



Role of Social Scientists in National Agricultural Research System (NARS)





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Preface

Social sciences when reinforced with biological sciences will provide human face of science, because science is for society and hence science without human face is body without soul. Social sciences study the nature, measurement and analysis of needs and aspirations of people so that science can continuously remain relevant and contribute to the welfare of mankind. Specifically, social sciences help organize research and education around societal problems in scientific disciplines by improving focus, design, implementation, evaluation and demonstration of evidences of impact. It is to be noted that despite having so many scientists, scientific establishments and universities in India, our science index is low, human development index is low and our hunger index is alarmingly high. It is time that social sciences of agricultural economics, agricultural extension, agricultural statistics, food and nutrition and home sciences get due attention to play their role as ears and eyes of the National Agricultural Research and Education System (NARES). It has been largely felt that while social sciences could play a larger role currently within NARES, their role is not adequately recognized and more needs to be done to duly recognize them and strengthen the capacities of social scientists.

With the above backdrop, the Academy sponsored a Brainstorming Session (BSS) on 23rd May, 2015 with Dr. Mruthyunjaya, Former National Director, National Agricultural Innovation Project (NAIP) as convener. Over 25 leading experts in different social sciences participated in the BSS. It emerged that there is lack of clarity on the potential role of social scientists in the system besides critical mass. There is need to fill in large chunk of vacant posts in social science disciplines in ICAR institutes and SAUs. Strengthening food and nutrition and home science research and education has increasingly become important and hence needs special attention. There is also a strong need for training, both national and international and skill up-gradation of social scientists in using advanced methodologies to gain deeper insights on the emerging complex problems and plan for their redressal. The role of professional societies, ICAR-National Institute of Agricultural Economics and Policy Research, ICAR-Indian Agricultural Statistics Research Institute, social science departments in ICAR institutes and SAUs, International Food Policy Research Institute and others in strengthening social sciences is also critical

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Dr. S. Ayyappan
President

Role of Social Scientists in National Agricultural Research System (NARS)

1. Introduction

Social sciences like economics, statistics, sociology, extension, political science provide the socio-economic sense of science by studying the nature, measurement and analysis of needs and aspirations of people so that science can remain continuously relevant and contribute to the welfare of the society. Specifically, social sciences help organize research and education around societal problems in scientific disciplines by improving focus, design, implementation, evaluation and impact demonstration. In agricultural research system, social science discipline acts as 'eyes and ears' of the system to prioritize research, facilitate adoption and quality impact to justify research funding. NAAS was feeling that while social sciences could play a larger role currently within NARS, their role is not sufficiently recognized and a lot more needs to be done to duly recognize them and strengthen the capacities of social scientists to play this larger role. While examining the role of social sciences, it is necessary to recognize that social sciences should reinforce biological sciences to provide human face of science, because science is for society and science without involving social sciences cannot provide human face. Despite having so many scientists, scientific establishments and universities, our science index is low, human development index is low, and our hunger index is alarmingly high, meaning thereby that science outputs are not commensurate with social problem. Scientific excellence and rigour is important but it should marry relevance for which social sciences should be the epicentre. Hence it is important to understand the status, present role and constraints, so that future role and how to strengthen social sciences in NARS to play pro-active, expected future role of helping enhance the growth of agricultural research and make it globally visible, acceptable and competitive, can be outlined.

The scope of social sciences has been variously defined at national and international levels, to inter alia include economics, sociology, political science, geography, philosophy, psychology and anthropology. Some organizations treat humanities separately and use the terms social sciences and humanities. For the purpose of this paper, the scope as defined by NAAS is used. Accordingly, the disciplines included for review are agricultural economics, agricultural extension, agricultural statistics, human nutrition and home science. The statuses (strength, contributions, constraints) of these disciplines in NARS, the present role of scientists, and the expected future role of scientists and the needed support to play the expected roles in these disciplines are presented in the sequel.

2. Agricultural Economics

Research and teaching in agricultural economics in NARS is pursued in the specializations of farm management and production economics, agricultural finance, agricultural marketing and trade, agricultural development and policy and of late in agribusiness management. Routine analysis around these specializations involves cost-benefit analysis, estimating financial ratios, working out marketing margin, trade surplus and deficits, inventory, investment and evaluation of government programs.

The role and contribution of agricultural economists can be traced to the phases of agricultural development in India and began with the inception of State agricultural Universities in early 1960s. Some bench marks follow:

- (i) In 1960s, in the course contents at under-graduate (B.Sc. Ag) level, farm management decision principles were introduced, which was critical to accelerate the transfer of new technologies to the farmers. As a result, agricultural graduates, who were at that time mainly employed in public sector agricultural extension system, could do the assigned task more effectively. That was the critical requirement of the time.
- (ii) A group of agricultural economists helped the Government of India to conceptualise, operationalise and implement the whole gamut of agricultural price policy, which has been an important pillar of strategic foundation of agricultural development and food security launched in late 1960's.
- (iii) It was also around this time, when SAUs were being set up, post graduate program in agricultural economics commenced in NARS. New courses at PG level were introduced to equip students in the areas of production economics, agricultural marketing, agricultural finance/credit, agricultural price analysis and applied econometrics. Many of the post-graduates in agricultural economics were selected and occupied middle level managerial positions in banks, and marketing institutions, initially in public sector and later in private and cooperative organizations. It needs to be mentioned that some of these PG courses were favourite minor courses for the students majoring in agro-biological disciplines.
- (iv) In 1960s and 1970s, the agricultural economists helped the Government in conceiving and operationalising the first phase of agricultural marketing reforms in the country. This includes formulation of first Model Act (Agricultural Produce Markets Regulation Act), circulation to state governments and sensitizing states to adopt, which helped create conducive marketing environment ((both physical and institutional) for the farmers in rural/primary markets. Later, during 1980s and 1990s, agricultural economists continuously evaluated and revisited the first phase of agricultural marketing reforms and helped Government to come

out with the second phase of reforms in late 1990s and early 2000s, which are currently ongoing.

- (v) Agricultural economists in NARS provided continuous support to agro-biological scientists to evaluate their new technologies on sound farm management principles. As a result, many of the agro-biological scientists are able to carry out cost-benefit analysis of their technologies on their own.
- (vi) Initially, Agricultural Economics Division of IARI and some SAUs like PAU, Ludhiana, GBPUAT, Pantnagar, TNAU, Coimbatore and UAS, Bengaluru were relatively strong but later other SAUs also picked up.
- (vii) In late 1960s and 1970s, agricultural economists strongly contributed to the analysis-based significance of finance and institutional credit for the farmers, culminating in nationalization of commercial banks and introduction of the concept of priority sector lending which benefitted small and marginal farmers in accessing credit from financial institutions.
- (viii) In early 1980s, when macro food security was in sight, agricultural economists demonstrated the need for shift from national food security to household and individual food security. Several programs and schemes currently in operation are the off-shoots of the beginning made in 1980s.
- (ix) Research outputs of agricultural economists (from SAUs, ICAR Institutes, Agro-Economic Research Centres (AERCs) and other institutes with strong agricultural economics component) are continuously used by Commission for Agricultural Costs and Prices (CACP), Planning Commission (now NITI Ayog) and other decision making bodies of central and state governments.
- (x) The ICAR also recognised the contribution of agricultural economics discipline and established the National Centre for Agricultural Economics and Policy Research (NCAP), which has now been upgraded to the National Institute.
- (xi) Agricultural economics research with in NARS got a real boost after the establishment of NCAP. Not only the level of analysis reached new heights but the scope of research also expanded. Some areas of high-level significance which received attention are returns to investment in agricultural research, prioritization of research resource allocation, analysis of total factor productivity, PME methodologies, forecasting of prices of farm products, demand-supply projections and research-cum-analysis based feedback and inputs to the policy makers on concurrent issues.
- (xii) During the last 10 years, agricultural economists have been actively involved in formulation of Five Year Plans both at the centre and state levels.

However, it is being felt that the role and contribution of agricultural economists is not fully understood and recognized at all levels in the NARS. Most of the heads of Institutions (Directors and Vice Chancellors) and other senior managers are not fully aware of the role that agricultural economists can play in the system. This is reflected in the routine duties quite often assigned to agricultural economists in many institutes/SAUs.

The other constraints facing the discipline include, low and falling capacity (number, quality), consistence, coherence, commitment, productivity, linkage both upstream with advanced research institutions and downstream with development departments, NGOs, CSOs, FOs, farmers, etc.; research around the discipline than specific problems; publications not analytical enough; research and teaching mostly centred around production economics; methodological weakness and mechanical application of empirical methods; not following recommended PG research and best education practices; massive body of available information not used/used less creatively; less use of technical knowledge in agriculture in economic analysis; excessive inbreeding in recruitment; non-availability of teaching materials; many vacant positions, abolition of the post of ADG (ESM) at ICAR (HQ); lack of critical mass of qualified/competent agricultural economists in many institutions/centres; external evaluation missing; inadequate funding support; lack of computational and transport facilities; many new areas of research and teaching emerging fast outside India; Indian Journals publishing mostly articles in production economics, agricultural development and policy and marketing and trade in that order whereas international Journals publishing articles in environmental economics, agricultural marketing and agricultural policy in that order; only 7% of articles published in Indian Journals use advanced methodologies where as 42% of articles in international journals use advanced methodologies, etc.

The future role may include prioritizing agricultural research for enhancing the development value of agricultural technologies and impact assessment; development of supportive policy choices in and their impacts relating to food and nutritional security, reduce poverty, transform low income agriculture to high income sustainable agriculture at rapid rate, continuing shortage of oilseeds and pulses, rationalization of subsidies to encourage sustainable resource use, adapting and mitigating the adverse impact of climate change, evolve institutional arrangements for implementing eco-system services, analysis of sustainable livelihood approaches, land market reforms, linking farmers to markets and value chains, dietary changes and enterprise diversification, institutional innovations for scaling up and scaling out of technologies and good agricultural practices, PPP models for convergence and synergy among public sector, private sector, NGOs, CSOs, FOs, etc., Women and youth engagement in development, etc.

To play the new roles along with some of the needed conventional roles, the discipline has to be strengthened with respect to, (i) filling up of all vacant positions; (ii) restoring

the position of ADG (ESM) in ICAR; (iii) minimize inbreeding through suitable recruitment and transfer policy; (iv) posting on regional basis or at head quarter of the institution to ensure critical mass of staff; (v) adequate funding and transport and computational facilities; (vi) encourage research and teaching in new areas, development of teaching materials, application of advanced methods of analysis; (vii) strengthen PG research and teaching using 4th Dean Committee recommendations; (viii) strengthen periodic training of staff nationally and internationally, encourage competitive funding of research projects, consultancy and resource mobilization; (ix) incentivize quality publications in high impact journals; (x) strengthen professional societies to take proactive steps to promote professional excellence in their activities like prioritizing research areas and facilitating preparation of competence, organizing special sessions during annual conferences on recent advances in methodologies; (xi) to encourage upstream and downstream linkage and partnership, NCAP (now NIAP) to build networks and main stream agricultural economics research in all projects, etc.

3. Agricultural Extension

Role of agricultural extension discipline in technology perfection and transfer during the first green revolution period and current phase of second green revolution hardly needs any emphasis. The network of KVKs in NARS has been characterised as an institutional innovation for agricultural development. Their role in perfection and diffusion of new technologies through FLDs is well-known. Agricultural extension specialists have contributed immensely in training of government extension workers, farmers, farm women and rural youth. They have demonstrated, on large scale, the power of diffusion science, through their role in implementation of component 3 of recently concluded NAIP. They have been also instrumental in providing conducive platforms to agro-biological scientists to disseminate and popularize their new technologies and also to get feedback from farmers as well as other stakeholders like seed companies, input supply agencies, processors and traders.

However, the potential of agricultural extension is yet to be fully realized in NARS. While the parent disciplines such as psychology, sociology, communication, innovation studies, etc, have evolved considerably, the discipline of extension is remaining static. Even after 65 years of existence, the role of agricultural extension in NARS is yet to be clearly articulated. Extension scientists are not clear whether they should be transferring technologies of the organisations where they belong to or engage in social science research or are they to play the role of an event manager in the organisation. Most of the research publications in extension are from PG research. Policy relevant work is missing. Many scientists are engaged in mostly organizing training programs. There is lot of weakness in academic training. M.Sc/ Ph.D training is neither producing good field professionals nor very good researchers.

Knowledge of soft skills is missing and students are losing in the job market. Due to these reasons the discipline is not attracting best talents. In some universities, the extension subjects are being taught by faculty not qualified in extension, they are also guiding M.Sc./M.V.Sc./M.F.Sc. and Ph.D. students in extension discipline. Since extension education departments are staffed by unqualified / less qualified faculty, the opportunity of recruitment of qualified extension faculty is further reduced leading to unemployment among students qualified in extension education discipline.

The professional societies in extension are not addressing any of the weaknesses in the discipline such as lack of relevant research, routine topics and methodologies followed in post-graduate research, and poor quality of journals. There is no oversight on the performance of professional societies. The future roles of Extension scientists have to be on facilitating or enabling innovation through linking the different actors in the Agricultural Innovation System (AIS). The discipline should focus on enabling innovation than focusing purely on technology transfer. Extension needs new capacities at all levels (individual, organisational and enabling environment). There is a need to have more research on ways of facilitation of innovation, understanding and promoting institutional innovations, analysing the role of technology business incubators, undertake consumer studies, examine issues of gender and social equity and application of modern information and communication technologies.

To play these new roles, there is a need to organise curricula review, initiate programmes to train teachers to teach new curricula and undertake a thorough assessment of the strengths, weaknesses and needs of the discipline in consultation with relevant stakeholders, especially those who are recruiting the extension professionals/researchers. A close collaboration with the Global Forum for Rural Advisory Services (GFRAS), which is engaged in strengthening of research and training in extension would be relevant here. The proposed AICRP in extension by ICAR might be a good opportunity to strengthen research. We should also take full use of the capacities within the Zonal Project Directorates to co-ordinate regional research in extension. Review of professional societies in extension, and clarifying the role of extension within NARS by ICAR is also important. Finally, we must glamorize agricultural extension in content and delivery.

4. Agricultural Statistics

Research in statistics is fundamentally important and absolutely essential. Fusion of statistical sciences in agricultural sciences for quality agricultural research is also very important and highly desirable. Similarly research in other social sciences with blending of statistical sciences is also important and desirable. The major role of statistics in agricultural sciences is *Data Designing*, which essentially involves (i) Data

generation, (ii) Data Analysis, (iii) Data Interpretation (Inferences), and (iv) Deriving Knowledge. All these stages are intertwined and sound application of statistical theories is required at every stage. Thus, sound knowledge of statistical sciences ably supported by basic research in statistics is absolutely essential for the growth of agricultural research. It is no wonder then that the great vision of research managers in ICAR in 1930 enabled them to realize the importance of statistical sciences in agricultural research, which led to creation of a statistical section in the ICAR to assist the State Departments of Agriculture and Animal Husbandry in planning and designing their experiments, analysis of experimental data, interpretation of results, and also rendering advice on the formulation of the technical programs and examining the progress reports of the schemes funded by the Council. The activities increased rapidly and studies were initiated for developing objective and reliable methods, based essentially on crop cutting experiments, for producing yield and production statistics of principal food crops. The efficiency and practicability of these methods was demonstrated in different States for estimating crop yield. As a result, in the course of a few years, the method was extended practically to the entire country to cover all principal food and non-food crops. Presently, 9 lakh crop cutting experiments are conducted in India to estimate production of 48 crops.

For capacity building, at present M.Sc. and Ph.D. programs are being conducted in the discipline of Agricultural Statistics, Computer Applications and Bioinformatics.

Major research contributions have focused on (i) Design of Experiments, (ii) Sample Surveys, (iii) Statistical Genetics, (iv) Forecasting Techniques, (v) Statistical Modeling including non-linear time series modeling, (vi) Econometrics, (vii) Computer Application, and more recently (viii) Bioinformatics.

Success of agricultural research in achieving self sufficiency in food production and food security is undoubtedly commendable contribution of agricultural scientists. But the efforts of agricultural statisticians have propelled these major breakthroughs. Experimental designs helped in navigating from varietal trials to varieties and package of practices, translating varieties into enhanced crop production, by harnessing and detecting technologies and identifying conditions that optimize the response.

Agricultural statistics and bioinformatics help identify biotic and abiotic factors affecting the production. Statistical modeling of biological and economic phenomena also helped significantly agricultural research. Statistical modeling for forecasting and forewarning helped in policy planning. In this process, agricultural statisticians have not only analyzed volumes of research data but have also evolved newer statistical techniques for data analysis in view of many economic, climatic and physical resources.

The efforts of statisticians led to the development of statistical computing and online statistical data analysis portal, software packages and web resources. The prominent web resources include Design Resources Server and Sample Survey Resources Server. Other web resources created include web generation of experimental designs for different situations, web solutions for estimation of compound growth rates, several software packages for generation of experimental designs and analysis of data, analysis of survey data and animal breeding data, packages useful for analysis of agricultural research data, etc. Other important breakthroughs have been the creation of National Agricultural Bioinformatics Grid (NABG), High Performing Computing (HPC) System for Biological Computing, Advanced Supercomputing Hub for OMICS Knowledge in Agriculture (ASHOKA). These efforts coupled with ad-hoc training programs for agricultural scientists led to the synthesis of statistics in agricultural sciences. The status of experimentation has changed tremendously and the research papers of scientists in NARES are getting published in international journals with high impact factor.

Indian Agricultural Statistics Research Institute (IASRI), one of the premier Institution in agricultural statistics and informatics, is an ISO 9001:2008 certified Institute of Indian Council of Agricultural Research (ICAR). ISO 9001: 2008 is an international standard related to quality management system, applicable to any organization from all types of business sectors and activities. The certificate of ISO 9001: 2008 was issued by Equalitas Certifications Limited on 18 November 2013 and is valid till 17 November 2016.

Basic research in statistical sciences is fundamental to its innovative applications in biological / agricultural sciences. It, therefore, becomes of paramount importance to ensure that for quality basic research in statistics all stumbling blocks be cleared so as to warrant quality agricultural research, which takes us on the path of ever-green revolution; agricultural research which is globally visible, competitive and acceptable.

- The Institute was created with a goal to develop trained manpower in the country in the discipline of agricultural statistics so as to meet the challenges of agricultural research in the emerging areas and help make agricultural research globally competitive, visible and acceptable. Over time, computer applications and bioinformatics were also included in its gamete. The ultimate goal is to synthesize statistical sciences in agricultural sciences.
- In view of the continuing prosperity of agricultural research keeping in mind the future trends of agricultural research it is of overriding importance that (a) demand for statistics - the science of learning from data - and statistical

expertise explode more than ever; (b) the need to strengthen the discipline of statistics so as to meet the challenges of up-and-coming researches along with innovative non-trivial applications continues with renewed and recharged obsession, passion and energy.

- For capacity building and human resource development it is absolutely essential that the teaching / training / ad-hoc training programs are further strengthened.
- Major decisions to be taken, therefore, are (i) attract students from (a) basic sciences with strong aptitude for Mathematics; (b) attract students from B.Sc. (H) Statistics; (iii) introduce specialization of at least one year in Statistics at B.Sc. (Ag.) level; (iv) produce more students in M.Sc. / Ph.D. programs in Statistics at ICAR-IARI and SAUs; (v) M.Sc. program be made of two-years duration for students admitted from non-agricultural stream., (v) introduce Post-Doctoral Program in Statistics for retaining talent.
- Other steps to be taken in this directions for this to happen include (i) appointing more number of adequately trained faculty and statisticians with strong aptitude for mathematics in SAUs, ICAR Institutes and ICAR-IASRI; (ii) retaining trained manpower appointed through ARS examination and bring more qualified and trained statisticians into the system through lateral entry; (iii) reintroducing diploma and certificate courses to reinvigorate linkages with state departments of agriculture, animal husbandry, fisheries, horticulture, etc.
- Steps required to popularize the importance of statistics are (i) web platform for degree courses in Statistics to popularize the discipline and create trained manpower in the country; (ii) introduce webinars for popularizing Statistics and Computing; (iii) enhance the exposition to statistical sciences, statistical computing and data science during FOCARS (Foundation Course for Agricultural Research Services) at NAARM; (iv) Statisticians also need to actively collaborate with and understand the terminologies of agricultural sciences for innovative and novel applications. Besides, statisticians should work in close collaboration with experts in different SMDs.
- For attracting best talent in NARES, (i) the service conditions of scientists should be the same, if not better, as their counterparts in Central Universities; (ii) the recruitment process in ARS should be conducive to attract talent from reputed institutes like Indian Statistical Institute and many good Indian Universities; (iii) For recruitment at entry level of ARS in the discipline of Statistics, the essential qualifications should also focus on candidates with strong grounding

in Mathematics and Statistics; (iv) the discipline of Statistics needs to be separated from Computer Applications and Bioinformatics, and, therefore, there should be clearly defined separate cadre strengths for (a) Statistics and (b) Informatics in ARS.

- The main challenge facing the discipline is that it is not considered as a research discipline on account of the usual mindset that statistics is a service discipline not a research discipline, a data parking place for routine data analysis. It has to be recognized as a research partner of NARES, NASS, basic and strategic research and human resource development in the discipline.
- IASRI to become a deemed to be University so that it is possible to admit students with strong background in Mathematics along with increased intake of students.
- In view of computing needs, Strengthening Statistical Computing (SSC) in NARS needs to be extended in a network mode so as to derive full advantage from this resource. Design Resources Server (DRS) needs to be further strengthened and rigorously pursued with passion. Synthesizing DRS with SSC NARS provides a complete solution to the agricultural research.
- Web resources for statistical modeling / non-linear time series modeling for biological and economic phenomena including forecasting and forewarning need to be created.
- Publish pocket diaries highlighting success stories about innovative applications of statistical sciences in agricultural sciences like newly developed sophisticated experimental designs used by the agricultural scientists and research students and the statistical models developed and applied. Publish text books on statistical data analysis and modeling for the stakeholders in agricultural systems research.
- Enhancement of scientific computing in the agricultural research is both critical and urgent. Big Data and Computing is very challenging area of research and would demand development and integration of statistics, mathematics, computational sciences, biological sciences and other related disciplines necessary.
- The future scenario of research in Agricultural Statistics would need to encompass newly emerging areas like climate change, geo-informatics, data mining, and agricultural environmental health, particularly the epidemiology, toxicology and related issues, and high dimensional complex data sets, etc.
- In view of other up-and-coming disciplines, it is of paramount importance that Statistics should not be lost sight of because it is the food for all sciences.

4. Human Nutrition

Nutrition research is a blend of basic and applied sciences in which social aspects like communication for behavioural change, statistical and economic considerations for planning programmes are important. For health and nutrition security, there has to be Awareness, Access and Affordability to ensure balanced diet, and also conditions of absorption (safe drinking water and disease free environment) and health care outreach. The role of community workers and empowerment of women are very important. Ensuring food and nutrition is the responsibility of agriculture. It is reported that notwithstanding several development and feeding programs, India battles under-nutrition and loses more than US\$ 12 billion in GDP to Vitamin and mineral deficiencies. Top-down approach without preparing the community and ensuring its participation is one of the reasons for inadequate impact of several development programs in human nutrition. Food security (balanced diet supplying required quantity of energy, protein, vitamins and minerals), should be addressed at household and individual level rather than stopping with calorie sufficiency at the national level. Nutritional security can be achieved with a blend of scientific, technological and social engineering.

In the NARS with more than 100 ICAR institutions and 70 SAUs, human nutrition in terms of institution or dedicated program does not figure anywhere. Nutrition is referred to in passing, which is unfortunate. The view that food and nutrition is the mandate of some institutions like NIN, CFTRI, home science colleges perhaps needs immediate review in the context of emerging role of nutrition in agriculture. This becomes especially important as per the World Bank suggestions that developing countries should re-position nutrition as central to development and investment in nutrition is one of the “best buys” that developing countries can make for ensuring growth.

Several strategies are followed by Government of India for meeting calorie and protein needs (feeding programmes of ICDS and Mid Day Meal for schools) and delivering micronutrients as pharmaceutical supplementation, food fortification, micronutrient sprinkler, powders being added to cooked food, promoting dietary diversification through crop diversification, bio-fortification, (conventional breeding, marker assisted selection, genetic engineering), etc. To ensure greater impact from these programs, involvement of communities is essential.

Farming system to leverage agriculture for nutritional outcomes with emphasis on location specific planning to address nutritional needs of community is suggested. Such an approach will be possible if agricultural graduates are aware of nutrition problems, nutrients in foods, their functions and nutrient dense crops and other aspects

of human nutrition. Earlier nutrition was a subject in B.Sc. (Agri.) degree programs, but now it is deleted, except brief mention of structure of protein, carbohydrates and fats in bio-chemistry syllabus. This needs immediate attention.

There is insufficient interaction between agricultural scientists and human nutrition scientists. There are Departments of Human Nutrition in home science colleges but there is no dialogue or involvement between the nutrition fraternity and agricultural fraternity of nutrition scientists in research projects planning. There is need for periodic training of agricultural scientists and extension workers as well as other biological scientists in new developments and scientific advances in human nutrition. There is also a need for continuous monitoring of food and nutrient intake and nutrition status of the people through organization like National Nutrition Monitoring Bureau (NNMB), which is the unique data repository for all nutritional planning and development exercises in the country. The proposal to dismantle it is unfortunate, counterproductive and should be resisted and represented at the highest level.

5. Home Science

Home science aims at creating better standard of living and family ecosystem. The main focus is empowering women and girl child in rural and urban households through continuous academic, research and extension activities. The beginning of home science in colleges was made in 1932 by Lady Irwin College in Delhi. From 1938 onwards Madras University introduced home science at the degree level. Agricultural institute of Allahabad had also started a diploma course in home science in 1935 and it became a university level department in 1945. The need for teaching home science was recognized in most of the SAUs and home science colleges were opened since 1960 and 1970s. Since then Home Science education, research, and outreach programmes have reached people and benefitted them in many ways.

The major areas of home science include, apparel and textiles; foods and nutrition; resource management and community sciences; human development and family studies; and home science extension and communication management. Home scientists are involved in several academic programmes like teaching and guiding students, training human resource, entrepreneurship development, personality development, etc. The main areas of home science research include, development of technologies and their validation, changes in the attitudes of women in villages, integrated development of rural families, collaborate with government and non-government agencies in planning, implementation and evaluation of development programmes. The main outreach programmes in home science include, conduct demonstrations (FLD & OFD), vocational training, cognitive and skill development,

contribution to information centre providing information to the farmers, SHGs, liaison with line departments, database development on nutritional status, information needs, women entrepreneurship, etc.

The main constraints faced by home scientists include, insufficient budget; limited encouragement; limited staff, very few research projects; limited role assigned in KVKs; ambiguity in understanding the capabilities and role of home scientists in agricultural sector, etc.

Some of the major future initiatives in (a) education-include establishing international standards in Home Science education, diversification of education in areas of greater employment opportunities, establishing centres of advanced studies for different components, identification of H.Sc. colleges as nodal centres for technology generation to SHGs, etc; (b) research - include, future initiatives on international projects with integrated approach, nutrition security through development of region specific functional foods and educating the rural people, efficient use of energy resources, drudgery reduction through developing women friendly tools and machinery, counselling women for behavioural change in adoption of women empowering technologies, etc; (c) extension – future initiatives include, organization of Regional Research and Extension Conventions for Rural Empowerment, widespread ICT based technology dissemination, revival of nutritional research cell, community research centres in villages, documentation centre for home science, identification and promotion of region specific technologies for enterprise development by women groups, etc.

Future requirements to implement new initiatives include sufficient budget allocation separately for home science, equal weightage for all disciplines of H.Sc. in NET exam and other exams of ICAR, inclusion of H.Sc. subjects for civil service exams, all agricultural research stations should have H.Sc. scientists, filling up all vacant positions in H.Sc., create extra posts for H.Sc. in counselling centres, facilities for setting up community kitchens, adequate space provision for H.Sc. colleges in AUs, Etc.

6. Conclusions

From the points discussed above under different disciplines, the following conclusions emerge:

- Home science discipline should also be opened to boys as their involvement provides wider perspective.
- Nutrition and food are not divorced and nutrition surveillance at all levels is necessary.

- There is inward looking in NARS, shun that they know everything, should be open to ideas from outside and deploy right people for right jobs.
- The sorry plight of social sciences in NARS is on account of lapses on both sides-social scientists (failed to assert to be engaged in high end research) and biological scientists (failed to recognize potential of social scientists).
- Share of social scientists in total cadre strength has declined drastically in NARS, too small a community to make any impact, critical mass is missing which is undesirable.
- Posting one or two social scientists at each centre/station is not useful, to be put at some place (may be at headquarter) to create critical mass and assign work of the different centres/stations.
- Social scientists are not generally liked/welcome, kept away because they ask uncomfortable questions to biological scientists.
- Strengthening PME in NARS can help building research focus and accountability in NARS.
- Not much consultation with stakeholders takes place while framing ARS rules, curricula changes.
- Parent disciplines/basic sciences should be invited/added to agricultural disciplines in recruitment/open lateral entry.
- Social sciences should feed into conscience of other sciences.
- Methodological advances should take place in every discipline to build a strong research base and reviewed periodically to take corrective measures.
- In all commodity research institutes, nutrition expert, home science expert should be posted/involved to help in planning research projects on nutrition.
- There is a need to review the present status and future role and requirements of all branches of social sciences and professional societies should be proactive in undertaking this review and strengthen the professional fraternity.

7. The Strategy and Way Forward

The paper makes a brilliant effort towards taking stock of strengths and weaknesses of social sciences in NARS and to highlight much needed remedies to make them

stronger so as to enable these sciences to get along well with NARS and play central role as partners. The potential impact of social sciences is yet to be realized because there is not enough clarity on their role in the system besides lack of critical mass. Research has to be demand driven to remain continuously relevant and this dimension has to be brought into the science system by none other than social scientists. For this, there is a need to develop a clear strategy. The strategy is to fully understand the potential of social sciences and utilize it by providing all the needed support and encouragement. ICAR has to take action as to what social scientists can do in ICAR institutes and SAUs. Professional Societies have to take action to strengthen social sciences in the system. Vacant posts in social science disciplines in the ICAR institutes and SAUs have to be filled in immediately keeping in view the critical mass required for making impact. Strengthening food and nutrition and home science research and education has become critically important and needs special attention. There is a need to strengthen PG research and education in social sciences in the system for which implementing 4th Dean's Committee recommendations in letter and spirit is inevitable. Similarly, there is an urgent need for capacity development, both national and international, and skill up-gradation of social scientists especially in using advanced methodologies to gain deeper insights on the emerging complex problems and plan for their redressal. There is a strong need to bring in clarity of the role of both the biological scientists as well as the social scientists in the NARS to bring in much needed synergy and convergence for which awareness and communication efforts should continue and intensify. Social scientists and their professional societies should undertake immediately a SWOT analysis of their disciplines and rise to the occasion to overcome all the weaknesses, upgrade their skills in advances in methodologies and new developments in the disciplines, prioritize research areas and promote competence and strive at attaining professional excellence with global bench marks. The role of NIAP, IARI, IASRI, NAARM, MANAGE, NIN, social science departments in SAUs and other institutions engaged in social science research and education in agriculture is vital for effective networking to mainstream social science research in all agricultural science projects and activities. In this endeavour, the support of CGIAR institutions like IFPRI is no less important and they should be involved and taken advantage of more and more in the future. Finally, social sciences require recognition, leadership and guidance at the top and for this restoring the position of ADG (ESM) at ICAR (HQ) will be a small little step, a gesture to send right signal and will demonstrate renewed interest and faith of the system in social sciences.

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Note: The designations and affiliations of the participants are as on the date of BSS.

