POLICY PAPER 86

Mismatch between Policies and Development Priorities in Agriculture

NATIONAL ACADEMY OF AGRICULTURAL SCIENCES, NEW DELHI

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Preface

The achievements in agriculture production including horticulture, dairy and fisheries sector have been spectacular. The increase in production in all sectors especially of food grains to over 273 million tons (estimated) in 2016-17 is a testimony to technology led improvement in productivity and investment in agriculture. These achievements have been enabled by research efforts with benefits varying among crops, commodities and technologies. Though we have become self-reliant in food security but the prevalence of hunger among large population in the country remains a cause of concern. India continues to have serious level of widespread hunger forcing it to be ranked lowly 97 among 118 developing countries for which the Global Hunger Index (GHI) was prepared this year. Over 40% of world's undernourished children are our own. It is estimated that the impact of high under-nutrition in the country annually costs us about 3% of the national GDP. It is observed with concern that though the farming has improved over years but large percentage of farmers are not prepared to opt for agriculture as a profession and the youth is not showing much interest to take to farming as a profession. Agriculture, therefore, needs to be made technology driven and a rewarding profession to attract young talent in the sector. Improving the quality of agricultural education will not only drive agricultural growth but also facilitate developing technologies for sustainable agriculture leading to livelihood and nutritional security and that in long run will help to bridge the widening gap between rural and urban household income. Though we have shed off the stigma of being called 'ship to mouth', India a begging bowel' etc. but have became self sufficient and moved away from an importing country to a net exporter. The problem of food production *vs* food distribution and availability to individuals, food production *vs* food wastage, food security *vs* nutritional security are high on our minds now, which need serious relook from technological and socio-economic angles.

It is with this thought in mind that the National Academy of Agricultural Sciences (NAAS) organised a brainstorming session on 'Our policies, priorities, development claims and ground reality – a relook and time for major corrections' on Dec 16, 2013 at NAAS complex, New Delhi under the convenership of Prof Panjab Singh. Large number of experts/ policy makers/NGOs/ scientists from across various disciplines and institutions participated in discussion and gave their valuable inputs. From the deliberations it emerged that there is a need for a holistic approach to the problem and all issues from production till consumption involving all stakeholders need to be dealt simultaneously and not one after the other which is presented in detail in this policy document. I am hopeful that it will be useful to all Fellowship and other stakeholders.

On behalf of the Academy, I would like to compliment convener Prof Panjab Singh, President, FAARD Foundation for convening and conducting this very important BSS. My thanks are also due to all distinguished participants of BSS, reviewers and to the editors for their support in bringing out this publication. I express special thanks to Prof R.B. Singh for improving and reshaping the final document.

(Panjab Singh)
President

Mismatch between Policies and Development Priorities in Agriculture

1. NATURE OF THE MISMATCH

Food insecurity and poverty are great threats to humanity, and have worldwide serious economic, social and political implications. India, with nearly 200 million undernourished, hungry and poor, accounts for nearly one-fourth of such deprived people globally. Unfortunately, a large part of them are smallholder farmers. And, this unethical situation has persisted over the years. Since mid-1990's, against the overall national GDP growth rate of 7-9%, the agricultural growth rate was only 2.5 to 3.5%. Contribution from agriculture to the GDP thus declined from 23% in 2003-2004 to 14% now. This has resulted in further widening of the income gap between farmers and non-farmers from 1:3 to 1:5. This slower growth in agriculture has caused further marginalization of rural population; widened urban-rural and inter-state divides, and created hot spots of acute distress, indebtedness, deprivation and even farmers suicides. A few of the causes for this agrarian crisis are: continuous decline in investment in agriculture (barring the past two years); neglect of the interest of farmers; deterioration in terms of trade for agriculture; predominance of marginal and sub-marginal farmers; stagnating farmers income which meets hardly 80% of their needs and requirements resulting in debt crisis; ineffective and negligible output price interventions especially in agriculturally underdeveloped regions; and fast decreasing farm holding size, etc. The serious gaps among policies, strategies, programmes, actions and implementation must be filled to remove the glaring developmental asymmetries.

We are also quite aware that public investment, particularly for research and technology and agro-infrastructure development, did not keep pace with the needs of output growth. During past Plans, highest agriculture investment was in irrigation, but there was hardly any increase in net irrigated area, and cropping intensity continues to be low. Although the amount of credit had tripled over the past few years, but the number of borrowers has declined and bulk of the credit has been cornered by large farmers. Moreover, credit flow to the sunrise sectors, such as livestock, remained truncated. Majority of the marginal and sub- marginal resource poor farmers and other rural poor met over 80% of their credit needs from non-formal sources. Layers of debts and unusual stresses have thus intensified especially in rainfed areas. Rural markets and related infrastructure and farmers-market linkages are extremely poor. Further, about 30% of the produce is wasted, and value addition in agriculture commodities is less than 10%.

India has the largest bulge of youth who are unemployed. But, the youth is generally least attracted to agriculture as a profession. Therefore, measures should be initiated which

could help attract and retain the youth in farming by making it knowledge driven and economically rewarding, and by harnessing the power of economy of scale in favour of small and marginal farmers both in production and post-harvest phases of farming. In order to overcome the problem of unemployment of youth, attempt should be to skill each agricultural graduate to become an entrepreneur, rendering them job creators rather than job seekers.

There is a serious mismatch also among record foodgrain production and food availability, food production growth rate, hunger and nutrition indices, and farmer's income and livelihood security. In recent decades, India has averaged annual GDP growth rates of about 7%, whereas the nation's ranking in terms of Human Development Index (HDI) has remained unchanged; we were ranked an abysmal 134 in 1980; we remained at this level even in 2011. It is pertinent to recall the statement of the economist and Nobel laureate Amartya Sen saying "I do not think there's enough clarity on economics here. I do not judge the performance of the Indian economy by growth alone. I am disturbed by the fact that India has the largest ratio of undernourished people in the world. That is why we have to take a broader view. Bangladesh has taken over India in longevity, infant mortality, immunization rate, female illiteracy and all social criteria and our ranking worsened than advanced in the period of high growth rate, then I think the vulnerability of the political economic strategy of catering primarily to growth and not the human capability expansion would get much more tension, and the fact is that human capability expansion is also very critical for economic growth" (TOI Jan.12, 2012).

The asymmetries obviously point fingers at the mismatch among resource allocation, governance, development, and our claims. All this tells us to live with ground reality and find measures which can bring real social growth rather than mere growth. The very policies and priorities are questioned and call for a serious review of our priority setting, policies formulation, and implementation mechanisms in real terms. Large projects of the government *viz.* Mahatma Gandhi National Rural Employment Guarantee Act (MNREGA), National Food Security Mission (NFSM) and farmers' loan waving are questionable on scale of social growth. In fact, I am reminded of an old Chinese saying: "give a man a fish and you feed him for the day. Teach a man how to fish and you feed him for a life time", similarly giving alms to the poor may feed them for a day, but if you want long- term and sustainable solution to the problem, the only way is to set up agriculture raw material based modern factories/ industries in rural settings. There is no substitute for the kind of low-wage manufacturing jobs that Malaysia and South Korea went through earlier, or that China is going through now.

Despite being one of the world's largest producer of milk, wheat, rice, sugar etc., rising food prices kept millions of Indians chained to poverty said a UN report. By 2020, about

37 percent of population will be in age group of 15-29 years and 29 percent of population in 30-49 years and the largest part with rural background. The challenge is to provide them the education and skill and develop job opportunities especially in rural settings. Development of human capital is one of the most crucial instruments of development and education plays an important role at every stage of development. Attempting to achieve economic development in absence of relevant education, the process is like trying to attain economic development in vacuum.

The Quality of education has (direct) relationship with veritable development. Poor quality education results in poor economic growth, inequality, and poverty. Level of education impacts rural- urban migration and brain drain, family size and fertility, agricultural growth, rural development, and human development. Therefore, education cannot be seen merely as an investment of one kind, but is the core element of all developments. Our leaders have emphasized that change in agriculture should be the highest priority in government policy but the roadmap has not been clearly defined. Given the status and centrality of agriculture, detailed action plan for agricultural transformation must be prepared soonest and implemented judiciously.

In order to deliberate critically on these important issues, the NAAS organized a Brain Storming Session (BSS) on 16.12.2013 under the convenership of Prof Panjab Singh. The Policy Paper is the outcome of this BSS and based on the views and experiences shared by the distinguished participants which is recently updated by the convener.

2. DEBATABLE ISSUES

- How to achieve comprehensive sustainable agriculture-led growth with social justice and not just growth should be the basis to decide priorities, programs and resource allocation. When we all say that the return on investment in agricultural R& D is much higher than any other sector then what prevents us investing more in this sector?
- How long the farm sector (farming and farmers) will be neglected and social growth denied? Emphasis on agricultural growth and creation of employment opportunities in rural settings for sustained growth can no longer be ignored.
- How to train and utilize the huge demographic dividend of youth between 15-30 years of age group, which is about 30 percent of our population. Which are the main potential sectors for employment in agriculture and how to assign priorities in resources allocation?
- Production and productivity increases are important but equally or more important is to save produce from different kind of losses. Our plan and strategies to minimize colossal post- harvest and storage losses and our efforts for food processing and value addition for domestic and export needs are yet to get our required attention. Why this neglect and what needs to be done to correct the situation?

- Our policies, plans, strategies, and actions in mitigating degradation of natural resources and adaptation of agriculture to climate change should be explicitly detailed.
- Mismatch between technology generation and technology dissemination for want of institutional architecture and industrial carriers along with needed drivers to take the technology to users are yet to be set in place. This has kept the farm productivity low, which we must not ignore any more.
- How to bring fearless and debureaucratized work environment in science, education and research and ensure efficiency and integrity?
- Agriculture sector is witnessing radical changes and challenges at national and global levels. The demand for agricultural commodities is steeply rising; food preference of next generation consumers are changing and agriculture sector is struggling with decelerating profitability which is dragging its performance. Ensuring household food and nutritional security, bridging urban-rural disparity by increasing farmer's productivity and income, alleviating poverty, minimizing production risk on account of climate change and consequential hazards and ensuring natural resource management and environmental security are the current and emerging challenges before Indian agriculture. Appropriate strategies, policies, institutions and technologies would play a decisive role in facing the challenges.

3. COMPONENTS OF A NEW POLICY FRAMEWORK

3.1 Production and Protection: Save and Grow

Raising agricultural productivity is a key challenge for ensuring national food security. Exploiting the potential yield gap across ecological zones offers a tremendous opportunity. Future productivity gains will need to rely on: narrowing the gap between average farm yield and the experimental yields potential of the crop (i.e. improving technical efficiency) and reversing the slowdown in spending on research and development to generate new yield enhancing technologies (i.e. technological change) . A mission mode program on "bridging the productivity gap" with real missionary zeal and effective monitoring is required to be launched with meticulous planning as a matter of priority. Bringing yet another Green Revolution in eastern India is a welcome step in this direction. This requires development of infrastructure and mechanism to provide effective price support.

There is a need to adopt farming system (system diversification) approach to synergize productivity and profitability, input use efficiency, cropping intensity, resource conservation, employment generation, environmental security, and poverty alleviation. Identification, evaluation and up-scaling of integrated farming systems in different agro- ecological regions is the way forward. Optimal integration of crops, livestock, fishery, forestry etc. is essential for various categories of farmers and farming situation with a viable basket of options.

Targeting rainfed and ecologically marginal areas for dissemination of improved technologies and development of markets would help raise production, increase farm income and reduce regional disparities. These gray areas can soon be made green to harness a second green revolution. Role of technologies, policies and infrastructure would be very important in realising the potential of rainfed agriculture. The Rainfed Area Authority of India is a step forward which needs a proper policy framework, legal and funding supports as well as empowerment for effective coordination and monitoring of all rainfed related programmes run by various ministries/departments in states and central domain.

Mechanization is a potential source of improved labour productivity, higher input use efficiency by timely and precise farm operation. An important area of support for improved access to and use of mechanization in agriculture and allied areas is through leasing market (to reduce lumpiness of machinery investment). Small farm management revolution is an essential component in securing productivity enhancement and household food security.

Over 80 percent of our farms are below one hectare in size, this structure of farm holdings in favour of smaller size calls for a land reforms programme. There has been significant revolutionary development in small farm management in respect of all the subsectors i.e. crop, animal husbandry and fisheries. This process is needed to be encouraged to provide the power of mass production to this mass of small farmers. Institutional mechanism enabling this process should encompass: a decentralized production for increasing the availability of quality seed, breed, planting material, fingerlings with the required insurance coverage; delivery of improved technology and associated services to farmers; and aggregation of produce to improve market access, which essentially should target 'end to end' approach covering production, processing, marketing etc. A holistic producer oriented approach will make wheel rolling in this perspective. A small farm management revolution will help in achieving the objective of inclusive growth.

Climate change will have far reaching consequences for agriculture that will disproportionately affect the poor. Greater risk of crop failures and livestock death are already imposing economic losses and undermining food security, and they are likely to get far more severe as global warning continues. Future productivity gains will need to offset the productivity loss from climate change and still generate sufficient gains to meet rising food demand - a double challenge. Adaptation to climate change will be critical, but agriculture can also help mitigation. Therefore, investment options for both adaptation and mitigation, and policies which can help in reducing the impact of climate change, are urgently needed. Climate resilient suitable crop varieties, cropping system (including diversification), conservation agriculture, run off and run on-farming, precision agriculture, carbon sequestration are some of the R &D aspects which require greater support, besides incentive to small farmers for the adoption of such technologies and practices. Central

government initiative on “climate resilient agriculture” is a step forward in this direction and still greater policy framework is needed in context to farmers participatory research and development, developing early warning systems, weather advisory services etc.

While increased productivity is an essential component of a vibrant agricultural sector, improved post- harvest handling, processing is equally essential to ensure that high quality products reach the markets. Due to lack of impressive post harvest technological perspective, as high as 18-25 percent losses occur in the active food supply chain from production to consumption. At present only about 30 percent of agricultural produce is commercially processed and the net value addition is paltry 10 percent. The present share of processed product in Indian diet is about 15 percent and is likely to rise to 50 percent by 2030 on account of changing demography at workplace and reduced time available for cooking. Technology to integrate agriculture production catchment with processing and marketing is needed so as to reduce post harvest losses, facilitate value addition, product diversification and utilize agro-industries. India’s large market with growing income and changing life style also credits incredible market opportunities for food producers, food processors, equipment makers, food technologist and service providers in this sector.

A three pronged strategy is needed to reduce post- harvest losses- (i) compress supply chain by linking producers and market, (ii) promote processing of food commodities in production catchments to add value before being marketed, and (iii) develop small scale processing units and cold storages using conventional and non-conventional sources. This would require multidisciplinary and multi- stakeholder research for agro –commodities and also investment priorities.

3.2 Investment and subsidies

In recent years, the share of gross capital formation of agriculture and allied sectors in total GCF has hovered between 6 to 8 percent whereas it was around 18 percent during the early1980s. This indicates that the non-agriculture sectors are receiving higher investment as compared to agriculture and allied sectors over the Plan periods resulting in growth disparities. Keeping in view the pressure of high population dependency on agriculture for their sustenance and also that the sector is a potential employer of rural youth in their settings, the need for substantial increase in investment in agriculture cannot be postponed any longer.

Another aspect, which impacts agricultural development, relates to subsides. The biggest of all the input subsides is fertilizer subsidy which has led to an imbalanced use of N,P & K leading to deterioration in quality of land impacting total factor productivity (TFP). The expenditure on subsidies crowds out public investment in agriculture research, irrigation, rural roads and power and subsequently deteriorating quality of public services. Research

studies also show that the marginal returns evident in terms of poverty alleviation or accelerating agriculture growth are much lower from input subsidies than from investments in rural roads or agri R & D or irrigation. There is always a trade-off between allocating money through subsidies or by increasing investments.

Public investment in agriculture decreased from 5 percent of Ag GDP in 1980/81 to 3 percent in 2006 to 2007. This has slightly improved now, but needs greater push. In early 1980s, the share of the public sector and private sector in gross capital formation in agriculture was roughly equal but by 2005 the share of private sector was four times larger than the share of public sector. Moreover, the private sector responds much better and faster to the incentive sector in agriculture. Hence along with bringing in greater public investment in agriculture there is need for bringing in reforms in incentive structures.

Irrigation remains the most dominant component in the overall investment in agriculture as more than 80% is allocated for major and medium irrigation schemes. Even in the case of private investment in agriculture, almost half is accounted for by irrigation (minor, primarily though ground water, but also increasingly drip etc.). Despite this, efficiency of investment has been far from satisfactory and calls for reorientation in allocation which can help improve quality and efficiency of the investment.

While the overall credit to agriculture has been growing phenomenally during the last five years or so, and the interest rates for farmers have also been reduced, the biggest challenge remains in terms of increasing access to credit, particularly for the bottom 45 %. More innovative models are needed to reach this category as they rely largely on informal sector for credit with a high rate of interests.

The significance of agriculture sector in India is not restricted to its contribution to GDP, but its complementarities with other sectors as well. It has far reaching ability to impact poverty alleviation and rural employment. Among others, areas of importance for agriculture growth include investment in education, research, effective transfer of technology along with institutional reforms in the research setup to make it more accountable and geared towards delivery; conservation and enhancement of natural resource base (land, water and biological resource), development of rainfed agriculture, minor irrigation, timely and adequate availability of inputs, support for marketing infrastructure, an increase in flow of credit particularly to the small and marginal farmers. These need to be addressed through the formulation and implementation of suitable policy options.

The transition from traditional to high-value agriculture will be primarily driven by private investment, which is three-fourths of total investment in agriculture. However, to ensure that this happens smoothly and rapidly, government policy needs to act as a catalyst by way of providing greater investment in R&D, roads, public irrigation etc. A strategic vision must factor in three important elements; India's comparative advantage (demographic dividend); efficient market at home and free trade; and environmental sustainability.

3.3 Natural Resources

Future agricultural production program will have to be based on a strategy which leads to increased production without associated ecological and social harms. This will call for conservation and enhancement of ecological foundation essential for agriculture growth through an integrated package of government regulation, education and social mobilization (through panchayat and local bodies).

Land inventories on soil characteristics, climate and hydrological data, vegetation cover, land capability / suitability and land irrigability need to be prepared and updated regularly for relevant reform measures from time to time. Such a planning should also attempt to solve general problem of under development and arrest area specific non-sustainable trends and patterns of under development. Land reforms, land administration and land acquisition should become more responsive to land quality to promote integrated management, planning, implementation and monitoring. Thus, the Land reforms policy needs to be revisited to address issues like land tenure, land records etc.

Since land holding size is declining and fragmenting owing to laws of inheritance, a provision for contract farming may be included in the policy document. Similarly, mechanism of regulating special economic zones (SEZs) should be developed to prevent any adverse impacts on prime agricultural lands. Land management policies should also aim at determining an economically viable size of land holding in different agro-ecological zones to meet the basic needs of an average family. Appropriate biological measures need to be included as an integral component of land development. Soil use policy framework is also required for sustainable use of soil resources. Subsidizing soil testing fee, soil health card, rapid soil testing kit, remote sensing and geographical information based decision support are ways to faster program on assessment, mapping and monitoring land use performance under given ecological conditions.

Long term sustainability of water resources and its ability to sustain future food and water requirements is of great concern. High inefficiencies in water delivery, distribution and nonfarm use are adversely affecting agricultural production besides impacting land, soil and water quality base of agriculture. Rain water management is crucial to economic efficiencies of all kinds of water bodies. Water use also needs to be improved in rainfed agriculture which accounts for about 42 percent of agricultural production. Efforts are needed to enhance policy, technical, governance, regulation aspects of sustainable water management and use through incorporation of broader river basin management, enhanced water use efficiency, local water user associations and improved use of shared water use efficiency.

3.4 Linking farmers to markets and strengthening value chain

Orientation of agricultural development should shift from increasing production to raising farm income. This is important to check the widening rural-urban disparity and to diversify rural livelihood options covering crop, livestock, fisheries and horticulture activities. Hence, linking farmers to market must receive priority in future policy formulation. In market driven economic scenario, changes in demand pattern, institutions and policies will be as important source of growth as technological change. New knowledge and emerging demand pattern will create better opportunities and incentive to agricultural activities (resource, service, production, processing, distribution etc.) in an effective manner, beside such a venture will also facilitate bridging gap between technology leading to production and that of post harvest processing, value addition and product diversification. Review of ongoing micro- financial reforms including price structure, scaling relevant agribusiness models for market integration, safety nets, market information network and market intelligence, expansion of infrastructure (road, electrification, primary processing centres, godowns etc.), strengthening produce organizations, self help groups and access to finance are some of the important aspects in this regard.

A new orientation needs to be given to the schemes meant for the betterment of farmers. The policy initiative in future should help develop the skills and knowledge of resource poor farmers, increase their income levels and help empower them to enhance their role in social, economic and political systems. In future, new initiatives for economic development and social empowerment should include farm labours, beside the farmers.

3.5 Institutions

Growing small holdings , decelerating farm profitability, rising demand of agricultural commodities, increasing uncertainties, unfolding globalization and emerging private sector in agriculture research and agribusiness call for designing policies, developing institutional mechanism, evolving decision making process, mobilising political support, and improving governance of service providers in the value chain. Emergence of the intellectual property rights also needs to be converted into an opportunity. Policy formulation, implementation mechanism and ground level action must be given equal emphasis for successful interventions. Any policy and institutional change should be transformational in nature rather than touching upon peripheral issues. A systematic approach is needed to evolve long term development strategies to overcome problems/constraints faced by farmer and to that extent, policy implementation be placed to resolve the problems. Institutional mechanism should entail the study of impacts of policies and programs.

One of the important implications from present agriculture scenario is growing inter dependence among agriculture, social, and economic development. Rapid developments

in Indian economy will influence the nature of changes in agriculture, the actors in development being, sources of knowledge, institutions and even scale of operation. Stagnant agriculture with a high growth in non-agriculture sector may not be sustainable because of deteriorating investment climate due to social unrest on account of rising unemployment and economic inequality and lack of market demand. Therefore, agriculture sector must contribute substantially to the overall economic growth. This could be possible through: persistent growth in agricultural productivity; enhanced farm income through production, diversification, value addition and better market access; sharing employment opportunities from agricultural to other sectors of economy, including rural non- farm sector; reducing risk and vulnerability; enhancing environmental services and sustainability (conserving our natural resources –land, water, biodiversity, non-renewable energy & environmental need).

Changes in demand pattern, institutions and policies will be as important source of growth as technical change in a market driven economic scenario. New knowledge and emerging demand pattern will create better opportunities and incentives to organize agricultural activities in an efficient manner. These process changes or innovations will take place across all types of institutions, including economic, social, political, legal etc. and will add value to existing practices and improve their outcome. The capacity to generate, integrate and apply new knowledge will be critical to the innovation process. Hard core infrastructure, facilitating regulation and other domains like information services, credit and rural institution services, social (i.e. gender) group etc. will also influence the innovation process.

Every calamity presents also an opportunity for new innovations. An innovative small farmers self help groups based agriculture is the answer to threat to reduced crop yield and uncertain food security arising from adverse change in climate. Access to essential services is critical to enhance productivity and profitability. A person is poor because his endowments of capital, land, labour and skill are meagre, also because his access to public goods, services, and natural resource is limited. Often, a poor person is trapped in the prison of illiteracy. In case of female, disease and ill health prevents her from getting the most out of the one asset she has, her labour. Without training and skill, she cannot aspire to do a better job. Without an all-weather road, that connects her habitation to the nearest market, she cannot get a fair price for her produce. Without electricity and access to credit, her ability to enhance productivity of land or of artesian activity is limited. So is the case with drainage, water supply, protection of life and property without which she cannot function effectively. Thus access to basic facilities such as health, education, clean drinking water etc. impact directly on welfare, in the longer run, it determines economic opportunities for the future. Without access to these services one cannot be considered to have equality of opportunity. Since access to these services for majority of population,

particularly rural poor, depends not only upon their income levels but upon the delivery of these services through publicly funded system. Therefore, futuristic strategies and policy regulations must address in commensuration with expansion in supply of these services through joint centre-state interventions.

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

51. Carrying Capacity of Indian Agriculture - 2011
52. Biosafety Assurance for GM food Crops in India - 2011
53. Ecolabelling and Certification in Capture Fisheries and Aquaculture - 2012
54. Integration of Millets in Fortified Foods - 2012
55. Fighting Child Malnutrition - 2012
56. Sustaining Agricultural Productivity through Integrated Soil Management - 2012
57. Value Added Fertilizers and Site Specific Nutrient Management (SSNM) - 2012
58. Management of Crop Residues in the Context of Conservation Agriculture - 2012
59. Livestock Infertility and its Management - 2013
60. Water Use Potential of Flood-affected and Drought-prone Areas of Eastern India - 2013
61. Mastitis Management in Dairy Animals - 2013
62. Biopesticides – Quality Assurance - 2014
63. Nanotechnology in Agriculture: Scope and Current Relevance - 2014
64. Improving Productivity of Rice Fallows - 2014
65. Climate Resilient Agriculture in India - 2014
66. Role of Millets in Nutritional Security of India - 2014
67. Urban and Peri-urban Agriculture - 2014
68. Efficient Utilization of Phosphorus - 2014
69. Carbon Economy in Indian Agriculture - 2014
70. MOOC for Capacity Building in Indian Agriculture: Opportunities and Challenges - 2014
71. Role of Root Endophytes in Agricultural Productivity - 2014
72. Bioinformatics in Agriculture: Way Forward - 2014
73. Monitoring and Evaluation of Agricultural Research, Education and Extension for Development [AREE4D] - 2015
74. Biodrainage: An Eco-friendly Tool for Combating Waterlogging - 2015
75. Linking Farmers with Markets for Inclusive Growth in Indian Agriculture - 2015
76. Bio-fuels to Power Indian Agriculture - 2015
77. Aquaculture Certification in India: Criteria and Implementation Plan - 2015
78. Reservoir Fisheries Development in India: Management and Policy Options - 2016
79. Integration of Medicinal and Aromatic Crop Cultivation and Value Chain Management for Small Farmers - 2016
80. Augmenting Forage Resources in Rural India: Policy Issues and Strategies - 2016
81. Climate Resilient Livestock Production - 2016
82. Breeding Policy for Cattle and Buffalo in India - 2016
83. Issues and Challenges in Shifting Cultivation and its Relevance in the Present Context - 2016
84. Practical and Affordable Approaches for Precision in Farm Equipment and Machinery - 2016
85. Hydroponic Fodder Production in India - 2017

Status / Strategy Papers

1. Role of Social Scientists in National Agricultural Research System (NARS) - 2015
2. Towards Pulses Self-sufficiency in India - 2016
3. Strategy for Transformation of Indian Agriculture for Improving Farmers Welfare - 2016
4. Sustaining Soybean Productivity and Production in India - 2017
5. Strengthening Agricultural Extension Research and Education - The Way Forward - 2017

Policy Brief

1. To Accelerate Utilization of GE Technology for Food & Nutrition Security and Improving Farmers' Income - 2016

NAAS Documents on Policy Issues*

1. Agricultural Scientist's Perceptions on National Water Policy - 1995
2. Fertilizer Policy Issues (2000-2025) - 1997
3. Harnessing and Management of Water Resources for Enhancing Agricultural Production in the Eastern Region - 1998
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