



Research Priority Setting, Monitoring and Evaluation under NATP

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April, 2000

The National Agricultural Technology Project (NATP) document emphasises priority setting, monitoring and evaluation (PME) as an important tool for improving resource allocation, relevance and accountability in the national agricultural research system (NARS). To achieve this, capacity for PME should be developed at all levels in the system for timely flow of information. Keeping these basic objectives in view, this note describes an approach for PME and its institutionalisation plan under the NATP.

I. Research Priority Setting Criteria for Research Prioritisation

Research project objectives (like increased yield, higher resistance to yield reducers, more efficient use of inputs and natural resources, new cropping system, etc.) contribute to overall and broad research goals like efficient production, sustainable resource use, poverty alleviation, export promotion, etc. Research objectives are assessed mainly on technical and scientific grounds. Research priority setting links such judgements with overall national goals using more information and analysis.

Key element in research prioritisation is the identification of criteria and their measurable indicators, which can be used to prioritise research programmes. Given the national policy goals, the criteria of efficiency, sustainability, poverty and gender impacts (Box 1) may be used for research prioritisation. Some of these criteria are easy to quantify while others may require qualitative

assessment. Also, the relative importance of these criteria may vary with the level of research prioritisation and ecosystem focus. Such assessments require interaction between agro-biological and social scientists. The latter have the tools to integrate these information in prioritisation.

(a) Macro-level Priority Setting

Macro or national-level priority setting deals with research resource allocation across regions (states, agro-ecosystems) and production systems or commodities. Given the resource allocation process in the Indian Council of Agricultural Research (ICAR), it is necessary to include these three dimensions of priority setting in the national exercise. First three criteria (Box 1) should be used for research prioritisation, as the national research system is expected to contribute to these goals. Each of the criteria will give different priority pattern, and therefore, some weights are used to compute a composite score for prioritisation. Research has a comparative advantage in increasing production efficiency and promoting sustainability and therefore, these two criteria should be given higher weights. A lower weight can be assigned to poverty, which can more effectively be addressed by other policy instruments. A weighting scheme of efficiency (0.4), sustainability (0.4), and poverty (0.2) appears to be appropriate. Gender impact is rather difficult to capture at the aggregate level and this can be considered at micro-level.

Box 1. Criteria for agricultural research prioritisation

Criteria	Measurable indicators
1. Impact on efficiency	(i) Reduction in unit cost of output (ii) Internal rate of return or economic surplus
2. Impact on poverty	Percentage of total benefits accruing to farm families below one ha, landless labourers and poor people located in the target domain.
3. Impact on sustainability	(i) Favourable to ecosystem (ii) Favourable to life system (iii) Adds to system resilience Examples: Reducing soil erosion (area covered), enriching soil nutrients (kg of NPK), improving soil texture (area covered), reducing use of pesticides (g/ha), conservation of irrigation water (ha meter), recovering problem lands (area covered), quality of life, nutritional security, etc.
4. Gender impact	(i) improving nutrition, health and welfare of farm women and children (ii) increasing income of farm women (iii) employment for women, and (iv) decreasing drudgery in farm operations.

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Methodology: Given the size of public investment in agricultural research and diversity of production systems, small adjustment in research resource allocations would amount to substantial reallocation of resources in absolute terms. Therefore, it would be desirable if a rigorous analytical approach like economic surplus model with technology spillover effects is used. Macro-level priority-setting exercise can be done once in five years by a multidisciplinary team including economists. Information is needed on the following key parameters:

- The expected impacts in terms of indicators given in column 2 of Box 1,
- probability of success of research,
- number and value of units (ha, tonnes or animals) for which the research can potentially be applied,
- price elasticity of supply and demand,
- expected adoption path,
- cost of the research, and
- possibility of technology spillover.

Part of the data on above parameters will be compiled under the activity of digitisation of database, while the rest (on technical parameters) can be elicited from the peers and revalidated using historical evidence of research impacts. Since information and analytical skill requirements are high, macro-level priority setting should be undertaken by a specially constituted unit/cell of trained scientists.

(b) Micro-level Priority Setting

Micro-level priority setting deals with resource allocation across research programmes and projects within a production system, commodity, agro-ecological zone (AEZ) or individual research institute. This exercise can be undertaken by a multidisciplinary team through a close interaction with stakeholders like farmers, extension workers, private sector, etc. This team should have active participation of the Institute Village Linkage Programme and Agricultural Technology Management Agency in identification of researchable problems.

Methodology: First step in the micro-level priority setting is the characterisation of production systems within an agro-ecosystem. Some of the information needed for this purpose will be compiled under the digitisation activity. The characterisation should be followed by identification of production constraints, growth opportunities, yield and post-harvest losses, problems related to conservation of natural resources, etc. for each production system through farm surveys and participatory rural appraisals. The work on Strategic Research and Extension Plan (SREP) of districts proposes to collect most of the data related to farmers' problems, and therefore, the priority setting team should work closely with the SREP teams. Finally, priority setting team can identify researchable problems and prioritise them using the above-suggested criteria (Box 1). If appropriate, some additional criteria such as crop

diversification, food and nutrition security, gender, etc. may be used. A simple scoring model may be useful for this purpose. This model can easily be understood and applied by scientists. In this model, impact on efficiency should be quantified using simple measures like benefit-cost ratio and the rest of the criteria may be judged on a one to ten scale. For computing the overall score, a weighting scheme can be designed depending upon the situation.

Proposal Screening

At project level emphasis should be on the consistency of research proposals with the agreed priorities and quality of research proposals. Therefore, individual research proposals should be evaluated against scientific merit of the proposal, comparative advantage of the institution and principal investigator in undertaking the research, and cost effectiveness of the proposal. A simple checklist may be used for this purpose.

II. Research Monitoring

The development of project information and management system (PIMS) and linking it with the internet will cater to the information needs for monitoring and evaluation. This system can be structured to meet organisational requirements of NATP. The PIMS is designed to capture the details of four components, namely project proposal details, project processing and sanction monitoring of progress and generating various reports. The package will be developed as on-line application at 20 units (Project Implementation Unit (PIU), Agro-ecosystem Directors (AEDs), Production System Facilitators, Planning Section of ICAR, nodal institutes for PME). Monitoring indicators and mechanisms at different levels are shown in Box 2.

III. Evaluation and Impact Assessment

Concurrent evaluation in physical and financial terms is enabled by the PIMS. Evaluation in terms of quality is to be attempted by Scientific Advisory Panels (SAPs), Research Programme Committee (RPC) and external reviews. There are two important tasks relating to research impact assessment: (i) to develop adequate in-house analytical capacity for research impact assessment work in the system, and (ii) to assess the impact of NATP after its completion. Under this, a benchmark survey will be conducted. The survey will collect information on variables relating to key concerns of NATP — multidisciplinary research in system perspective, allocation of resources in lines with agreed priorities, improvement in PME processes, participation of stakeholders, manpower development, site-specific technology generation and dissemination, research-extension linkages, etc. This information will be collected from sample institutions, which are intensively participating in NATP programmes. A similar set of information will be collected from the same institutions after completion of NATP, and impact of NATP will be assessed.

Box 2. Research monitoring indicators and mechanisms at different levels

Levels	Monitoring indicators	Doers	Information flow
PIU level	Annual progress, technical standards, utilisation of funds O&M: Change in policies, collaboration with private sector, implementation of recommendations, change in resource allocation, electronic connectivity, improvement in library system, training	Project Management Committee/ National Director/National Coordinator/World Bank/RPC/ PME-Task Force	
MM, TOE and CGP	Achievement of milestones, publications, technology developed and tested, collaboration with private sector, progress report	Programme and institutional reviews, working groups, RPC, Task forces, National Coordinator	
Agro-ecosystem Production system	Utilisation of funds, technology developed, workshops/seminars, training, progress reports, final project report Utilisation of funds, time schedule of projects, progress reports	SAP/AED/PPSS/ working groups/zonal coordination units/ PME Task Force PPSS/Facilitators/SAP/ institutional reviews	
Site level	Deviation in time schedule, achievements of milestones, funds utilisation, progress report	Site committee, institutional review/ PPSS/PI	

Note: All M&E activities will be coordinated by proposed PME Cells at different levels (see section IV).

PIU: Project Implementation Unit, MM: Mission mode, TOE: Teams of excellence, CGP: Competitive grant programme, PPSS: Principal production system scientist, PI: Principal Investigator.

It will be rather difficult to assess socio-economic impact of NATP, except in technology assessment and refinement (TAR) programmes, as usable technologies are unlikely to be developed to the adoption stage during the project life. In case some technologies are identified, their early impact in terms of farmers' response and yield gains could be assessed. To keep this exercise manageable, the impact assessment work will be undertaken in few TAR and production systems suggested by the Project Implementation Unit (PIU).

IV. Institutionalisation Plan

It will be necessary to create a functional structure at different levels to support PME activities under production system research (PSR). Mechanisms and processes must also be evolved to ensure that these are effective. Three levels are critical—national, agro-ecosystem and production system. They are inter-linked. It is proposed to create PME cells at each level and link them through a network (agricultural statisticians and economists network, ASEN in brief). The tasks at each level are indicated in Box 3.

PME Cells

- Small (3-4 scientists), economist, statistician, other.
- Drawn from one or more institutions and assigned specific responsibility for identified tasks (clear commitment from respective institutions).
- Supported by computers, internet, assistance, etc.
- Provided with budgetary support for activities.
- Acts as node for information flow between levels through network (ASEN and other means).

Process

- All proposals/reports routed through the cell.
- Cell's comments a mandatory input for review panel.
- Concerned institutions (NCAP, IASRI, NAARM) to provide technical backstopping and training.

Beyond NATP

- These processes need to be introduced system-wide. It may be desirable to select a few volunteers (institutes, SAUs) and try it out during the current phase. This experience, assessed after 2-3 years will facilitate system-wide application.
- Monitoring processes have been tried earlier, in several institutions (SAUs, institutes) it still exists. IASRI should undertake a quick study on these. This will contribute greatly to the present effort.

Initiatives Proposed

1. Constitute PME Cell at all levels under the NATP.
2. Identify and redeploy agricultural economist and other scientists to PME Cells.
3. Provide budget, computers and other facilities to the PME Cells.
4. Identify few institutes/SAUs for pilot implementation of PME mechanism.
5. Organise training programmes for the scientists attached to the PME Cells.

Box 3. Tasks of PME cells

Level and administrative control		Terms of reference of PME cell	Responsibility			
			NCAP	IASRI	NAARM	ICAR/SAU
PME 1	PIU, ND (NATP)	<ul style="list-style-type: none"> • Delineation and characterization of agro-ecosystems • Develop economic and technical database for prioritization • Prioritization across agro-ecosystems and commodities • Tracking of current resource allocation • Monitoring and evaluation 	Technical backstopping and training for priority setting	i) Technical backstopping and training for M&E. ii) Monitoring hub for PIU	–	ICAR, Planning section to take over PMF after NATP
PME 2	AED	<ul style="list-style-type: none"> • Delineation and characterization of production systems • Develop economic and technical database for prioritization • Prioritization across production systems and commodities • Tracking of current resource allocations • Monitoring and evaluation 	Technical backstopping and training for priority setting	Technical backstopping and training for M&E	–	Regional committees of ICAR to coordinate priority setting
PME 3	Production system, AED	<ul style="list-style-type: none"> • Identification and prioritization of production constraints • Interface with SREP & ATMA • Research impact analysis 	Technical backstopping, training and coordination of impact assessment work	Technical backstopping and training for M&E	Technical backstopping and training for priority setting, interface with SREP & ATMA	Priority setting by PME 4 of institutes/ SAUs located in the production system
PME 4	Institute/ SAU, Director/ Director of Research	<ul style="list-style-type: none"> • Prioritization of institution's programmes • Tracking of current resource allocations • Interface with SREP, ATMA & TAR • Project monitoring (site) and evaluation • Research impact analysis 	Technical backstopping, training and coordination of impact assessment work	Technical backstopping and training for M&E	Technical backstopping and training for priority setting, interface with SREP & ATMA	Director/ director of research to coordinate PME work

ATMA: Agricultural Technology Management Agency, TAR: Technology Assessment and Refinement

- Note:
1. National level priority setting exercise for NATP is being done by NCAP.
 2. PME 3 may be constituted by taking scientists from PME 4.

PME notes 5

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