

Adaptive Research

by

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'Adaptive Research' studies are currently being undertaken by the extension personnel. Correct understanding and appreciation of this terminology is necessary to know exactly what needs to be accomplished in the field.

Specifically stated, it is a field testing programme of a scientific finding for immediate application before recommending for mass scale adoption.

'Field Testing', 'Field Verification trials', 'On-the-farm Testing' are some of the terms used to denote adaptive research.

Adaptive research studies have assumed added importance in the context of voluminous flow of scientific findings from different research centres within the country and outside. Consequently, the extension worker has to understand clearly whether or not a particular scientific recommendation will be suitable to his area and capable of meeting the needs and demands of the farmers and solving the local agricultural problems.

Adaptive research is the process of putting scientific findings to field test by the extension agency to assess its applicability under differing agro-climatic situations.

How is it different from 'District Trials'?

The difference is subtle. The decision on 'What to test' and for 'What situations' rests with the extension staff in adaptive research programmes.

The extension worker while recognising the agro-climatic and associated influences on crop production, makes the choice from out of the available scientific findings that are considered more appropriate and suitable for immediate use to the local situation. Thus in Field Testing, the initiative emanates from the extension worker and he is personally committed to the job. Since time factor is of prime importance in field testing studies, the duration is more frequently limited to only one season, and this weakness is compensated to a certain extent by more number of locations treated as replications.

On the other hand, in conducting District Trials, the extension worker is only an agency obliged to conform to specified designs and stipulated broad-based activities formulated and guided by the research worker. This does not allow him flexibility in operations, as this is only a part of bigger programme implemented in many more such centres. Here the job is assigned to him and

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he is one among many such field workers. The programme is not tailored to meet any specific problem and the locations are too few in numbers in an area to draw inferences on the suitability of the recommendation for different agro-climatic zones within the area.

Significance of Adaptive Research to Extension :

The more important ones are :

- A. Provides scientific basis for planning and building up realistic programmes for area and regional development.
- B. Keeps the research and other agro-based agencies continuously informed of the farmer-oriented problems, *sine qua non* for agricultural progress and development.
- C. Builds up leadership among farmers.
- D.
 1. Field oriented extension activity bringing intimate and personal relationship between the extension worker, the farmer and his associates.
 2. Affords opportunity for individual involvement in field operations and to analyse and understand the field activities exacting to the purpose.
 3. Enables the worker to acquire technical knowledge, professional competence and skill in job performance much more thoroughly than in any other assignment.
 4. Contributes to develop conviction and confidence in field application of recommended measures.
 5. Creates farmer-confidence in extension activities.
 6. Helps to develop purpose-oriented dialogue in extension programmes between the extension workers and the farming community.

Thus adaptive research is an 'extension-promotion' and 'research-farmerising' programme adding new dimension to the extension activities.

The procedure for adaptive research may be broadly outlined as follows :

A. *Problem identification and appraisal :*

This presupposes a thorough knowledge of the agro-climatic factors of the area. Generally, they include the following :

- i) Climatic factors, such as : (a) Rainfall - season, intensity, pattern of distribution, occurrence of floods, relative humidity, cloudiness. (b) Wind direction, season, velocity, incidence of storms, cyclones etc. (c) Light and temperature etc: light intensity, day and night temperature ranges during different periods, day length.

ii) Soil and associated factors such as: (a) Soil classification — black, red, loamy, alluvials, coastal marines etc. (b) Adverse soil conditions — alkali, saline and acid soils, ill drained soils etc.. (c) Fertility levels of different soils. (d) Irrigation practices like sources, method, quantum, depth and frequency for different crops, drainage problems, submergence, inundation. (e) Agricultural practices — crops and varieties grown, season, crop rotations, levels of fertiliser application — pests and diseases and control measures, and problems to step up yields. (f) other issues like: marketing, transportation, consumer preference, farm finance etc.

Precise understanding of the interaction of these factors and their impact on crop production will enable the extension worker to specify the problems confronting him in attempting to step up yield levels and farm incomes.

Discussions with different farmer categories like progressives, literates, traditionals, tenants, new entrants, and agricultural labourers would be of immense value in listing out and pin-pointing problems, general and specific to the area.

Much thought is to be bestowed to delineate agro-climatic areas into sub-zones of relatively homogeneous situations and problems specific to each of the sub-zones clearly spelled out in order of priority.

B. *Goal specification:*

Specifying goals based on problem analysis lends purposiveness and direction in searching for scientific information and designing the approach.

For eg:

- a. To identify a non-lodging, 3½-months variety, better in performance than the prevailing ADT. 27.
- b. To identify a pesticide granule effective against paddy stemborer with an eye on economic benefits.
- c. To work out manurial schedule for maize grown under splash irrigation in X area.

Specifying goal provides the basis to know what exactly is sought to be planned, organised and accomplished under the programme.

C. *Search for information:*

Sources of information are very many and varied. At the outset, it is necessary to document the published materials, reports, scientific results and recommendations of the research centres within the country and outside as relevant to the set goals. Discussing these with the local scientific workers

and their associates in the context of their findings and experiences provides the firm guideline for choice of such of those findings considered to be of immediate applicability to the area. These are sorted to serve as variables under the field testing studies.

D. *Planning and Execution :*

The processes involve step by step analysis of the programme with a view how best to organize men, materials and resources to serve the best interests of the set goals and come out with authentic findings. This comprises of an organization to :

- a) Plan and formulate the programme,
- b) Guide, supervise and provide needed technical guidance; and
- c) Mobilise resources.

Though these are interrelated activities, they have been sorted out for convenience.

a) *Planning and Formulation :*

The process involves decisions on: Spelling out the scientific findings considered for the studies ;—season for the conduct ;—Number of representative centres and their characteristics ; over ambitious target mars the quality of the programme ;— design for the lay-out and area under each of the chosen variables i.e. scientific findings considered for field testing ;— Outline specifically how best to apply the selected scientific findings and to ensure uniformity of opportunity for each of these variables to express themselves fully under the new environment ; — detailing the agricultural practices like sowing, planting, fertiliser dose, plant protection, spacing, population, irrigation, intercultivation and management practices ;— assigning manageable number of trials to the field functionaries and specifying job responsibilities ;—prescribing records and registers for making note of more important features during different growth phases of crop from sowing to harvest, on establishment, vigour, pest and disease incidences, tillering, time of heading, ripening, lodging, grain characteristics and other economic and desirable traits unique to the crop under study ; — establishing opportunity for communicating information vertically and horizontally among the charge personnel during the programme-execution and thereafter ; — maintaining co-ordination among the supervisory personnel i.e. regional officers and research workers and the top executive i.e. District or Regional Officers or the Project Officers to make prompt decisions on problems if any met with at different stages.

(b) *Guidance and Supervision :*

In an endeavour of this nature, guidance and supervision must be to improve the technical knowledge, professional competence and diagnostic

skills of the field functionaries with a view to ultimately contribute to the programme-quality and programme-improvement. More frequent supervisions and on the spot guidance in the early stages of the programme, from field selection and thereafter, provides a sound footing for a quality study. This implies thorough knowledge about the programme goals and proficiency in management on the part of the executives at the different levels like the District and Regional Officer and Subject Matter Specialists. This will involve the following: organizing and conducting programme-oriented training to the charge personnel on:

(i) significance and implications of the attempt. (ii) improving the technical knowledge and operative skills of the field functionaries in selection of the field, plot layout and conduct of the Field testing including critical observations of crop and objective assessment of the performance in economic terms. (iii) Formulating realistic date-wise schedule of field operations for the area in accordance with crop seasons. (iv) Infusing the spirit of professional integrity and scientific honesty among the field workers in reporting. (v) identifying and forecasting emerging problems in large scale extension of the suggested scientific recommendation.

(c) *Resource mobilisation:*

This will include men, material inputs, finance and other supporting facilities.

The organisation must formulate plan and deploy adequate field functionaries to perform the programmed job.

Material inputs that may be specially needed for organising the Field testing are to be gathered from available sources in adequate quantities, in time and moved to the centres with clear indications.

Finance may be needed for procuring material inputs, if any, specially needed for the programme as well to meet the additional cost likely to be incurred by the participant farmer in undertaking this job. Funds, may also be necessary for printing of records and registers in sufficient numbers. Supporting facilities will include activities extended to the farmer in getting their requirements like recommended varieties of seeds, fertilisers and such other inputs found necessary for the successful conduct. Similarly physical facilities may be needed for the field functionaries in transporting plant protection equipments and agricultural machineries etc., for timely operations.

E. *Evaluation:*

Farmers, agricultural labourers, field functionaries supervisory personnel and research workers are associated with this study. Besides, neighbouring farmers and local farming community will be evincing interest in the outcome of the Field test. Hence evaluation is both 'observational' and 'objective'.

Statistical scrutiny and analysis of the data and information on Field testing by a body of research workers and statisticians lend authoritative support to the results of the findings and their suitability. Informal discussion with the participant farmer and associates during field visits provide a fund of information on crop growth and performance, and their impressions about suitability of the scientific recommendation for large scale extension. Group seminars of participant farmers, progressives and field workers are of immense value in providing a firm guide line for future programme set up.

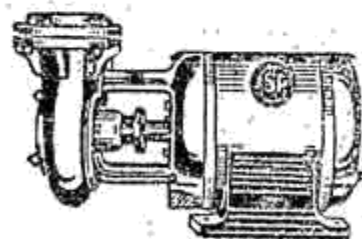
Summary: Farm testing of a scientific finding to verify its suitability to the area for immediate applicability prior to large scale extension is termed as 'adaptive research'. It is an effective method and a scientific tool to the extension agency to aid its master plan of action. Adaptive research programmes demand precise knowledge of the inter relationship and interaction of the agro-climatic and associated factors.

Problem - identification, goal - specification, formulation and execution of a realistic plan of action in the context of the available research findings and objective evaluation are essential features of adaptive research programme.



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