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**Strengthening Agricultural Extension
Research and Education - The Way
Forward**



NATIONAL ACADEMY OF AGRICULTURAL SCIENCES, NEW DELHI

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Strengthening Agricultural Extension Research and Education - The Way Forward



NATIONAL ACADEMY OF AGRICULTURAL SCIENCES, NEW DELHI

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Preface

In the current scenario of changing agri-rural environment the role of extension education and technology delivery system is also changing. Broad based extension approaches are the need of the day. A paradigm shift from single discipline orientation to multi-disciplinary approach involving multi-faceted, across thematic sectors is critical for research in the discipline. In this process, the role of institutional innovations would be critical in the context of changing agricultural scenario to reap the benefits of emerging opportunities. Due importance should be given to the discipline of Extension Education and intermittent changes in the curriculum need to be incorporated to enhance its applicability in National Agricultural Research and Education System (NARES).

The basic research in extension education is perhaps the most neglected at present. The research studies are being conducted in the field of diffusion and adoption, communication and *ex-post facto* impact assessment. Very few studies are undertaken, these days, on issues like extension methods and techniques, research methodologies and psychometric analysis and little emphasis is given on applied research as a feedback to research system. Management and other behavioural principles are taught in the postgraduate curricula but research in this area is lacking. There is a need to reorient the curricula of extension education at post graduate level and carry out research studies that may enrich the discipline and maintain its exclusivity in years ahead.

Taking cognizance of these important issues, the NAAS organized a Brainstorming Session on “*Strengthening Agricultural Extension Research and Education*” to formulate strategy for improving/refining our research approach to extension education to make the technology delivery systems, in the country, more science based and effective.

On behalf of the Academy, I express my grateful thanks to Dr A. K. Singh, Dr K Ramasamy, Conveners and Dr P. Adhiguru, Co-convenor for organizing this Brainstorming Session. The valuable inputs of all the experts, to name a few, Dr C. Prasad, Dr R. Parshad, Dr B.S. Hansra who participated in brainstorming session are gratefully acknowledged. The Academy thanks the reviewers of the document and valuable editorial support of Dr K.K. Vass and Prof V.K. Gupta.



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President, NAAS

Strengthening Agricultural Extension Research and Education - The Way Forward

With the changing agricultural scenario in India, agricultural extension education has to support the dynamic information needs of the society. Agricultural extension research is perceived as “soft”, as it often lacks clearly defined objectives and / or hypothesis(es), rigorous tools of data collection, analysis and is not programmatic [Buriak and Shinn (1989), Warmbrod (1993)]. Unless there is clarity and accountability of scientifically accepted methodology, it is difficult to assign the degree of rigor to agricultural extension work, which is an essential requirement in an era dominated by the view that scientific knowledge is utterly objective and is the only type of evidence that is valid and certain [Crotty (1998)]. According to Sivakumar (2015) “rigorous approach” for advancement of Extension Education is required. This has been stressed by many other workers; accordingly there is an ample scope to enrich course curriculum and research programmes to inculcate science based, appropriate innovative methodologies and analytical procedures in extension education. All these issues have been critically examined in the present Brainstorming exercise.

Current Status of Agricultural Extension Research

The agricultural extension research undertaken by the ICAR Institutes and Agricultural Universities is mainly *ex-post facto* research studies. However, with the need to observe and study a range of socio- psychological, economic and environmental issues, there is a wide scope to conduct *ex-ante* research (e.g., appraisal of likely outcome to a new model of extension), action research, process research, and policy analysis. Macro level studies relating to a region, country and comparative studies to understand the global scenario may offer better perspectives to design extension policies. On the contrary, currently most of research in extension education is conducted by post-graduate students at micro level using small sample size, limited funding, and limitations of students’ research because of time available and thus, obviously lack generalization and extrapolation. Such research outcomes due to lack of reliability are less utilized for policy formulation and developing action programs.

Further, there are a few in-house research projects, with no or low fund allocation, which makes the situation of getting quality research outputs worse. The outcomes of extension research benefits diverse users including field extension personnel working in public and private sectors, agro-entrepreneurs, producers of high value products for exports, agri-input and marketing agencies, academicians, and students, besides helping policymakers

to decide on critical policy issues. However, the current extension education research is often confined to academic journals and professional groups without benefiting its intended users [Prasad (2014)].

In the absence of well-structured research programs in ICAR Institutes, agricultural extension scientists are engaged in transfer of technology services to farmers / stakeholders and its documentation than research in extension education *per se*. The extension education scientists in Agricultural Universities are predominantly engaged in teaching and training activities, as a result contributing less number and low quality research papers. Both researchers and students degree research are confined to a few domains like diffusion and adoption of new agricultural technologies, comparison of extension methods, information seeking behaviour, training needs of stakeholders with major focus on field crops, and relatively low focus on animal sciences, fisheries, etc.

Diffusion research has played the central role in developing various extension theory and practices. Many conclusions drawn from this research and their application to extension practice have been misleading and the results disappointing. Extension practices still continue to make heavy use of the former conclusions of diffusion theory—“the old tenets continue to be the basic fodder for extension trainees’, even though their originator changed his views [Rogers (1962)].

Strengthening Extension Research and Education

The Post Graduate degree in Agricultural Extension needs to be oriented with relevance to specific sectors like Agriculture, Horticulture, Animal Science and Fisheries. Agricultural Education has been an un-noticed area in terms of its importance for human resource development [Prasad and Lal (2016)]. Agricultural Extension discipline is at present grouped under ‘Social Sciences’ as per the categorization under ARS by the ASRB / ICAR, though Extension Education Scientists are basically graduates in Agriculture / Horticulture / Animal sciences / Fisheries and are engaged in technology assessment and application. This issue needs appropriate consideration by the ICAR.

The M.Sc. and Ph.D. curriculum needs to include special courses in biological sciences and natural resource management depending on a student’s specialisation, area of operation, doctoral research topic and job needs. This approach will make extension education discipline more robust and competent to interface with social-ecological / biological sciences. The role of agricultural extension scientist is of having professional knowledge of the subject, methods and approaches for communication and skills in planning and evaluation of impacts. Therefore, the subject matter in the course curriculum needs to address these emerging issues.

The academic programmes leading to agricultural extension education degrees must provide opportunities to students to have more practical exposure to the theoretical concepts, which is possible when they are made to spend more time with farming communities in their field. It has been observed that the students are lacking in practical orientations due to limited time they spend with farming communities. The education which is required has to be problem solving type than merely mugging up some theoretical concepts and securing good grades.

In order to strengthen research methodologies for Post-Graduate students and faculties, Heads of Departments / Divisions of Extension Education in the ICAR Institutes and Agricultural Universities may develop a set of priority research areas in extension education and the students may be guided to take up research in those areas. Some of the issues are (i) A plethora of global research on advances in research methodologies and approaches (qualitative, quantitative and Q²- combination of both), which have emerged recently should be included in teaching and research; (ii) Upgrade the skills of extension education professionals to take up consultancies globally in areas like Climate change and impact on society, Energy crisis, Food security and Food policy, Millennium sustainable development goals; (iii) Supportive policy around funding, professional and institutional development through appropriate changes in course curriculum, along with developing high quality teachers and researchers; and (iv) Encouraging multi-disciplinary research, testing new hypotheses, development of innovative approaches to deliver knowledge with extended reach, etc.

Though the field of extension has moved globally beyond technology transfer, extension education research in India is still stuck in information / technology need assessments of farmers and constraint analysis. As extension education discipline has drawn its contents from various other related disciplines like rural sociology, social / educational psychology, public administration, human communication, journalism, educational technology and applied disciplines of agriculture, scope and space for interdisciplinary research is very high. There is an urgent need for a strong research in extension education to generate acceptable evidence of contribution of extension education research to agricultural development (Gowda *et al.*, 2014), as well as to the body of knowledge of the discipline.

With the growing presence of pluralistic extension system like public, private, corporate and farmers' organizations with varied approaches, a robust research framework and methodology need to be developed and put into practice for precise observation and quantification of impact of planned interventions.

Research methodologies and research output have high probability of acceptance if it meets three purposes, namely advance understanding of the processes of a system,

the knowledge and information generated help in identifying or diagnosing the probable causes and in prescribing remedies, and control outcomes [Ahuja (2016)]. The state of research has to be relooked into extension education in relation to above three purposes and evaluate to what extent research in extension education meets those purposes.

The pursuance of research in extension education has led to exploration of various research domains, which mainly included diffusion and adoption of innovations, communication and media, management and organizational development, documentation and validation of indigenous technical knowledge, training needs assessment, entrepreneurship development, programme evaluation and impact assessment. However, it needs further strengthening to address emerging changes in agriculture and the societal needs.

Research competencies of extension professionals is an important area, which should be regularly strengthened by exposing to research methodology developments in various parts of the world. Farmer-led Extension, Market-led extension, Institutional innovations, knowledge-led technology uptake, ICT-mediation, climate smart extension, empowering women and youth, nutrition extension, coordination and convergence have become priority research areas. Proactive policies are urgently called for by providing more and more international exposures to extension education professionals, allocating more budget for research in extension education. The National Agricultural Research System (NARS) may come up with sensitizing programs along with conducive environment for high level research and education in the discipline of agricultural extension.

Though marketing has a prominent role to increase the income of farmers, very few researchers have addressed this area. Agricultural extension needs to accumulate experiences and approaches from other disciplines and enrich the course curriculum adequately by drawing from disciplines like agri-rural management, gender development, development administration, etc. Acquiring need based knowledge in these areas will also enhance the scope and output of extension education research. Thus, there is a need for paradigm shift in extension education research from predominant areas of diffusion, adoption and communication to multi-faceted, cross thematic and sectoral areas. Such researches also need to cover extension methods and techniques, innovative research methodologies, frameworks, interface, socio-economic and psychometric analysis and quasi experimental designs. The agricultural extension research ought to focus on the emerging needs of 21st century in context to globalization, technological development, changing demography, climate change, sustainability issues including management of natural resources.

The full series of research so far almost unexplored in the field of agricultural extension includes Sustainable Livelihoods and Project Design, Developing Methodologies for Livelihood Impact Assessment, under different socio-economic environment. The other

areas including watersheds and their Impact on Rural Livelihoods, Methodology for Adopting a Sustainable Livelihoods Approach in Agriculture, and finally Applying Livelihood Approaches to Natural Resource Management.

Specific thrust areas of research in extension education

After detailed deliberations in the BSS following areas were identified for funding support:

- Mapping of socio-economic and socio-personal patterns in different agro-ecosystems.
- Climate change adaptation: Typology, frameworks, policy and practice dimensions.
- Process on co-production of adaptive knowledge and co-management with multi-stakeholders.
- Citizen science, agricultural sustainability and agricultural policies: Livelihood implications (with regional and national priority).
- Trans - disciplinary research in agricultural sector for plural knowledge.
- Institutional innovations, extension reforms, dynamics of convergence and linkages in extension.
- Skill gap analysis and capacity development of stakeholders.
- ICT-led knowledge management, usage patterns and impact.
- Nutrition extension: Awareness, dietary pattern, designing suitable interventions for nutri-smart villages.
- Value chain analysis, market-led extension and agri-business models.
- Gender partnership in agriculture and gender sensitization.
- Technology and resource mapping for optimized use and suitable extension interventions.
- New approaches and process of extension interventions, and social learning for climate smart agriculture.
- Adoption and impact assessment of NARS technologies.

Recommendations for Strengthening Extension Research and Education

There are several significant research findings which contributed to the existing body of knowledge. It is hoped that the implementation of the recommendations of this Brainstorming Session would lead to produce more able, independent, client-oriented extension professionals and practitioners. The specific recommendations pertaining to research methodology, relevant researchable and general issues are as under:

a) Methodology

- i) Appropriate sampling procedures, including sample size, analytical methodology may be followed so as to ensure acceptance of the research results by the scientific fraternity, and NAAS Rated Journals.
- ii) More research is needed on standardization of data collection including tools, process, and selection of items for schedule / questionnaire, development of case studies.
- iii) The statistical analysis (parametric / non-parametric) may be undertaken based on level of measurement and the reliability and validity rather than as a 'fancy' for use of higher predictive approaches.
- iv) The discrete variables may be preferably converted to 'Z' score before analysis for meeting the data normal distribution requirements.
- v) A comprehensive national training of two weeks on 'Research Methods in Extension Education' needs to be arranged with focus on Theory and Practice. The faculty members may be selected having excelled in research methodology as well as in teaching skills. This may be followed at zonal level so that a sizable number of scientists are exposed to new methodologies.
- vi) Some Divisions of Extension in ICAR institutes / Agricultural Universities may be identified to develop / conduct refresher courses for capacity building in research methodology.

b) Enhancing utility of research outputs

- i) The visibility of extension research is also to be improved through interface with other stakeholders culminating meaningful contribution to develop country wide extension policy.
- ii) A Network Project may be initiated with ICAR-IARI, New Delhi as the nodal Centre focusing on technology (Crops / Horticulture / Animal Science / Fisheries) mapping in different agro-ecosystems.
- iii) At present, there are a few journals related to extension education discipline having NAAS rating. Therefore, intensive efforts need to be made to include more journals. Further, the NAAS may develop a separate procedure for rating research journals of Extension Education discipline.
- iv) Because of low score in publications, the scientists from Extension Education discipline often are at disadvantage while applying for posts open to all disciplines advertised by the Agricultural Scientist Recruitment Board (ASRB). The NAAS may develop a method of percentile score of highest scored journal and identify journals related to extension education.

- v) For enhancing utilization of research results, Extension Education Research need to be coupled with policy advocacy programs, stakeholders' interfaces, publication of policy documents/reports for wider knowledge sharing.
- vi) Experience of Research in Extension Education may be given preference by the ASRB for selection of RMP including Joint Directors of National Institutes / Director ATARIs.
- vii) The indicators of professionalism need to be developed and shared with stakeholders to demonstrate enhanced professionalism while conducting research / teaching / field extension.
- viii) Decrease in share of total investment in extension (from 35.05 % in 1961-1970 to 18.57 % in 2001-2010) is a matter of serious concern and therefore, it needs to be addressed by convincing the planners and policy makers for greater financial allocation for research in extension education.
- ix) Agricultural Technology Application Research Institutes (ATARI) may derive strength from extension education scientists of Agricultural Universities and ICAR institutes. Well-developed multi-disciplinary/interdisciplinary research projects may be taken up and results put to effective use. Transfer of Technology models for different agro-climatic and socio-cultural endowments need to be developed, validated and out-scaled.
- x) A National Research Institute in Extension Education may be established with regional centers to carryout Coordinated Research in Extension Education.
- xi) Participatory research projects involving different disciplines may be taken up. The scientists in disciplines like Agronomy, Plant Protection, Soil and water management, and Food Processing may be called upon to include Extension Scientists as a part of their project team.
- xii) Field orientation of extension scientists / teachers in SAUs may be ensured by involving the faculties to accompany their students in research data collection or in conducting practical classes.

c) Teaching

- i) Capacity development of extension education scientists / teachers need to be ensured after their induction in SAUs / Deemed Universities for undertaking UG and PG teaching.
- ii) In-service or refresher trainings may also be arranged at national and international institutions through Faculty Exchange Program.
- iii) Many courses in Extension discipline at M. Sc. and / or Ph.D. level have overlapping contents. A Committee may be constituted to examine merging of such courses and suggesting other relevant subject areas as well.

- iv) Students in Extension Education must take courses (4-6 credits) as non-credit from disciplines like Crop Production, Crop Protection, NRM, Horticulture, Post-Harvest Technology during M. Sc. / Ph.D.
- v) Extension Education students may also have internship of working with stakeholders (Farmers, NGOs, Private Organizations) during summer/winter break to have field orientation and better understanding of clientele situation and knowledge demands.
- vi) E-learning modules of specialized courses in extension education may be developed by identified centers, and the content be regularly uploaded in institute portals/ extension education portal for use by the students and faculties of SAUs / Deemed Universities.
- vii) Massive Online Open Courses (MOOC) on various topics in extension may be developed for extension.
- viii) A Handbook on Agricultural Extension, which follows the unified PG courses, may be published by Division of Agricultural Extension, ICAR on priority.
- ix) At present, Extension Education Post Graduate Degree holders (Two years) are classified as 'Social science'. It is a matter which needs consideration at the highest level for placing Extension Education Discipline as an Applied Agriculture Discipline, instead of grouping it under 'Social Sciences'.
- x) There is need to develop specialization during M.Sc. and Ph.D. in Extension Education Discipline; specific Specialization areas may be identified for which the ICAR may constitute a Committee. The scientists working in discipline oriented institutes like Veterinary / Fisheries / NRM may be duly considered by the proposed committee.

d) General

- i) There is also a need to quantify the contribution of extension education so that it is appropriately brought to the attention of policy makers and planners.
- ii) Virtual platforms like Facebook / WhatsApp / Blogs (like AESA blog) should be created to invite suggestions from the extension professionals, so that views for improvement in the discipline can be explored and needed changes are brought about in due course. The networking of extension professionals will also help in replicating success and minimizing failures.
- iii) Integrating gender and nutrition in extension should be given priority. Gender sensitization of extension professionals is needed to capture the extension need of farm women for organizing specific and specialized programmes for them.

- iv) Research must be carried out to quantify the contribution of extension in agricultural and rural development. The extension contribution is to be projected for reshaping the research agenda of NARS.

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Note: The designations and affiliations of the participants are as on the date of Brainstorming Session

