climate change risks than men. Increasing women participation in Joint Forest Management will provide them a greater decision making role.

WATER

Water is central to the effects of climate change felt by people, ecosystems and economies. Due to climate change, water resources are drying up in India. Economically well-off sections of the society deal with water scarcity by digging bore wells, but the economically marginalized resort to fetching water from common sources. Since the role of fetching water usually assigned to the women, this leads to poverty among women, gender based violence and affects the health and sanitation condition of women. Poor access to safe drinking water also increases the risk of water-borne diseases.

Surface water supply in India has been adversely affected due to climate change. Rainwater harvesting has become widespread option for improving ground water levels.

Healthy ground water levels in a region enable sustainable agricultural practices. 70–80 per cent of the value of irrigated production in India comes from groundwater irrigation. One of the key goals of the 'National Water Mission' in India is to improve water use efficiency by at least 20 per cent by 2017.

ANIMAL HUSBANDRY

Animal rearing provides important supplemental income to farmers, particularly in case of small and marginal farmers. In rural communities, fall in milk/meat yields or loss of livestock due to climate change can result in chronic poverty and poor nutrition levels. Women and their children are particularly dependent on small animal rearing for their nutritional and financial security.

It is important to encourage the breeding of hardier indigenous breed of cattle used to local climatic conditions rather than the cross-breeds that require more resources to survive. Cross-breeds are also considered to have larger environmental foot print for greenhouse gas emissions. Milk production level is easily hit by changes in temperature and humidity level.

Milk production is a reliable macro-indicator as of the efficacy of all the adaptive projects across the sector.
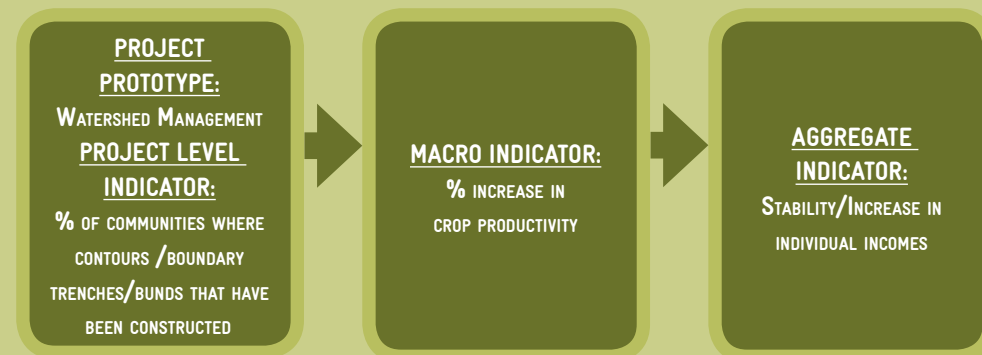
AGGREGATE INDICATORS

Aggregate indicators are aligned with the overall NDC/Climate Change Developmental goals of a country and provide a great basis for integrating CCA goals into development planning in a country and vice versa. They are:

1   STABILITY/INCREASE IN INCOME LEVELS OF INDIVIDUALS
2   HIGH PERCENTAGE REDUCTION IN MIGRATION OF LOCAL POPULATION DIRECTLY AND INDIRECTLY DEPENDENT FOR THEIR LIVELIHOODS ON CONCERNED SECTORS
3   ENHANCED CLIMATE RESILIENCE OF COMMUNITIES TOWARDS CLIMATE RISKS
4   MAINSTREAMING OF WOMEN AND OTHER VULNERABLE SECTIONS IN ADAPTATION ACTIVITIES
5   HIGHER PERCENTAGE OF INDIVIDUALS WHO HAVE DIVERSIFIED SOURCES OF INCOME
6   INCREASED PERCENTAGE OF FARMERS WHO HAVE BEEN CAPACITATED
7   RISE IN GROUND WATER LEVELS
8   NUMBER OF GOVERNMENT SCHEMES THAT HAVE BEEN CLIMATE PROOFED
7   RISE IN GROUND WATER LEVELS
8   NUMBER OF GOVERNMENT SCHEMES THAT HAVE BEEN CLIMATE PROOFED
9   PREFERENCE TO WOMEN SINCE THEY ARE AT THE BOTTOM OF THE SOCIO-ECONOMIC PYRAMID MAKING THEM VULNERABLE TO CLIMATE CHANGE.

A key project Prototype in both the Water and Agriculture sector is 'Watershed Management'. Within this prototype, an important project level activity is building contours/boundary trenches and bunds. This activity will stop runoff and sediment from agricultural land, leading to increased water availability.

As a result, the activity will lead to enhanced outputs for the farmer and percentage increase in crop productivity'. It will be representative of combined effects of several project level activities and, therefore, is a Macro Indicator.

PROJECT PROTOTYPE: WATERSHED MANAGEMENT PROJECT LEVEL INDICATOR: % OF COMMUNITIES WHERE CONTOURS /BOUNDARY TRENCHES/BUNDS THAT HAVE BEEN CONSTRUCTED → MACRO INDICATOR: % INCREASE IN CROP PRODUCTIVITY → AGGREGATE INDICATOR: STABILITY/INCREASE IN INDIVIDUAL INCOMES

CASE STUDY: TELANGANA

BACKGROUND: Telangana, situated in a semi-arid region, has a hot and dry climate. Mahbubnagar district has the lowest adaptive capacity in the state. Dependence for livelihood on some form of farm activity makes majority of the population critically vulnerable to climate change. Water shortage, a major problem caused by poor and inconsistent rainfall, results in crop failure and deters livestock rearing. To make matters worse, the sandy, loamy soil with poor water retention, adversely affects cash crop cultivation, causing distress sale of cattle and farmers' migration to other regions.

PROJECT: Resilient Agricultural Households through Adaptation to Climate Change: aims to improve farmers' livelihoods by developing and implementing climate forecast- and agro-advisories, building capacities of stakeholders to implement adaptive strategies, and promoting climate suitable crop portfolio like groundnut and sorghum.

OUTCOMES: Project-level indicator of percentage of land under micro irrigation. When scaled up will meet the macro-level objective of increasing agricultural productivity and income. This will lead to the national-level reduction in migration

CASE STUDY: PUNJAB

BACKGROUND: The mainstay of rural Punjab is agriculture. Animal husbandry and dairy account for 8.36% of the state's GDP. Shortage of water, fodder and degraded pastureland will be detrimental to livestock survival. Moreover, heat stress will increase cattle mortality and disease. Together, these will reduce milk production substantially.

PROJECT: Towards Climate Resilient Livestock Production System in Punjab. In Ludhiana, Bhatinda and Tarn Taran districts. The project encourages sustainable livestock production through scientific methods like assisted insemination and oestrus management. The project will also prepare climate-friendly housing and cowsheds. An important element will be timely detection and control of animal and zoonotic diseases. It is targeted to 3000 small and marginal farmers having 5-15 animals and 1-2 hectare of land.

OUTCOMES: Maintaining sustainable livestock production. Project indicator: Percentage increase in milk production, which will contribute to macro indicator of stability or increase in income. This will contribute to national objective of doubling farmers income.

BUILD RESILIENCE