NATP
Task Force on Prioritization, Monitoring & Evaluation

PME notes 3

Prioritization Of Production System Research

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March, 1999

The main objective of production system research under NATP is to facilitate development of location specific technologies and also adoption of prospective technologies on the shelf or in the pipeline. This is based on the premise that a number of such options are available, they need to be "finished" by undertaking some critical on-station and on -farm trials. These then go through the 'technology assessment and refinement' (TAR) process, and finally, adoption by clients.

The underlying presumption, of course, is that when such efforts are directed to solve priority problems, pay-off to research is maximized. That is why there is so much emphasis on prioritization. Having participated in several interactions with scientists, leaders, and members of different review panels, and looked at various project proposals, we feel that there is a need to articulate a systematic framework to illustrate the basic steps. This note attempts to demonstrate such framework.

Step 1 : Delineation of production system

The NATP document indicates major production systems within each eco-system. It is expected that focus on production system would lead to a homogeneous target domain for research and adoption of technologies. The first step, therefore, is to delineate each production system in geographic terms. This exercise may reveal the need to identify and delineate sub-systems to obtain better resolution. These homogeneous areas form target zones for research and TAR.

This work has to be done at the Eco-System Directorate. Some preliminary work relating to rainfed rice production system, for example, indicates that the system boundaries transcend NARP zones, state agricultural university, or even state boundaries. This exercise makes it possible to assess research capacity and gaps.

This analysis requires fairly extensive data base. Practically, it is convenient to use district-level data. It is essential that the Directorate has expertise and resources to accomplish this task in the first few months. We have lagged behind on this, but it is essential that the Scientific Advisory Panels commission this short-term analysis without losing any time. Only after this is done, can the next steps follow.

Step 2 : Constraint analysis

It is necessary to identify technical and other constraints inhibiting productivity growth in each production system or sub-system. Scientists familiar with the system have a fairly good idea about the technical constraints. This, and a systematic review of past research and development experience provides a useful starting point for constraint analysis. It is necessary to verify and quantify the extent of these constraints with the help of well-designed field surveys or RRAs. The survey teams must be multi-disciplinary and should include extension staff, NGOs, and other agencies. On-going work under Strategic Research and Extension Planning (SREP) should also be integrated.

This is followed by an analysis to prioritize the constraints. Economic calculations indicate the potential benifit which may arise if the constraint is ameliorated. Often there are other research objectives and indirect benifits (like employment generation, nutrition, sustainability impact, etc.) which need to be factored in. Such analysis allows a more objective prioritization of constraints. It provides a clear idea to researchers regarding the themes on which research attention should be concentrated.

It should be noted that under NATP-supported production system research, a focus on applied or adaptive end of the research spectrum is implied. The constraint analysis on the other hand may also identify problems for which a longer term research effort may be needed.

Step 3 : Project prioritization

Researchers submit projects addressing these constraints for funding to NATP. The Scientific Advisory Panels have the task of scrutinizing these proposals on technical merit and other guidelines (multi-disciplinarity, institutional complementarity, timeframe, etc.), and recommend those which meet the requirements. *The problem is that it is not possible to accommodate all eligible proposals within the allocated budget for the production system.* Prioritization of the projects in terms of benefit-cost and other impact indicators becomes essential. In the past, such decisions were made on the basis of subjective peer judgement; NATP requires that objective analytical approaches be used to supplement scientific judgement. This will bring about a better match between objectives and constraints and make the decision process more transparent.

As mentioned earlier, the relative benefits and costs of different research projects have to be compared. Costs

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on the benefit side that we need to focus on more carefully. Project proposals usually provide qualitative information on expected benefits in project justification section. This is not adequate for quantification. It is therefore essential that project leaders provide quantitative information on the parameters likely to be affected by the prospective technologies. This is explained further in the next section.

Given these parameters, analysts can work out benefit-cost ratios and other economic indicators which can be used to rank different projects. Training programmes for economists in different production systems are now underway in this area. Agro-Ecosystem Directors will use this capacity to provide this analysis and information to the Scientific Advisory Panel.

Project Information

As mentioned earlier, such analysis cannot be undertaken unless explicit and quantitative information are provided in the project proposals. The following paragraphs illustrate the details.

Research objectives: Project statements usually specify objectives in general terms such as, improvement in crop yield, or reducing the incidence of disease, etc. It will be necessary to quantify these; for example, increasing yield by 15 percent, reducing disease incidence by 40 percent, improve nutrient use efficiency by 10 percent, and so on. The basic idea is to quantify the objective.

Problem area and yield losses: To assess the expected benefit, it is essential to quantify the target domain. For example, if developing a wilt-resistant variety is the objective, we need an estimate of wilt affected area; similarly, if vaccine development is being attempted, the number of animals afflicted should be indicated. One also needs estimated yield loss from the identified constraint. For example, average yield loss due to wilt may be 20 percent or the disease may reduce milk yield by 30 percent. These numbers cannot be arbitrarily given. In most cases there will be earlier surveys or records which must be referred to. Ideally these should be based on the results of diagnostic surveys in each production system.

information on current and expected (after the research) yields and costs per unit (area or animal). (b) Year when research output (technology) is expected to be released, and the time required for achieving maximum adoption (see fig.) Experience indicates that 100 percent adoption is never realized. Therefore, researchers must also indicate what the maximum (ceiling) level of adoption is. (c) In addition, information is needed on probability of research success. Research is an uncertain process and a judgement must be made on what the chances of success are. This probability increases as we move towards the applied and adaptive end of the research spectrum (as in NATP production systems research), still an element of uncertainty is always there.

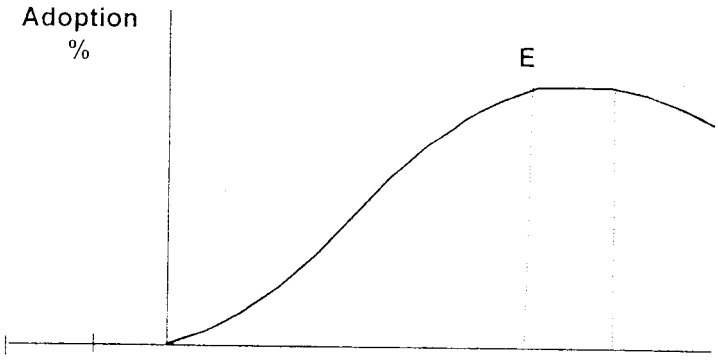

Fig : Research and adoption lags

A-B research lag; B-C assessment & refinement;
C-D adoption lag; D-E ceiling (maximum) adoption
F→ degeneration

Most of these quantitative parameters are based on judgement of scientists. Such judgements have to be backed by past experience with similar work done by the researcher himself or by others in the same area and diagnostic surveys. In any case, the peers reviewing the projects also use their experience in assessing whether the proposed parameters suggested by the researcher are realistic.

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