

Annual Report

2012 - 13



National Centre for Agricultural Economics and Policy Research
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PREFACE



Agriculture scenario in India has shown marked changes during recent years. The sector has recovered from deceleration in the growth which reached very low bottom level around the year 2005-06 and now heading towards targeted growth rate of 4 per cent. Close to one third of Indian states have witnessed more than 4% annual growth in agriculture during the last ten years. These achievements are result of favorable policy environment and progress of agricultural technology in the country. I take great pride in sharing the information that the model for achieving 4% growth rate in agriculture during 11th Plan was prepared by NCAP. Its actualization resulted from the recommendation based on the model.

This has strengthened the resolve and morale of NCAP staff to contribute vigorously in the area of agricultural policy.

This report provides a glimpse of Centre's major achievements during the year 2012-13. Besides undertaking research in the area of agricultural economics and policy, NCAP has couple of other accomplishments during this year. The Centre has provided policy inputs to various Central Ministries and three states. NCAP prepared "Vision 2050 for Agriculture R&D" which is used as a basis for preparing Vision 2050 of various ICAR Institutes. NCAP also developed framework for assessing performance of NARS institutes. Faculty of the Centre participated in several policy debates and discourses and also undertook research based policy advocacy. NCAP faculty has played a leading role in creating proper understanding and awareness among public on various agricultural issues through participation in T.V. debates and newspaper reporting.

The capacity development activity of the Centre has expanded beyond NARS as the Centre is regularly imparting training for Indian Economic Services (IES) Officers. Director NCAP has been a resource person for SAARC, G-20 and couple of other international bodies besides responding to needs of Department of Agriculture and Cooperation (DAC), Ministry of Finance and Ministry of Commerce.

In terms of research the Centre undertook 19 research and consultancy studies during the year. These include studies sponsored by SPIA FAO, FAO RAP, IFPRI, ICRISAT and UNCTAD.

The Centre continues to receive overwhelming support from the ICAR in terms of resources, guidance and various other facilities. We are grateful to Dr. S. Ayyappan, Director General, Indian Council of Agricultural Research (ICAR) and Secretary, Department of Agriculture Research and Education (DARE), Government of India for involving NCAP in almost all strategic matters related to agriculture R&D and development. Various tasks assigned by Dr. Ayyappan to this Centre have enabled us to prove our worth and relevance for NARS and play much larger role in national and international scene. We offer our gratitude to Dr. Arvind Kumar, Deputy Director General (Education), for his continued support in achieving mandate of the Centre.



My colleague Dr. Raka Saxena, Senior Scientist, compiled and edited the material presented in the report. I appreciate her dedication and hard work and various suggestions for improving quality of the manuscript. The document was arranged and formatted and systematically organized by Mr. Ajay Tanwar and Mr. Deepak Tanwar. I also acknowledge the contribution of all the scientists and other staff for various achievements of NCAP during the year 2012-13. I thank all of them and others who have helped directly or indirectly in bringing out this report.

A handwritten signature in blue ink, which appears to read 'Ramesh Chand', is located to the right of the main text block.

(Ramesh Chand)
Director



LIST OF ACRONYMS

ABARES	Australian Bureau of Agricultural and Resource Economics and Sciences
ADB	Asian Development Bank
AERA	Agricultural Economics Research Association
AICIL	Agriculture Insurance Company of India Limited
AKMU	Agricultural Knowledge Management Unit
AMIS	Agricultural Market Information System
ANGRAU	Acharya N G Ranga Agricultural University
APAARI	Asia Pacific Association of Agricultural Research Institutions
ARIS	Agricultural Research Information System
ASEAN	Association of South-East Asian Nations
ASRB	Agricultural Scientist Recruitment Board
BCR	Benefit-Cost Ratio
BE	Biennium Ending
BHU	Banaras Hindu University
BMGF	Bill & Melinda Gates Foundation
CACP	Commission on Agricultural Cost and Prices
CCOS	Coordination Committee for Organization of Studies
CeRA	Consortium for e-Resources in Agriculture
CES	Consumer Expenditure Survey
CGIAR	Consultative Group on International Agricultural Research
CMIE	Centre for Monitoring Indian Economy
CP	Control Programme
CPF	Country Programming Framework
CRIDA	Central Research Institute for Dryland Agriculture
CRS	Constant Return to Scale
CSO	Central Statistical Organisation
DAC	Department of Agriculture and Cooperation
DARE	Department of Agricultural Research and Education
DMU	Decision Making Units



DPSIR	Driving Force - Pressure - State - Impact- Response
DWR	Directorate of Wheat Research
EPW	Economic and Political Weekly
ERNET	Education and Research Network
ESCAP	Economic and Social Commission for Asia
ESI	Environmental Sustainability Index
ETL	Extraction, Transformation, Loading
FAO	Food and Agriculture Organization of United Nations
FMD	Foot and Mouth Disease
GCA	Gross Cropped Area
GDP	Gross Domestic Product
GIDR	Gujarat Institute of Development Research
GoI	Government of India
GUI	Graphic Use Interface
HRD	Human Resource Development
IARI	Indian Agricultural Research Institute
IASRI	Indian Agricultural Statistics Research Institute
ICAR	Indian Council of Agricultural Research
ICMR	Indian Council of Medical Research
ICRIER	Indian Council for Research on International Economic Relationships
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
ICT	Information and Communication Technology
IDS	Institute of Development Studies
IES	Indian Economic Service
IFPRI	International Food Policy Research Institute
IGIDR	Indira Gandhi Institute of Development Research
IIPR	Indian Institute of Pulse Research
IMC	Institute Management Committee
IP	Intellectual Property
IPM	Integrated Pest Management
IPR	Intellectual Property Rights
IRC	Institute Research Council
ISAE	Indian Society of Agricultural Economics
ISEC	Institute for Social and Economic Change
IWMI	International Water Management Institute



JICA	Japan International Cooperation Agency
JNU	Jawaharlal Nehru University
JSC	Joint Staff Council
KCC	Kisan Credit Card
KSAMB	Karnataka State Agricultural Marketing Board
MAFSU	Maharashtra Animal and Fishery Sciences University
MC	Management Committee
MGNREGS	Mahatma Gandhi National Rural Employment Guarantee Scheme
MSP	Minimum Support Price
MULLaRP	Mungbean, Urdbean, Lentil, Lathyrus, Rajmash and Field Pea
NAAS	National Academy of Agricultural Sciences
NAIP	National Agricultural Innovation Project
NARS	National Agricultural Research System
NASC	National Agricultural Science Centre
NCAER	National Council for Applied Economic Research
NDRI	National Dairy Research Institute
NIC	National Informatics Centre
NICRA	National Initiative for Climate Resilient Agriculture
NIN	National Institute of Nutrition
NIPFP	National Institute of Public Finance and Policy
NISCAIR	National Institute of Science, Communication and Information Resources
NISTADS	National Institute of Science, Technology and Development Studies
NPL	National Physical Laboratory
NPS	National Pension System
NPV	Net Present Value
NSA	Net Sown Area
NSDP	Net State Domestic Product
NSSO	National Sample Survey Organisation
OTA	Over Time Allowance
PAU	Punjab Agricultural University
PDS	Public Distribution System
PME	Prioritization, Monitoring and Evaluation
QRT	Quinquennial Review Team
R & D	Research and Development
RAC	Research Advisory Committee



RFD	Results Framework Document
S&T	Science & Technology
SAARC	South Asian Association for Regional Co-operation
SAC	SAARC Agriculture Centre
SACs	South Asian Countries
SAUs	State Agricultural Universities
SCI	Science Citation Index
SHGs	Self Help Groups
SMS	Short Message Service
SPIA	Standing Panel on Impact Assessment
SRI	System of Rice Intensification
SRR	Seed Replacement Ratio
TCARD	Technical Committee on Agricultural and Rural Development
TE	Triennium Ending
TECHEF	Technical Efficiency
TFP	Total Factor Productivity
TNAU	Tamil Nadu Agricultural University
UNCTAD	United Nations Conference on Trade and Development
VDSA	Village Dynamics in South Asia
VOC	Value of Crop Output
V-PAGE	Visioning, Policy Analysis and Gender
VRS	Variable Returns to Scale
WBSTFP	Web Based Software for Computation of Total Factor Productivity
WDPs	Watershed Development Programmes
WEF	World Economic Forum
WIGISAT	Wine Grape Insurance Structuring Automation Tool
WSTs	Water-Saving Technologies



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EXECUTIVE SUMMARY

The National Centre for Agricultural Economics and Policy Research (NCAP) is making persistent efforts to sustain excellence in agricultural economics and policy research in the country. The Centre serves as a policy think tank and helps the ICAR through credible research to actively participate in policy debates and decisions and in monitoring and interpreting the research impacts at various levels. The Centre sensitizes policy planners in the country and ICAR about the emerging changes and concerns related to agriculture and farmers. Besides helping ICAR, the Centre also provides policy inputs to several other public sector organisations, Departments, Ministries and various state governments.

The staff of the Centre included 20 scientists, 18 other staff members and the research project staff in the year 2012-13. The total expenditure of the Centre, including externally funded projects, during the year was Rs 673 lakh.

A Research Advisory Committee, chaired by Prof. V S Vyas, distinguished economist and Member, Prime Minister's Economic Advisory Council, guides the Centre in its research programmes, and a Management Committee guides its overall functioning. Besides, a number of committees (mandated by ICAR and internal) facilitate decentralised management of the Centre.

Research is conducted at the Centre under five broad themes, viz. technology policy, sustainable agricultural systems, markets and trade, institutional change and agricultural growth and modelling. During the year 2012-

13, the Centre undertook 14 research projects and completed five consultancy research studies. It has not only maintained but also increased the linkages and collaborations with many institutions in India and abroad. Besides, it organised a number of workshops, trainings, brainstorming sessions and policy discussions. A brief account of research and other activities undertaken by the Centre during 2012-13 is given below.

- The study on research priority setting compared existing and normative allocation of agricultural research resources across major states of the country and suggested increase in share of Uttar Pradesh, Madhya Pradesh, Rajasthan, Bihar, West Bengal, Odisha, Chhattisgarh and Jharkhand. The proposed reallocation of resources shows large reduction in shares of Maharashtra, Tamil Nadu, Punjab, Haryana, Kerala, Andhra Pradesh, Gujarat, Karnataka, Assam, and all hill states to varying degree. Interestingly, the states which gain in proposed allocation except West Bengal are in the development stage of agriculture.
- In a study on district-wise agricultural productivity, striking variations were observed across districts. Barmer remained the lowest productive district in TE 2007 with Rs. 2068/ha and Karnal recorded the highest productivity of Rs. 107376/ha. The role of modern inputs, viz. improved seed, fertilizer, pesticides and mechanization, in fostering growth in agricultural productivity was clearly visible in the study.

- Another study concluded that agricultural R&D for less-developed countries is at crossroads. The technology gap between the developed and the developing countries is increasing, both quantitatively as well as qualitatively. If the current R&D dichotomies continue, it may dispatch agriculture in many developing countries to technological orphanage.
- Another study examined the varietal diversity and identified dominant varieties of chickpea in Madhya Pradesh. It was found that 63.22 per cent of the net sown area was under chickpea, out of which one-third area was under Kabuli type chickpea and two-third of chickpea area was under non-Kabuli. Lack of availability of seeds of modern varieties is one of the main constraints to their adoption.
- Use of appropriate information and inputs at required time has brought more efficient ways of production and sale of produce. To harness the full potential of mobile and to pave the way for m-agriculture (Mobile based agriculture), awareness cum training programs need to be organized to encourage farmers in accessing information on weather and agricultural technologies. Mobile applications in agriculture using local languages will be highly beneficial.
- Comparative cost-return structure of baby corn with respect to other crops revealed that baby corn cultivation can improve the livelihood security of the farm families to a great extent by providing net returns of Rs 68,725/acre. Reduction in marketing margin and increase in share of farmers in consumer price has the scope to raise profitability of baby corn manifolds.
- Another study indicated positive relationship between access of farm women to information and communication technologies (ICTs) and farm size. ICTs had helped farm women in selling their farm produce, especially vegetables, at competitive market rates and facilitated adoption of improved technologies for vegetables production. The important drivers identified affecting farm women's access to ICTs are: education, income, structure of the family and caste.
- Kerala's economy is transforming from an agrarian one to a heavily service oriented one. The level of self-sufficiency of the state on its staple food, rice was found to be just 17 per cent, and that on pulses was less than 1 per cent. The future projections on supply-demand balance of most of the food commodities indicate further aggravation of the already well articulated concern of Kerala touching the worst levels of food self-sufficiency, if existing trends continue for long.
- IPM is effectively used in about 3-5% of net sown area and bio-pesticides account for only 2.89% of the pesticides sales in the country. Greater integration of research, education, extension and programs (policies) for IPM is emphasized.
- Plant protection and seed replacement rates were identified as the major constraints to increasing pulse production. The major research activity is to develop and test pulse varieties suitable for different agro-ecosystems in the country.
- Trends in the monthly temperature in different agro-ecologies of India were assessed for the period 1901-2002. In general, it emerged that Indian winters are becoming hotter. There was a statistically significant rise (1°C to 1.5°C) in the temperature in most of the months during October-April.
- The drought index was constructed for each district (1970 base districts) for the kharif season. During the 1970s and 1980s

droughts were less frequent but were more widespread. These, however, became more frequent during the 1990s and 2000s, but less widespread.

- Panel data on area and production of 19 major crops for 200 districts (at 1970 base) for the period 1969-2005 were used to assess the impact of climate change on agricultural productivity. At all-India level, 1 degree rise in temperature could cause a reduction in agricultural productivity by 12-13 per cent until the early 1990s. The effect, however, became stronger (15.5%) afterwards.
- Technology adoption and improvement in efficiency in production are important strategies to raise agricultural production and to improve food and nutritional security. Large variations in the efficiency were found across agro-ecologies. The highest technical efficiency was observed in case of hill and mountainous region and the lowest in the case of rainfed region. The findings of the study revealed significant positive role of education, infrastructure and durable capital assets in improving the technical efficiency.
- SAARC countries have moved further to liberalize trade and investment in the region and they have signed “South Asia Free Trade Agreement” in January 2004. The major factor for low volume and low share of intra-regional trade seems to be the poor trade facilitation for intra-regional trade, like efficiency of custom, other border procedures, quality of transport and IT infrastructure etc. Liberal and conducive environment for FDIs in the area of food chain development and food processing and more liberal trade will not only raise intra-regional trade but also help in addressing food deficit in SAARC countries.
- The Karnataka State Agricultural Marketing Board has started disseminating agricultural prices to the farming community through free mobile SMS, which has made farmers save marketing time and reduced cost of search of information.
- The super markets are adopting direct marketing models with backward linkages saving farmers from market cost, other charges and complete elimination of middlemen. Farmers supplying to super markets have advantages getting technical guidance, market information on prices, perfect weights, spot payments etc.
- The relationship between poverty and livestock income showed that the head count poverty is negatively and significantly associated with income from livestock as well as crops. The marginal effect of livestock on poverty reduction is -0.36 against -0.25 for crops, implying that growth in the livestock sector has a larger impact on poverty reduction.
- The productivity of meat animals such as sheep, goats and pigs in India is substantially less compared to world averages. There was a sharp deceleration in the yield growth of dairy animals. The growth in milk yield of crossbred cows decelerated from 1.8% during the 1990s to 0.7% during the 2000s and of buffaloes from 1.7% to 1.2%. The productivity of meat animals (sheep, goats and pigs) has remained stagnant for quite long.
- The role of PDS in meeting the consumption requirement of households has increased over time. In general, the penetration of PDS has increased in almost all states of country over time and the share of PDS grain in household food consumption has increased. The findings suggest that the PDS has proved to be one of the most effective instruments of government policy over the



years in stabilizing of foodgrain prices and making their availability to consumers at affordable price.

- Another study estimated the risk involved in production of various crops at disaggregate and aggregate level. Agricultural insurance schemes launched in the country have served the farmers in a limited way only. Valued-added services like weather forecasts, agro-advisories could be bundled with crop insurance, for popularizing crop insurance and concrete action is required from the government, in terms of a suitable law, like 'agriculture risk protection act', etc.
- Growth rate of agriculture has improved considerably after 2004-05. Growth rate in Net State Domestic Product (NSDP)-Agriculture in six out of 20 major states was higher than the national target. These states are Gujarat, Rajasthan, Chhattisgarh, Madhya Pradesh, Andhra Pradesh and Jharkhand. One fifth states are close to the national target of 4% growth rate in agriculture. States of Kerala, UP, Uttarakhand and J&K achieved less than 2 per cent growth in agriculture sector during 2001 to 2011.
- Estimates of undernutrition (calorie deficiency) and malnutrition (protein deficiency) were prepared for various income groups using unit-level NSSO data. The average intake levels of poor households were at levels even lower than the FAO norm of 1800 Kcal. Calorie deficiency was higher for rural areas than urban areas. More than half of the income poor population was found to be calorie deficient in both rural and urban areas across all the choices of norms. Incidence of undernutrition and malnutrition was much higher based on ICMR-NIN norm. It was also observed that the percentage of

population with inadequate protein intakes was higher in urban households as compared to their rural counterparts.

- The patterns of calorie as well as protein intake do not depict a clear trend for both rural and urban households. Between 1983 to 2009-10, the calorie and protein consumption has declined in the rural areas and increased in the urban areas. The consumption of fat consistently increased overtime both in rural and urban areas.
- Technology had been the main source of agricultural growth in the 1980s. Diversification (from lower-value to higher-value crops) was the second largest source of growth (26%); followed by area expansion (17%). Later, there was also a sharp increase in the contribution of prices to growth mainly because of terms of trade in favor of agriculture. Diversification, on the other hand, consolidated its share in agriculture growth. There was also a sharp increase in the contribution of prices to growth mainly because of terms of trade in favor of agriculture. In the 2000s, the contribution of prices declined drastically suggesting that price-led growth cannot sustain in the long-run.
- The centre organized two one-week training programme on 'core issues in the agricultural sector' for the officers of the Indian Economic Service' funded by the Ministry of Finance, Government of India. The centre also conducted a training programme on Field Survey, Electronic Compilation and Analysis of Data for the field staff of ICAR-ICRISAT project on Tracking Change in Rural Poverty in Household and Village Economies in South Asia. Besides, the Centre conducted several theme/project-wise trainings, interaction meetings, workshops, etc. which helped in capacity building of the project partners.



- As part of the dissemination of research output, the Centre published one policy paper during the year under report. The staff of the Centre published 20 research papers in leading journals of national and international repute and contributed 11 book chapters/ popular articles. More than 15 presentations were made in national and international conferences. The scientists of the Centre were involved in a number of professional and policy interactions and projects. The website of NCAP (www.ncap.res.in) was regularly updated and all the publications of the Centre were uploaded on the website.
- Faculty of the Centre participated in several policy debates and discourses and also undertook research based policy advocacy. NCAP faculty has played a leading role in creating proper understanding and awareness among public on various agricultural issues through participation in T.V. debates and newspaper reporting. Director NCAP has been a resource person for SAARC, G-20 and couple of other international bodies besides responding to needs of Department of Agriculture and Cooperation (DAC), Ministry of Finance and Ministry of Commerce.

विशिष्ट सारांश

राष्ट्रीय कृषि आर्थिकी एवं नीति अनुसंधान केन्द्र (एनकैप) देश में कृषि आर्थिकी एवं नीति अनुसंधान में उत्कृष्टता को बढ़ावा देने के लिए लगातार प्रयास कर रहा है। केन्द्र एक नीति विचारक संस्थान के रूप में अपनी सेवाएं प्रदान करता है तथा भारतीय कृषि अनुसंधान परिषद (भाकृअप) को, विश्वसनीय अनुसंधान के माध्यम से, नीति संबंधी वाद-विवादों एवं निर्णयों तथा विभिन्न स्तरों पर अनुसंधान के प्रभावों की निगरानी एवं विवेचन में सक्रिय रूप से सहभागिता करने के लिए सहायता देता है। केन्द्र देश में नीति निर्माताओं तथा भाकृअप को उभरते बदलावों तथा कृषि एवं कृषकों से संबंधित समस्याओं के बारे में अवगत कराता है। भाकृअप को सहायता देने के अतिरिक्त, केन्द्र अन्य अनेक सार्वजनिक क्षेत्र के संगठनों, विभागों, मंत्रालयों तथा राज्य सरकारों को नीति संबंधी निविष्टियां (इनपुट्स) भी उपलब्ध करता है।

वर्ष 2012-2013 के दौरान केन्द्र में 20 वैज्ञानिक थे, 18 अन्य स्टॉफ तथा अनुसंधानिक परियोजना स्टॉफ था। इस वर्ष के दौरान, केन्द्र का वाह्य वित्तपोषित परियोजनाओं सहित कुल व्यय रु. 673 लाख था।

प्रोफेसर वी. एस. व्यास, एक प्रख्यात अर्थशास्त्री और प्रधानमंत्री आर्थिक सलाहकार परिषद के सदस्य, की अध्यक्षता में एक शोध सलाहकार समिति केन्द्र को उसके शोध कार्यक्रमों में मार्गदर्शन देती है और एक प्रबंधन समिति केन्द्र की समग्र कार्यप्रणाली में मार्गदर्शन करती है। इसके अलावा, विभिन्न समितियां (भाकृअप तथा आंतरिक रूप से अधिदेश प्राप्त) केन्द्र के विकेन्द्रीकृत प्रबंधन में सहायता देती हैं।

केन्द्र में पांच व्यापक विषयों अर्थात्, प्रौद्योगिकी नीति, संधारणीय व टिकाऊ कृषि प्रणालियां, बाजार एवं व्यापार, संस्थानिक बदलाव एवं कृषि विकास तथा मॉडलिंग के अंतर्गत अनुसंधान किया जाता है। वर्ष 2012-13 के दौरान, केन्द्र द्वारा 14 अनुसंधानिक परियोजनाएं चलाई गईं और 5 परामर्शी अनुसंधानिक

अध्ययन पूरे किए गए। केन्द्र ने देश तथा विदेश में अनेक संस्थानों के साथ न केवल सहलग्नताओं एवं सहयोगों को बढ़ाया है अपितु उन्हें कायम भी किया है। इसके अतिरिक्त, केन्द्र द्वारा अनेक कार्यशालाएं, प्रशिक्षण, प्रतिभा-उन्नयन सत्र तथा नीति पर चर्चाएं आयोजित की गईं। वर्ष 2012-13 के दौरान केन्द्र द्वारा किए गए अनुसंधान तथा अन्य गतिविधियों का एक संक्षिप्त उल्लेख नीचे किया जा रहा है :

- अनुसंधानिक प्राथमिकता देने से संबंधित अध्ययन में, देश के प्रमुख राज्यों के कृषि अनुसंधान संसाधनों के वर्तमान तथा मानकीय आवंटन की तुलना की गई और उत्तर प्रदेश, मध्य प्रदेश, राजस्थान, बिहार, पश्चिम बंगाल, ओड़िशा, छत्तीसगढ़ तथा झारखंड का अंश बढ़ाने का सुझाव दिया गया। संसाधनों के प्रस्तावित पुनः आवंटन से महाराष्ट्र, तमिलनाडु, पंजाब, हरियाणा, केरल, आंध्र प्रदेश, गुजरात, कर्नाटक, असम तथा विभिन्न पर्वतीय राज्यों के अंशदानों में जबर्दस्त कमी आई है। यह उल्लेखनीय है कि प्रस्तावित पुनः आवंटन से लाभांशित राज्य, पश्चिम बंगाल को छोड़कर, कृषि की दृष्टि से विकासशील हैं।
- जिला-वार कृषि उत्पादकता के अध्ययन में, सभी जिलों में काफी ज्यादा विविधताएं देखी गईं। वर्ष (टीई) 2007 में रु. 2068/हेक्टे. के साथ बाड़मेर सबसे कम उत्पादक जिला बना रहा, जबकि करनाल में रु. 1,07,376/हेक्टे. की सबसे अधिक उत्पादकता दर्ज की गई। अध्ययन में यह कहा गया है कि कृषि उत्पादकता में बढ़ोतरी के लिए आधुनिक निविष्टियों जैसे, उन्नत बीज, उर्वरक, कीटनाशकों तथा यंत्रिकरण की भूमिका सराहनीय थी।
- अन्य अध्ययन के निष्कर्ष में यह पाया गया है कि कम विकसित देशों के लिए कृषि संबंधी शोध एवं विकास चौराहे पर खड़ा है। विकसित एवं विकासशील देशों के परस्पर मात्रात्मक तथा गुणवत्तात्मक दृष्टि

- से प्रौद्योगिकी का अंतराल बढ़ता जा रहा है। यदि वर्तमान शोध एवं विकास द्विभाजन इसी तरह आगे चलता रहा तो इससे अनेक विकासशील देशों में प्रौद्योगिकी की दृष्टि से कृषि अनाथ हो जाएगी।
- अन्य अध्ययन में विविधात्मक विविधता की समीक्षा की गई और उसमें मध्य प्रदेश के लिए चने की प्रमुख किस्मों की पहचान की गई। अध्ययन में यह पाया गया कि कुल बुवाईगत क्षेत्र में चने के अंतर्गत 63.22 प्रतिशत क्षेत्र था, जिसमें से एक-तिहाई (1/3) क्षेत्र काबुली चने के अंतर्गत तथा दो-तिहाई (2/3) क्षेत्र गैर-काबुली चने के अंतर्गत था। आधुनिक किस्मों को अंगीकार न करने की मुख्य वजह उनके बीजों की अनुपलब्धता है।
 - उपयुक्त सूचना तथा निविष्टियों के यथासमय प्रयोग के कारण उत्पादन तथा उत्पाद की बिक्री के संबंध में अधिक सुव्यवस्थित आयाम सृजित हुए हैं। मोबाइल की पूर्ण क्षमता का लाभ लेने तथा एम-कृषि (मोबाइल आधारित कृषि) का मार्ग प्रशस्त करने हेतु किसानों के लिए जागरूकता एवं प्रशिक्षण कार्यक्रम चलाए जाने की आवश्यकता है ताकि उन्हें मौसम और कृषि प्रौद्योगिकियों पर सूचना का प्रयोग करने के लिए प्रोत्साहित किया जा सके। कृषि के लिए स्थानीय भाषाओं में मोबाइल के अनुप्रयोग काफी ज्यादा लाभकारी होंगे।
 - बेबी कॉर्न की अन्य फसलों के साथ लागत-प्रतिफल के तुलनात्मक अध्ययन से यह पता चलता है कि रु. 68,725/एकड़ का शुद्ध लाभ उपलब्ध कराकर बेबी कॉर्न की खेती, खेतिहर परिवारों की आजीविका सुरक्षा में व्यापक स्तर पर सुधार ला सकती है। विपणन लाभ में कमी आने से तथा उपभोक्ता मूल्य में किसानों की हिस्सेदारी में बढ़ोतरी होने से बेबी कॉर्न की लाभप्रदता बढ़ने की अपार संभावनाएं हैं।
 - अन्य अध्ययन में, खेतिहर महिलाओं की सूचना एवं संचार प्रौद्योगिकियों (आईसीटी) से पहुंच और फार्म के आकार के बीच एक सकारात्मक संबंध देखा गया है। आईसीटी ने महिलाओं को अपनी खेती के उत्पादों, विशेष रूप से सब्जियों, को स्पर्धात्मक बाजार भावों पर बेचने में सहायता दी और सब्जियों के उत्पादन के लिए उन्नत प्रौद्योगिकियों को अंगीकार करने में सहजता उपलब्ध की। खेतिहर महिलाओं की आईसीटी से पहुंच को प्रभावित करने वाले अभिज्ञात किए गए महत्वपूर्ण कारणों में शिक्षा, आय, परिवार की संरचना तथा जाति सम्मिलित हैं।
 - केरल की अर्थव्यवस्था, कृषि से सेवा-उन्मुख क्षेत्र की ओर परिवर्तित हो रही है। राज्य की अपने प्रमुख खाद्य-चावल में आत्म-निर्भरता मात्र 17 प्रतिशत रह गई है और दलहनों के मामले में यह 1 प्रतिशत से भी कम है। केरल में अधिकतर खाद्य पदार्थों की मांग-आपूर्ति के भावी अनुमान की स्थिति और अधिक खराब होने की ओर संकेत दे रहे हैं (जो पहले से ही खराब है) और यदि मौजूदा स्थिति लंबे वक्त तक जारी रहती है तो खाद्य आत्म-निर्भरता के दृष्टिकोण से केरल में सबसे खराब स्तर देखे जाएंगे।
 - आईपीएम को कुल बुवाईगत क्षेत्र के लगभग 3-5% क्षेत्र में प्रभावी रूप से प्रयोग किया जाता है और जैव-कीटनाशक का प्रयोग देश के कुल जैव-कीटनाशकों की बिक्री का केवल 2.89% है। आईपीएम के लिए, बड़े स्तर पर अनुसंधान, शिक्षा, विस्तार और कार्यक्रमों (नीतियों) के समेकन पर जोर दिया जाना जरूरी है।
 - दलहन के बढ़ते उत्पादन के लिए, पादप संरक्षण तथा बीज प्रतिस्थापन दर मुख्य समस्याएं थीं। अनुसंधान की मुख्य सक्रियता देश में विभिन्न कृषि-पारिस्थितिकी तंत्र के लिए दलहन किस्मों को विकसित करने और उनका परीक्षण करने पर केन्द्रित होनी चाहिए।
- वर्ष 1901-2002 की समयावधि के लिए भारत के विभिन्न कृषि-पारिस्थितिकी तंत्र में मासिक तापमान की प्रवृत्तियों का मूल्यांकन किया गया। सामान्यतः यह पाया गया कि भारत में सर्दियों में ठंड कम हो रही है (अर्थात् सर्दियों में तापमान ज्यादा गिरता नहीं है)। अक्टूबर-अप्रैल के दौरान अधिकतर माहों में तापमान में 1° से. से 1.5° से. की वृद्धि देखी गयी, जो कि सांख्यिकीय दृष्टि से महत्वपूर्ण है।
- खरीफ मौसम के लिए, प्रत्येक जिले के लिए (1970 के आधार पर जिले) सूखा सूचकांक का निर्माण किया गया। 1970 और 1980 दशक के दौरान सूखें

- की आवृत्ति कम थी लेकिन उनके प्रभाव ज्यादा थे, जबकि 1990 और 2000 के दशक के बीच सूखें की आवृत्ति ज्यादा थी परंतु उसके प्रभाव कम थे।
- कृषि उत्पादकता पर जलवायु परिवर्तन के प्रभाव का मूल्यांकन करने के लिए वर्ष 1969–2005 की समयावधि के 200 जिलों (1970 के आधार पर) के 19 मुख्य फसलों के क्षेत्र और उत्पादन पर पैनाल डेटा का प्रयोग किया गया। अखिल भारतीय स्तर पर, तापमान में 1 डिग्री की वृद्धि से 1990 के पूर्वार्द्ध तक कृषि उत्पादकता में 12–13 प्रतिशत की कमी आती थी। लेकिन उसके पश्चात जलवायु के प्रभाव (15.5 प्रतिशत तक) बढ़ते रहे।
 - कृषि उत्पादन बढ़ाने के लिए तथा खाद्य एवं पोषणीय सुरक्षा में सुधार लाने के लिए उत्पादन में प्रौद्योगिकी का अंगीकरण तथा दक्षता में सुधार लाना महत्वपूर्ण कार्यनीतियां हैं। सभी कृषि-पारिस्थितिकी तंत्र में दक्षता में काफी विविधताएं देखी गईं। सबसे अधिक तकनीकी दक्षता पहाड़ी क्षेत्र में देखी गई, जबकि बारानी क्षेत्र में सबसे कम तकनीकी दक्षता देखी गई। तकनीकी दक्षता में सुधार लाने के लिए अध्ययन के निष्कर्षों में शिक्षा, अवसंरचना तथा संधारणीय (टिकाऊ) पूंजी परिसम्पत्तियों की सकारात्मक भूमिका को काफी महत्वपूर्ण बताया गया है।
 - सार्क देशों ने क्षेत्र में व्यापार और निवेश के उदारीकरण पर और अधिक जोर दिया है और उन्होंने जनवरी 2004 में "दक्षिण एशिया स्वतंत्र व्यापार अनुबंध" पर हस्ताक्षर किए। अंतरा-क्षेत्रीय (अर्थात् विदेशी व्यापार) व्यापार के कम मात्रा और कम अंश के लिए सीमा-शुल्क की दक्षता, अन्य सीमा कार्यप्रणालियां, परिवहन की गुणवत्ता तथा आईटी अवसंरचना इत्यादि जैसी बेहतर सुविधाओं का न होना प्रतीत होता है। खाद्य शृंखला (व्यवस्था) का विकास और खाद्य प्रसंस्करण तथा और अधिक उदारवादी व्यापार से न केवल अंतरा-क्षेत्रीय व्यापार में बढ़ोतरी होगी, बल्कि उनसे सार्क देशों में खाद्य अल्पता में भी सुधार आएगा।
 - कर्नाटक राज्य कृषि विपणन बोर्ड द्वारा मुफ्त मोबाइल एसएमएस के माध्यम से कृषक समुदाय को कृषि मूल्यों की जानकारी भेजना शुरू कर दिया गया है, जिससे न केवल किसानों के विपणन में लगने वाले समय की बचत हुई बल्कि उससे विपणन संबंधी सूचना की खोज करने में खर्च होने वाली लागत की भी बचत हुई।
 - सुपर बाजार ऐसे प्रत्यक्ष विपणन मॉडलों को अपना रहे हैं जो ग्रामीण इलाकों में सक्रिय हैं। इनके प्रयोग से किसान को बाजार जाने में खर्च होने वाली लागत, अन्य प्रभार, इत्यादि की बचत होती है तथा बिचौलियों का सफाया भी होता है। सुपर बाजारों को आपूर्ति करने से किसानों को अनेक लाभ मिलते हैं, जैसे तकनीकी मार्गदर्शन, बाजार भावों की सूचना, उत्पादन का सही वजन, नकद भुगतान आदि।
 - गरीबी और पशुधन आय के परस्पर संबंध में यह पाया गया है कि गरीबी (हेड काउंट), पशुधन तथा फसलों की आय से नकारात्मक रूप से काफी ज्यादा संबंध है। गरीबी उपशमन में पशुधन का सीमांत प्रभाव -0.36 है, जबकि फसलों के लिये -0.25 है जिससे यह स्पष्ट होता है कि गरीबी उपशमन के लिए पशुधन क्षेत्र में विकास एवं वृद्धि का व्यापक प्रभाव है।
 - भारत में भेड़, बकरी तथा सुअर जैसे पशुओं के मांस की उत्पादकता, विश्व के औसतों की तुलना में काफी कम है। डेयरी पशुओं के उत्पाद में काफी कमी आई है। संकर गायों के दूध की मात्रा में काफी कमी आई है जो 1990 के दशक में 1.8% से घटकर 2000 के दशक में 0.7% रह गई थी, जबकि भैंस के दूध की मात्रा 1.7% से घटकर 1.2% रह गई थी। पशुओं (भेड़, बकरी तथा सुअर) के मांस की उत्पादकता में काफी समय से कोई वृद्धि नहीं हुई है।
 - घरों की मांग को पूरा करने में विगत समय से सार्वजनिक वितरण प्रणाली (पीडीएस) की भूमिका बढ़ी है। सामान्य रूप से, विगत समय में पीडीएस का प्रभाव देश के अधिकतर राज्यों में बढ़ा है। अध्ययन में यह उल्लेख किया गया है कि खाद्यान्न

की कीमतों को स्थिर रखने में तथा उपभोक्ताओं को सहज कीमत पर खाद्यान्न सुलभ कराने में सरकार की पीडीएस नीति काफी कारगर साबित हुई है।

- अन्य अध्ययन में असमग्र एवं समग्र (डिसएग्रीगेट एंड एग्रीगेट) स्तर पर विभिन्न फसलों के उत्पादन में जोखिम का आकलन किया गया है। देश में शुरू की गई कृषि बीमा योजनाओं से किसानों को सीमित रूप में ही लाभ मिला है। फसल बीमा के साथ मौसम के पूर्वानुमान, कृषि सलाह इत्यादि जैसे मूल्य-संवर्धित सेवाओं को जोड़ा जा सकता है। फसल बीमा के प्रचार के लिए सरकार द्वारा 'कृषि जोखिम संरक्षण अधिनियम' आदि जैसे उपयुक्त कानून बनाने की आवश्यकता है।
- वर्ष 2004-05 से कृषि की संवृद्धि दर में काफी सुधार आया है। देश के 20 प्रमुख राज्यों में से 6 राज्यों में शुद्ध राज्य घरेलू उत्पाद (एनएसडीपी)-कृषि में संवृद्धि दर राष्ट्रीय लक्ष्य से भी अधिक थी। इन राज्यों में गुजरात, राजस्थान, छत्तीसगढ़, मध्य प्रदेश, आंध्र प्रदेश तथा झारखंड शामिल हैं। 1/5 राज्य (अर्थात् प्रत्येक पांच राज्यों में से एक राज्य) कृषि संवृद्धि दर के 4% राष्ट्रीय लक्ष्य को प्राप्त करने के काफी नजदीक हैं। 2001 से 2011 के दौरान, केरल, उत्तराखण्ड तथा जम्मू एवं कश्मीर राज्यों द्वारा कृषि क्षेत्र में 2% से भी कम संवृद्धि दर प्राप्त की गई है।
- एनएसएसओ यूनिट लेवल डेटा का प्रयोग करते हुए विभिन्न आय वर्गों के लिए अल्पपोषण (कैलोरी अल्पता) तथा कुपोषण (प्रोटीन अल्पता) के आकलन तैयार किए गए। गरीब घरों के औसत इनटेक के स्तर, एफएओ के 1800 किलो कैलोरी से भी कम थे। शहरी क्षेत्रों की तुलना में, ग्रामीण क्षेत्रों में कैलोरी अल्पता ज्यादा थी। शहरी तथा ग्रामीण दोनों क्षेत्रों में सभी मानदंडों के विकल्पों की दृष्टि से गरीब आय वर्ग की आधी आबादी में कैलोरी अल्पता पाई गई। आईसीएमआर-एनआईएन मापदंड के आधार पर, अल्पपोषण तथा कुपोषण का प्रकोप काफी ज्यादा था। आकलन में यह भी पाया गया कि ग्रामीण क्षेत्रों की तुलना में, शहरी घरों में

अपर्याप्त प्रोटीन ग्रहण करने वाली जनसंख्या का प्रतिशत अधिक था।

- ग्रामीण तथा शहरी घरों में कैलोरी के प्रतिमान तथा प्रोटीन ग्रहण की सही तस्वीर पेश नहीं करते हैं। 1983 से 2009-10 के बीच ग्रामीण क्षेत्रों में कैलोरी तथा प्रोटीन के उपयोग में कमी आई है, जबकि शहरी क्षेत्रों के मामले में स्थिति ठीक विपरीत है, अर्थात् शहरी क्षेत्रों में कैलोरी और प्रोटीन का उपयोग बढ़ा है। ग्रामीण तथा शहरी क्षेत्रों में वसा के उपयोग में विगत समय में लगातार वृद्धि हो रही है।
- 1980 के दशक में कृषि संवृद्धि का मुख्य स्रोत प्रौद्योगिकी थी। विविधीकरण (न्यून-मूल्य से उच्च-मूल्य की फसलों में) संवृद्धि (26%) का दूसरा सबसे बड़ा स्रोत था, उसके पश्चात क्षेत्र विस्तार (17%) का स्थान था। तत्पश्चात, संवृद्धि में मूल्यों में तीव्र वृद्धि (जो मुख्यतः कृषि के लिए लाभकारी थी) का भी योगदान था। दूसरी ओर, कृषि संवृद्धि में विविधीकरण ने अपने अंश को मजबूत बनाया। 2000 के दशक में कीमतों में गिरावट आई जिसके कारण कृषि संवृद्धि में कीमतों के योगदान में भारी कमी आई, जिससे यह संकेत मिला कि कीमत-आधारित संवृद्धि लंबे समय तक टिकाऊ नहीं रह सकती है।
- केन्द्र ने भारतीय अर्थशास्त्र सेवा के अधिकारियों के लिए 'कृषि क्षेत्र में मुख्य मुद्दे' पर दो एक-साप्ताहिक प्रशिक्षण कार्यक्रम आयोजित किए, जिनका वित्तपोषण वित्त मंत्रालय, भारत सरकार द्वारा किया गया था। केन्द्र ने 'दक्षिण एशिया में ग्रामीण घरों में गरीबी तथा ग्रामीण अर्थव्यवस्था में उल्लेखनीय परिवर्तन' पर आईसीएआर-आईसीआरआईएसएटी के फील्ड स्टाफ के लिए फील्ड सर्वेक्षण, इलैक्ट्रॉनिक संकलन तथा डेटा के विश्लेषण पर भी एक कार्यक्रम आयोजित किया। इसके अतिरिक्त, केन्द्र ने अनेक विषय/परियोजना-वार प्रशिक्षण, परस्पर बातचीत बैठकें, कार्यशालाएं, इत्यादि भी आयोजित कीं, जिनसे परियोजना के हिस्सेदारों के क्षमता निर्माण में सहायता मिली।



- शोध निष्कर्षों के प्रसार के लिये, केन्द्र ने प्रतिवेदित अवधि के दौरान एक नीति शोध-पत्र का प्रकाशन किया। केन्द्र के स्टॉफ ने राष्ट्रीय तथा अंतरराष्ट्रीय प्रख्याति के अग्रणी शोध पत्रिकाओं में 20 अनुसंधानिक शोधपत्र प्रकाशित किए तथा 11 पुस्तकों/चर्चित लेखों का योगदान दिया। राष्ट्रीय तथा अंतरराष्ट्रीय सम्मेलनों में 15 से भी अधिक प्रस्तुतीकरण दिए गए। केन्द्र के वैज्ञानिक अनेक पेशेवर एवं नीति परामर्शों तथा परियोजनाओं से जुड़े थे। एनकैप की वेबसाइट पुनर्बचण्णतमेण्णदद्ध का नियमित रूप से अद्यतन किया गया और केन्द्र के सभी प्रकाशनों को वेबसाइट पर अपलोड किया गया।
- केन्द्र के संकाय ने अनेक नीति संबंधी वाद-विवादों और वार्ताओं में सहभागिता की और पॉलसी एडवोकेसी आधारित अनुसंधान पर भी कार्य किया। एनकैप के संकाय ने जनता में विभिन्न कृषि संबंधी मुद्दों पर टी.वी. वाद-विवाद तथा समाचार-पत्र की रिपोर्टिंग में सहभागिता के माध्यम से उचित ज्ञान एवं जागरूकता के सृजन में अहम भूमिका निभाई है। कृषि एवं सहकारिता विभाग (डीएसी), वित्त मंत्रालय तथा वाणिज्य मंत्रालय की आवश्यकताओं के प्रति प्रतिक्रियाशील रहने के अलावा, केन्द्र के निदेशक ने सार्क, जी-20 तथा दो अन्य अंतरराष्ट्रीय निकायों के लिए बहुत महत्वपूर्ण भूमिका निभाई है।



I. PROFILE OF NCAP

The National Centre for Agricultural Economics and Policy Research (NCAP) was established to strengthen agricultural economics and policy research in the National Agricultural Research System (NARS) of the country. The Centre acts as eyes and ears of the Council and helps the ICAR through credible research to actively participate in policy dialogues and decision making. It serves as the nodal agency of the ICAR in monitoring and interpreting the research implications of changes at grassroots level, and macroeconomic environments at national and international levels.

Location

The Centre is located in the Pusa campus in New Delhi. It has in its close vicinity several institutes of ICAR and of other organisations; these include Indian Agricultural Research Institute (IARI), Indian Agricultural Statistics Research Institute (IASRI), National Physical Laboratory (NPL), National Institute of Science, Technology and Development Studies (NISTADS), National Institute of Science, Communication and Information Resources (NISCAIR), Institute of Hotel Management, Catering and Nutrition, etc. The Centre is very close to the National Agricultural Science Centre (NASC) Complex which houses National Academy of Agricultural Sciences (NAAS), regional offices of nine Consultative Groups of International Agricultural Research (CGIAR) Centres and offices of many professional societies. The Centre, thus has the locational advantage in terms of multidisciplinary studies, inter-institutional interactions and research linkages, library facilities, etc.

Vision

Leveraging innovations for attaining efficient, inclusive and eco-friendly agricultural growth through agricultural economics and policy research.

Mission

To strengthen agricultural economics and policy research for providing economically-viable, socially-acceptable and environmentally-feasible policy options for science-led agricultural growth.

Mandate

The mandate of the Centre is:

- 1 To conduct policy-oriented research in network mode on:
 - (a) Technology generation, diffusion and impact assessment,
 - (b) Sustainable agricultural production systems,
 - (c) Interaction between technology and other policy instruments like incentives, investments, institutions and trade, and
 - (d) Agricultural growth and modelling with focus on role of technology;
- 2 To strengthen agricultural economics and policy research in the NARS; and
- 3 To enhance participation of ICAR in agricultural policy debates and decisions through policy-oriented research and professional interactions.

Research Activities

Research activities of NCAP are broadly covered under the following five major themes:

- Technology policy
- Sustainable agricultural systems
- Markets and trade
- Institutional change
- Agricultural growth and modelling

As a part of policy advocacy, the Centre organises workshops and participates actively in policy interactions where issues of major policy interests are discussed by the policymakers, academicians, etc. The Centre also organises lectures of distinguished scholars and policymakers for a deeper understanding of the global developments and policy changes. Trainings and capacity building in frontier areas of agricultural economics are accorded high priorities by the Centre.

The Centre maintains close linkages with several national and international organisations involved in agricultural research, development and policy issues. Collaborative research projects, seminars, workshops, publications and participations in policymaking bodies are the usual modes of policy interface which help improve the outreach of the Centre. The Centre regularly brings out publications like Policy Papers, Policy Briefs, Conference Proceedings, and PME Notes, besides publishing in journals. These serve as the main agents for dissemination of its research findings.

Management

A Research Advisory Committee (RAC) comprising eminent professionals, mostly from outside the ICAR system, guides the Centre on its research activities. Prof. V S Vyas, Member, Prime Minister's Economic Advisory Council, is the Chair of present RAC. The functioning of the Centre is supervised by a Management Committee (MC), which is constituted and mandated by the ICAR. Besides, a number of internal committees and cells, including those mandated by ICAR, are

operating for an efficient and decentralised management of the Centre. The Joint Staff Council (JSC) promotes healthy interaction and congenial work environment at the Centre. Director conducts regular meetings with staff, mostly every month, to discuss problems and difficulties, if any, faced by the staff and to elicit their suggestions for the cordial functioning of the Centre. The organogram of the Centre is illustrated in Figure 1.

The achievements and functioning of the Centre are evaluated by the Quinquennial Review Team (QRT), constituted by ICAR. The last QRT for the evaluation of Centre for the period 2006-2010 was chaired by Dr. S. S. Acharya, Hon. Professor, Institute of Development Studies, Jaipur. The Team submitted its report to the Council in January 2012.

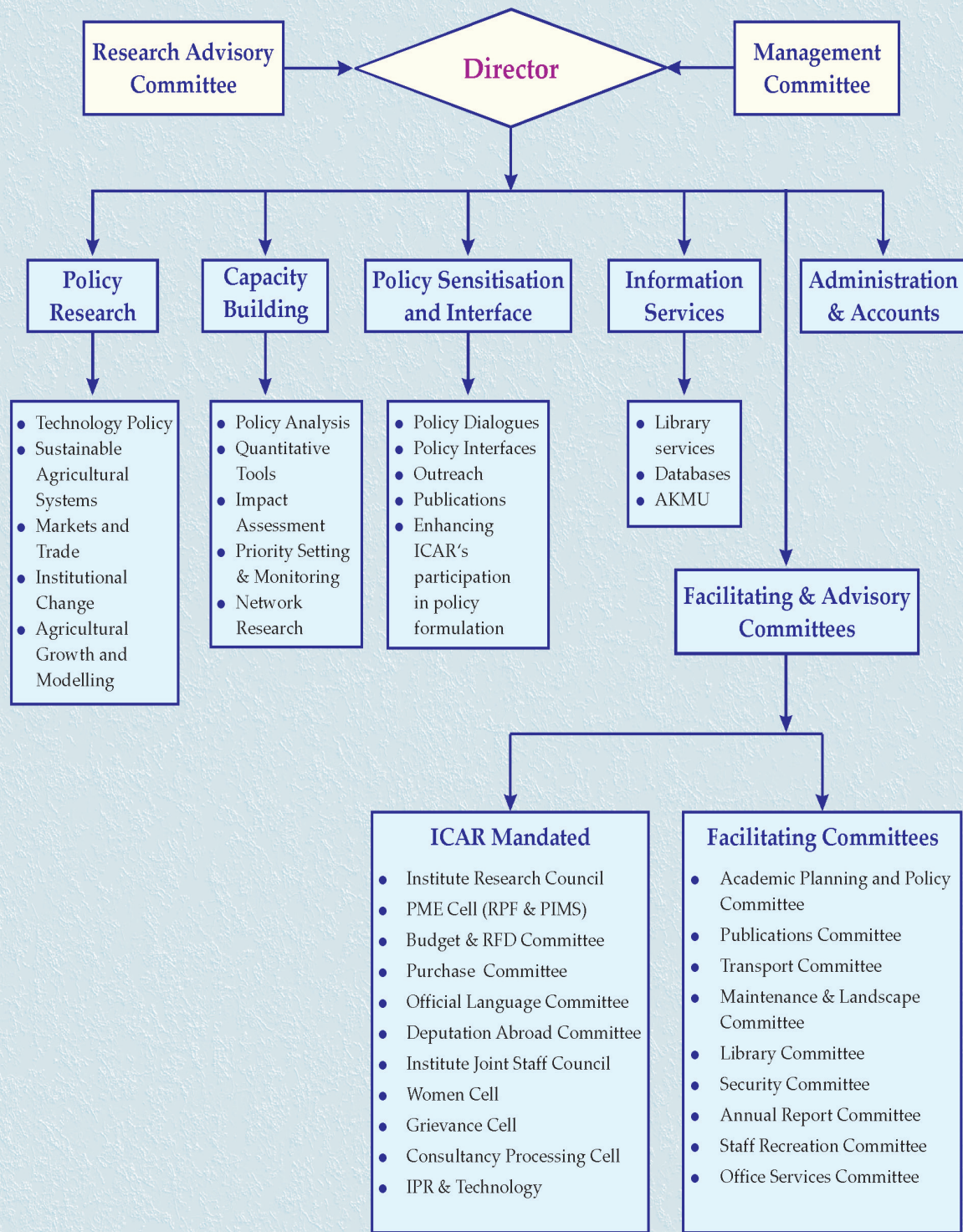
Infrastructural Facilities

NCAP Website

NCAP publishes all important information about activities of the Centre, particularly about its staff, infrastructure, research projects, publications and linkages on its Website (<http://www.ncap.res.in>). The Centre's website is hosted through ERNET, New Delhi and is being updated at regular intervals. All NCAP publications like policy papers, policy briefs, working papers, PME notes, workshop proceedings, etc. have been uploaded on the website and are available in the form of PDF files. Among the publications, workshop proceedings, policy papers and policy briefs were the most referred one. NCAP website was regularly updated in terms of data as well as coding in the year 2011-12. The website is updated regularly.

During the year, traffic to NCAP website increased significantly. Weblog data revealed that NCAP site is viewed much more in USA than in India. The visitors from USA were more

Figure 1: Organogram of NCAP



than double the visitors from India during the year 2012 (Figure 2). About 80 per cent of the visitors who accessed NCAP website were from USA (56.1%) and India (24.59 %). Centre's website was also accessed in Australia (3.99%), France (3.89%), and other countries (9.4%). Overall, the website was accessed by users of 150 countries. Measure of some important performance parameters of the NCAP website like average sessions per day, average hit per day, average number of pages viewed, average sessions per IP address, average time spent per session are presented in Table 1.

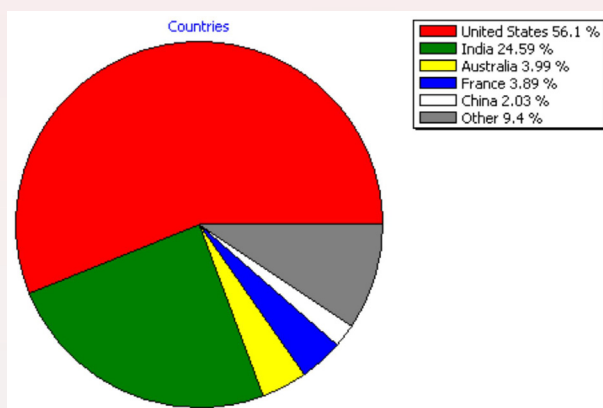


Figure 2: Distribution of website visitors across major countries in the world

Table 1: Some performance parameters of NCAP website

Parameter	Value
Average number of sessions per day (No.)	551
Average number of hits per day (No.)	4900
Average number of different pages viewed per session (No.)	1.47
Average number of sessions per IP address (No.)	2.03
Average number of visitors at one moment (No.)	1.49
Average time spent per session in seconds	233

Agricultural Knowledge Management Unit

Quick access to information at global level through electronic media has opened new options to tackle future challenges of Indian

Agriculture in an effective and efficient way. The newly constituted Agricultural Knowledge Management Unit (AKMU), based on erstwhile Agricultural Research Information System (ARIS), serves this useful purpose. The goal of the AKMU is to strengthen information management using modern technologies within the NARS. The major objectives are:

- To put information close to managers and scientists
- To build capacity to organise, store, retrieve and use the relevant information
- To share the information over NARS using NCAP website
- To improve the capacity to plan, execute, monitor and evaluate research programmes

To attain these objectives, the AKMU at NCAP is well equipped with latest computers, servers, firewall (Fortigate 80c), centralised antivirus server and analytical software like SPSS 20, STATA 12, LIMDEP 9.0, GIS, GAMS, Stella and SAS 9.3. For data management and in-house software development, SQL server 2008 and Visual Studio facilities have been installed. Online data bases (of CMIE data and other reputed data banks) are accessible through LAN. Each individual staff member has been provided with the latest computer and software, LAN, email account, internet facilities and required computational facilities. AKMU has been instrumental in providing access to NCAP researchers to various publications throughout globe via email system. During the year, a leased line has been installed for backup and 14 new workstations have been installed for scientists.

Library

NCAP library has a collection of print, electronic databases like Statistical Abstracts, Economic Survey, Agricultural Census, Input Surveys, Livestock Census, NSSO CD ROM, and CSO and other Government of India

publications and some state Government publications. The library facility of Centre is being developed as an efficient information service unit. At present library houses a total of 6518 publications, 3227 reference books, 118 CD ROMs, 2295 database publications, 781 reports, 97 SAARC publications and other references materials. Library references are computerized using library software package with quick search facility. The library has subscription to 16 national journals, 11 international journals and online subscription to Centre for Monitoring Indian Economy Pvt. Ltd. (CMIE) database Business Beacon, and Economic Intelligence Service; and Economic & Political Weekly (EPW) archives and Economic and Political Weekly Research Foundation (Indian Times Series). It also has a repository of FAO, CGPRT, and CGIAR reports. Library has separate section of Hindi books. NCAP Researchers have access to many journals through CeRA (Consortium for e-Resources in Agriculture) website created by IARI under NAIP project.

The library is playing active role in timely dissemination of scientific and technical

information for research via Current Awareness Service and Newspaper Clipping Service also. Further three computers; one printer and one scanner are placed in library with connectivity to internet for library user's convenience.

Record Room

It has been observed and recommended by the QRT that a facility like record room should be created. Record room should display NCAP achievements since beginning. Accordingly, the Record room facility has been created at the centre. It showcases research and other achievements and activities of NCAP. Record room displays all NCAP publications, annual reports, publications of individual scientists, recognitions and awards received by the Centre and by individual scientists. A photo gallery displays memories of all important events organised by the Centre.

Budget

The expenditure of NCAP for the year 2012-2013 is presented in Table 2 and its staff position is depicted in Table 3.

Table 2: Expenditure during 2012-13

(in lakh Rs)

Head of Account	Plan	Non-Plan	Total
Pay and allowances	-	295.92	295.92
Over time allowance (OTA)	-	0.15	0.15
Travelling expenses	5.91	1.00	6.91
Works	-	-	-
Other charges including equipment	120.59	5.86	126.45
Human resource development (HRD)	5.50	-	5.50
Library	8.00	-	8.00
Pension/Retirement benefits	-	24.96	24.96
Loans & Advances	-	4.38	4.38
Sub-Total	140.00	332.27	472.27
National Agricultural Innovation Projects	3.35	-	3.35
Other projects	20.98	176.23	197.21
Grand Total	164.33	508.50	672.83

Table 3: Staff position during 2012-13

Sl. No.	Name of the Post	Sanctioned	Filled	Vacant
1.	Director	1	1	-
2.	Principal Scientist	6	4	2
3.	Senior Scientist	6	4	2
4.	Scientist	13	12	1
5.	Technical (T 6-8)	4	4	-
6.	Technical (T 4)	1	1	-
7.	Administrative Officer	1	1	-
8.	Assistant Administrative Officer	1	1	-
9.	Assistant Finance & Accounts Officer	1	1	-
10.	Private Secretary	1	1	-
11.	Assistant	4	4	-
12.	Stenographer	1	1	-
13.	Upper Division Clerk	1	-	1
14.	Lower Division Clerk	2	2	-
15.	Skilled Supporting Staff	2	2	-

II. RESEARCH ACHIEVEMENTS

Technology Policy

Priorities for Agricultural Research in India

Sant Kumar, Mywish K. Maredia and Sonia Chauhan

Limited availability of resources for agricultural research calls for a judicious allocation of resources across regions. This study compares existing and normative allocation of agricultural research resources across major states of the country. Normative allocation was worked out based on the framework of efficiency, equity, and sustainability. Modified scoring approach was applied to the data pertaining to triennium ending (TE) 2008-09 across states.

The existing and optimal shares of states in all India research resources based on chosen

criteria are presented in Box 1. The results suggest increase in share of Uttar Pradesh, Madhya Pradesh, Rajasthan, Bihar, West Bengal, Odisha, Chhattisgarh and Jharkhand in total research resources. The proposed reallocation of resources shows large reduction in shares of Maharashtra, Tamil Nadu, Punjab, Haryana, Kerala, Andhra Pradesh, Gujarat, Karnataka, Assam, and all hill states to varying degree.

Interestingly, the states which gain in proposed allocation, except West Bengal, are in the development stage of agriculture. The implication of the results is that long-term social and environmental goals are important in deciding research priorities including increasing efficiency. Ignoring such goals in allocation of research resources for agriculture will intensify regional disparities further.

Box 1: States classified based on existing and normative allocation of resources

States requiring more than existing allocation			States requiring more than proposed allocation		
State	Existing share	Proposed share	State	Existing share	Proposed share
Uttar Pradesh	10.10	13.20	Maharashtra	12.56	9.96
Madhya Pradesh	2.21	6.59	Andhra Pradesh	9.30	7.99
Rajasthan	2.92	6.58	Tamil Nadu	9.18	5.52
Bihar	3.50	6.28	Gujarat	7.42	6.11
West Bengal	2.75	4.78	Karnataka	6.21	5.41
Odisha	1.92	3.38	Jammu & Kashmir	5.79	2.14
Chhattisgarh	0.79	2.55	Haryana	4.76	3.06
Jharkhand	1.50	2.34	Punjab	4.73	3.83
			Kerala	4.11	2.46
			Assam	3.00	2.38
			Himachal Pradesh	2.41	1.16
			Uttarakhand	2.34	1.41

District Level Agricultural Productivity and Its Determinants

Anjani Kumar and Rajni Jain

The district wise agricultural productivity was estimated for TE 1991-92, 2001-02 and 2007-08 at constant prices. The striking variations were observed across districts. Per hectare crop productivity varied from only Rs 1478/ha in Barmer district of Rajasthan to Rs. 93936/ha in Tanjavur district of Tamil Nadu in TE 1991. In 2001 the lowest productivity was Rs. 2088 in Barmer district of Rajasthan and the highest productivity was Rs. 93771/ha in Karnal district of Haryana. Barmer remained the lowest productive district in TE 2007 with Rs. 2068/ha and Karnal recorded the highest productivity of Rs. 107376/ha.

Determinants of productivity

Agricultural productivity is influenced by a large number of socio-economic and bio-physical factors. The cross-sectional (district wise) and time-series double log regression model was used to test whether increased use of land, labour, fertilizers, tractors, institutional credit, irrigation and intensive use of land leads to higher agricultural productivity. The impact of weather condition on agricultural productivity is also assessed. The sign and magnitude of coefficients are on expected line (Table 6). The elasticity of cropping intensity was on higher side (1.17), followed by fertilizer usage (0.29), irrigation (0.20), literacy (0.19), rainfall (0.17), road density (0.11) and credit (0.0003).

With one per cent increase in fertilizer usage, the agricultural productivity would increase by 0.29 per cent. Along with fertilizer, irrigation, source of irrigation, better human resources, road connectivity and good rainfall have emerged as the critical determinants for agricultural productivity. Coefficient of pump sets represents the quality and assurance of

Table 6: Determinants of agricultural productivity

Explanatory variable	Coefficient	Std. Error
Cropping Intensity	1.175211***	0.1182855
Fertilizer use	0.2920946***	0.026719
Irrigation	0.196151***	0.325344
Literacy	0.1922321**	0.0801767
Rural labour	-0.1254301***	0.0321797
Tubewell	0.0758167***	0.0164413
Road	0.1098106***	0.0290127
Credit	0.0000031**	0.00000152
Rainfall	0.1677093***	0.032143
Constant	0.434599	0.6119717
R ²	0.7114	

Note: *** and ** indicate significance at 1 per cent and 5 per cent level of productivity respectively

irrigation and positively influences agricultural productivity. The role of agricultural credit, though significant, was not observed to be explicitly visible. It could be attributed to the fact that the access to institutional credit is reflected in other variables like adoption of improved seeds, increased use of fertilizer and irrigation. The study stressed on the need for greater investment on infrastructural development and intensification of use of modern inputs for enhancing the agricultural productivity in the country.

Is the Agricultural R&D of Third World Country Heading for a Technological Orphanage?

G. K. Chadha and P. Ramasundaram

The main objective of the study was to throw bare the technological infirmities of the developing world agriculture, and to caution the international development organizations as also the policy makers in the developing world itself that agricultural R&D should be an area of top priority if the threatening prospects of severe food deficits, hunger and malnutrition are to be mollified, if not eradicated. The

specific objectives are to assess (i) agricultural R&D in relation to overall R&D and domestic GDP; (ii) agricultural R&D in public and private sectors; and (iii) agricultural R&D in relation to total rural population or population dependent on agriculture.

The developed world commands extreme dominance in terms of R&D expenditure. USA alone has one-third share of world R&D expenditure, against only 4.6 per cent share of world population. In 2012, USA spent 2.8 per cent of its GDP on general R&D while it is only 0.8 per cent for India. While the developing countries continued to bank upon public investment for their agricultural R&D, their public expenditure on R&D as proportion of agricultural GDP has been hovering around 0.52 per cent during 1981-2000. In the developed world, public investment started taking a back seat and the private investment now dominates agricultural R&D. Developed countries was 1.4 per cent in 1981 and went to 2.4 per cent in 2000. Four big developing countries (China, India, Brazil and South Africa) accounted for almost 50 per cent of the developing world's public agricultural investment in 2000, up from 37 per cent in 1981. Inter-country technology gaps are bound to magnify and push a big majority of the developing countries to the brink of technological orphanage.

Public expenditure on R&D as a proportion of agricultural GDP has been hovering around 0.52 per cent during 1981-2000, for the developing countries, while for the developed countries it registered a noticeable mark-up, from 1.4 per cent in 1981 to 2.4 per cent in 2000 for the developed world. In the former camp, India showed a noticeable improvement from 0.18 per cent in 1981 to 0.34 per cent in 2000, while in the latter, it increased from 1.31 per cent to 2.60 per cent in USA and from 1.45 per cent to 3.62 per cent in Japan. It discerns

that in the developing world as a whole, a rather negligible proportion of what is being produced in agriculture is ploughed back into R&D activities through public investment, and accordingly, with every passing decade, the developed world is leaving the developing world much behind in terms of this measure of investment.

Agricultural R&D is largely a public sector concern in developing world; in 2000, no less than 92 per cent of total R&D expenditure came through government spending vis-à-vis 45 in developed world. Private investment in agricultural R&D is overwhelmingly located in the developed world. This has the potential of creating a big dichotomy between the needs of millions of smallholders, and other marginalized sections in rural areas of the developing countries, and the business interests of a few global corporate players. The study concludes that agricultural R&D for less-developed countries is at crossroads. The technology gap between the developed and the developing countries is increasing, both quantitatively as well as qualitatively. If the current R&D dichotomies continue, it may dispatch agriculture in many developing countries to technological orphanage.

Assessing the Adoption of Modern Varieties of Chickpea (*Cicerarietinum L.*) in Madhya Pradesh (Funded By SPIA-FAO)

Ramesh Chand, P. S. BIRTHAL, Usha Rani Ahuja, P. Ramasundaram, Sajesh V. K. and Khyali Ram

The study has examined the varietal diversity and identified dominant varieties of chickpea in Indian state of Madhya Pradesh, having largest chickpea area and production in the country. A field survey of 1000 chickpea farmers and 50 traders/millers was conducted across six districts of M.P. Chick pea occupied 63.22 per cent of the net sown area at sample

households, indicating the dominance of the crop in the farm economy. One-third of the farms' chickpea area was under Kabuli type chickpea, mainly concentrated in the Western region (Malwa Plateau) of Madhya Pradesh (Shajapur and Ujjain districts). Within Kabuli, 'dollar', a non-descript cultivar occupied 70 per cent of the area. It is believed to be a Mexican cultivar introduced by traders and is not recommended by State Department for cultivation. But it is highly popular because of the export potential and the premium price it commands. The other three districts were characterized by non-kabuli type and the variety JG315 alone accounted for more than 46 per cent of the net sown area. Two-third of the chick pea area was under non-Kabuli mainly concentrated in Vindhyaachal and Keymore Plateau regions. JG 315 variety occupied 72 per cent of the non-kabuli area and 48 per cent of the crop area. The next major variety was JG 335. JG315 has the highest yield of 14.70 q/ha followed by JG322 with 13.50 q/ha. The most preferred traits were size and colour of the gram, duration, drought resistance and taste. Lack of availability of seeds of modern varieties is one of the main constraints to their adoption. Most of the farmers use home-saved own seeds. The crop is susceptible to many insect pests and diseases; the most important being fusarium wilt and *Helicoverpaarmigera*.

Mobile Telephony in Agriculture: A Case Study of Agriculturally Backward and Developed Areas of Haryana State

Usha Rani Ahuja, Rajni Jain, Sonia Chauhan, Amarjeet Singh, Prem Narayan and Khyali Ram

The study examined the use and perceived impact of mobile phone use among different farm size holders in two distinct districts of Haryana, namely Karnal representing agriculturally developed and Mewat representing agriculturally backward district.

The study was based on 60 farmers from each district and concluded that about three fourth of the farmers were using their mobile phones for arranging agricultural inputs, getting market information, monitoring financial transactions and consulting experts during agriculture emergency situations. Use of mobile phones has benefitted farmers by saving the time and money for the coordination of different agricultural operations and saved 96 per cent transaction costs. Factors affecting use of mobile are size of holdings, family size, and cropping pattern (diversification). All these factors have positive relationship with use of mobiles phone in both the districts. Use of appropriate information and inputs at required time has brought more efficient ways of production and sale of produce. Much useful and economical services like SMS alert, agri-alert and SMS communication were not used by most of the farmers due to lack of awareness and hesitation to use. To harness the full potential of mobile and to pave the way for m-agriculture (Mobile based agriculture), awareness cum training programs need to be organized to encourage farmers in accessing information on weather and agricultural technologies. Mobile applications in agriculture using local languages will be highly beneficial.

Impact of Baby Corn Production on Income and Employment in Mewat

Usha Rani Ahuja, Prem Narayan, Naina Mittal and Amarjeet Singh

A study was conducted to see the impact of baby corn production on the improvement of livelihood security of the rural farm families (36) in 8 villages of Mewat district. Comparative cost-return structure of baby corn with respect to other crops revealed that baby corn cultivation can improve the livelihood security of the farm families to a

great extent by providing net returns of Rs 68,725/acre. The second remunerative crop is tomato; its cultivation yielded net returns of Rs 24751/acre. Traditional crops like wheat, mustard, jowar and bajra generated less than Rs 15000/acre income. Maximum B/C ratio of 2.36 was in case of baby corn followed by mustard (2.00), jowar (1.79), wheat (1.02), tomato (0.98) and bajra (0.66). Sample farmers were selling baby corn at Rs 27/Kg which is very low compared to retail price. Reduction in marketing margin and increase in share of farmers in consumer price has the scope to raise profitability of baby corn manifolds. This requires linking of farmers with the markets to promote diversification towards baby corn and new high value crops in this area. Findings further provide insights that being one of the most labour intensive crops, it generates additional employment of 40 to 50 man days as compared to conventional crops like wheat, mustard, jowar and bajra.

ICTs and Farm Women: Access, Use and Impact

Rajni Jain, Usha Rani Ahuja and Anjani Kumar

A study was carried out in Sonapat district of Haryana to assess the status of access to information and communication technologies (ICTs) and identify its usage pattern among farm women. The results reveal positive relationship between access of farm women to ICTs and farm size. Access to more modern ICTs tools like phones, mobiles and computers was relatively lesser. Nearly one-fourth of the women farmers used radio, TV and phones on daily basis. ICTs had helped farm women in selling their farm produce especially vegetables at current market rates and facilitated adoption of improved technologies for vegetables production. The important drivers identified affecting farm women's access to ICTs are: education, income, structure of the family and caste.

Development Priorities for Agricultural and Livestock Sector in Kerala

Shinoj Parappurathu

The primary objective of the study was to provide insights for shaping up a roadmap for future development of Kerala's agricultural sector, with special emphasis on crops and livestock. It forms a part of the Kerala Perspective Plan 2030, which the Government of Kerala plans to take up for developing the state in the forthcoming two decades. The study concludes that Kerala's economy is transforming from an agrarian one to a heavily service oriented one.

The employment profile of Kerala's workforce is increasingly getting tilted away from agriculture towards more remunerative alternatives. The share of agricultural and allied activities towards Kerala's domestic output is declining at fast rate. The concern that, the state is losing out its economies of scale in farming due to fragmentation of land and decreasing farm size is getting more and more obvious. Along with a reduction in net cropped area, there has also been a growing trend of the farmers to move away from staple food crops to commercial crops like rubber. The declining productivity in crops like pepper, cashew nut, tea, coffee, etc. and the growth in value of output from livestock is also a cause of concern in Kerala. However, the goat and poultry population have shown an improvement during the recent past.

An increasing preference of consumers for high value commodities over traditional commodities in Kerala is observed. Based on the baseline estimates of demand and supply of major food commodities, Kerala's present level of self-sufficiency in food was assessed (Figure 3). Kerala is highly dependent on external sources for essential food. The level of self-sufficiency of the state on its staple food,

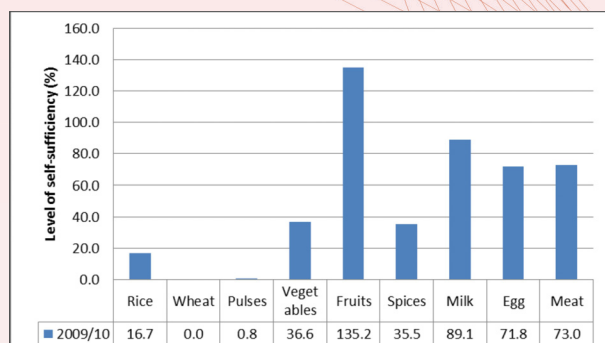


Figure 3: Level of self-sufficiency (per cent) for major food items in Kerala, 2009/10

rice was found to be just 17 per cent, whereas that on pulses was less than 1 per cent. Similarly, the external dependence on vegetables, spices, livestock products like milk, meat, egg, etc., was also evident. It was only in the case of fruits, that Kerala produced more than it consumed. The future projections on supply-demand balance of most of the food commodities indicate further aggravation of the already well articulated concern of Kerala touching the worst levels of food self-sufficiency, if existing trends continue for long.

The future of Kerala agriculture would depend considerably on how the scarce resources of the state are put into best use and the way in which a judicious balance between the competing sectors is achieved.

Development Policy and S&T: Research Policy for Indian Agriculture

Rajeswari Raina and P. Ramasundaram

A study was carried out with the intent to understand the relationship between agricultural development policy and agricultural science and technology (S&T). Two cases viz., Integrated Pest Management and Pulses production in two states (Andhra Pradesh and Madhya Pradesh) have been selected purposively for policy analysis. A policy change framework has been used to analyze the content and changes in initial

problem context, possible policy goals and choice of policy instruments. Both IPM and pulse production were initially researched in the 1960s, formulated in the 1970s within the S&T system as solutions to perceived problems in the sector; and both entered the Five Year Plans and production programmes or schemes starting with the Fourth Plan (1969-74). As a policy issue, IPM is articulated as a solution to a problem (increasing chemical use in crop production and declining effectiveness of chemicals to control the increasing incidence of pests), whereas pulse production is a problem (stagnant production and yield, reducing availability in the national food basket and for the poor in particular, and increasing imports to meet the demand). In policy parlance, the IPM problem is one of improving IPM knowledge and its application in a context where chemical control of pests and diseases is part of the accepted technological and administrative support for production. The research system now articulates how the effectiveness of IPM in the country needs to be enhanced. IPM is effectively used in about 3-5 % of net sown area and biopesticides accounting for only 2.89 % of the pesticides sales in the country. Greater integration of research, education, extension and programs (policies) for IPM is emphasized.

S&T for pulses is most evident with the AICPIP (1966), its evolution to a Directorate of Pulse Research (DPR, 1984) and the Indian Institute of Pulse Research (IIPR, 1993) – marking a gradual gain in the hierarchy of research organizations in the ICAR-DARE system. Along with this, the AICPIP was trifurcated into CRPs for chickpea, pigeonpea and MULLaRP (mungbean, urdbean, lentil, lathyrus, rajmash and field pea) to give specific research attention to each pulse crop. Plant protection and seed replacement rates were identified as the major constraints to increasing pulse production. The major research activity

is to develop and test pulse varieties suitable for different agro-ecosystems in the country.

Sustainable Agricultural Systems

Long-term trends in temperature and rainfall in India

Ranjit Paul, P. S. BIRTHAL, A. Suresh and Shiv Kumar

Trends in the monthly temperature in different agro-ecologies of India were assessed for the period 1901-2002 applying Mann-Kendall trend test along with deterministic linear trend for robustness check. In general, it emerged that Indian winters are becoming hotter. There was a statistically significant rise (1°C to 1.5 °C) in the temperature in most of the months during October-April. In the humid zone, there was significant rise in temperature during January-March and then October-December. In the semi-arid tropics, the temperature experienced a rise during January-April and then during September-December. February, April, November and December were found to be hotter in the arid zone. In the semi-arid temperate zone also, there was a significant rise in temperature in February, November and December, while September

experienced a statistically significant decline in temperature. However, we did not find any significant trend in the annual rainfall in any of the zone, except in the arid zone, that witnessed a rise in rainfall.

Frequency of droughts

P. S. BIRTHAL, D. S. Negi, Shaily Agarwal and Md. Tajuddin

Besides a gradual change in temperature and rainfall, climate changes sometimes exhibit themselves as extreme events that may cause damage to agricultural and household economies than the gradual changes in temperature and rainfall. To identify these extreme events, we constructed a drought index (DI) for each district (1970 base districts) for the kharif season. The index is defined as the product of standardized deviations of average growing season, temperature and rainfall.

The index takes into account the excessive temperature (above normal) and scant rainfall (below normal) to define a situation of drought in a district. Figure 4 plots distribution of districts (in per cent) that were affected by drought (as defined by the DI) during the last four decades or so. During the 1970s and 1980s

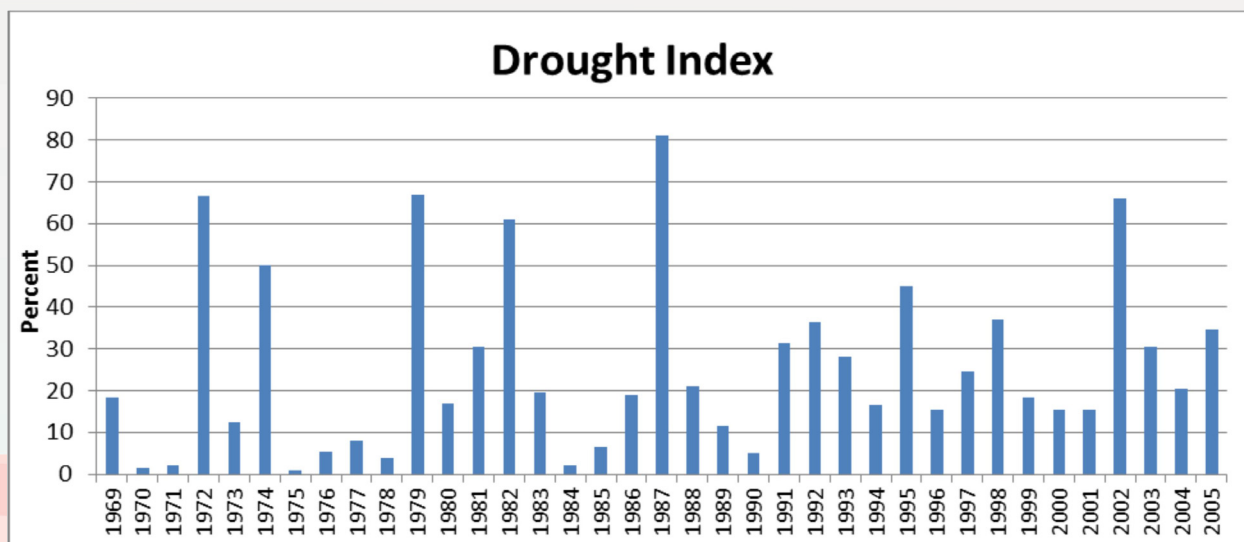


Figure 4: Distribution of districts as per the drought index (%)

droughts were less frequent but were more widespread. These, however, became more frequent during the 1990s and 2000s, but less widespread.

Impact of climate change on agricultural productivity

P. S. BIRTHAL, D. S. NEGI, SHIV KUMAR, A. SURESH AND SHAILY AGARWAL

Panel data on area and production of 19 major crops for 200 districts (at 1970 base) for the period 1969-2005 were used to assess the impact of climate change on agricultural productivity. The value of output was estimated at farm harvest price (at 2004-05 base level). To avoid nonlinearities while estimating impact of temperature on gross productivity, the entire period was divided in three sub-periods, viz. 1969-1980, 1981-1992 and 1993-2005.

The impact of rise in temperature by 1 degree on gross productivity in different agro climatic zones is shown in Table 7. At all India level, 1 degree rise in temperature could cause a reduction in agricultural productivity by 12-13 per cent until the early 1990s. The effect, however, became stronger (15.5%) afterwards.

infrastructure and other adaptation strategies. Humid region is also likely to escape the severe brunt of climate change.

Technical Efficiency in Agricultural Production in India: An Analysis at the District level using Non-Parametric Approach

A. Suresh

Technology adoption and improvement in efficiency in production are important strategies to raise agricultural production and to improve food and nutritional security. Efficiency assumes much greater significance. Since natural resource base consisting of land and water is under serious strain, the only way to maintain positive growth in output without increasing strain on natural resources is to produce more output per unit of all the inputs.

The study estimated the technical efficiency (TECHEF) of agricultural production in India considering districts as the decision making units (DMUs) and decomposed the technical efficiency into its components- viz. pure technical efficiency and scale efficiency, using Data Envelopment Analysis (DEA). The technical efficiency was estimated using

Table 7: Impact of one degree increase in temperature on gross return per hectare (%)

Agro-climatic zones	1969-1980	1981-1992	1993-2005
All-India	-12.39	-12.67	-15.49
Arid zone	-14.32	-17.58	-29.90
Humid zone	-7.53	-4.63	-10.02
Semi-arid temperate zone	-17.01	-1.49	-0.20
Semi-arid tropics zone	-19.61	-22.36	-25.02

Agriculture in the arid zone and semi-arid tropical zones is more vulnerable to climate change, and its effects have become stronger over time. In the semi-arid temperate zone, its impact is the least, particularly after 1970s, probably because of developments in irrigation

constant return to scale (CRS) and variable returns to scale (VRS) assumptions. In the second stage, the study identifies the major factors that determine the TECHEF by regressing the efficiency estimates with a set of explanatory variables. The estimation was

done using data pertaining to 409 districts, spanning across all the five agro-ecologies. The output variable was district level crop productivity per hectare and the input variables were rainfall, fertilizer application, irrigation and worker available per hectare of net cropped area. The overall average TECHEF was 42 per cent, with a pure technical efficiency level of 54 per cent and scale efficiency of 78 per cent, indicating existence of substantial inefficiencies (Table 8). The study revealed large variation of the efficiency across agro-ecologies. The highest

TECHEF was observed in case of hill and mountainous region and the lowest in the case of rainfed region. The pure technical efficiencies in irrigated and rainfed regions were comparable, highlighting the scope to improve the agricultural production by manipulating the efficiency enabling conditions, even in resource endowed regions.

The determinants of the district level efficiencies were identified using DEA analysis are given in Table 9. The findings of study

Table 8: Mean and standard deviation (SD) of the efficiency estimates

Agro-ecology	CRS		VRS		Scale	
	Mean	SD	Mean	SD	Mean	SD
Arid	0.44	0.26	0.75	0.23	0.58	0.24
Coastal	0.52	0.26	0.57	0.24	0.89	0.11
Hill and mountainous	0.64	0.28	0.74	0.24	0.87	0.20
Irrigated	0.45	0.26	0.50	0.24	0.85	0.13
Rainfed	0.37	0.16	0.52	0.16	0.71	0.17
Overall	0.42	0.23	0.54	0.21	0.78	0.18

Table 9: The Tobit estimates of determinants of efficiency

	VRS	CRS	Scale
Constant	0.33811***	0.69799***	0.53002***
Average size of holding (ha)	-0.00002	0.00001	0.00001
Land degradation (%)	-0.00263***	-0.00246***	-0.00098**
Livestock per hectare of net sown area	0.00022	0.00021	0.00009
Road density	0.00006*	-0.00001	0.00010***
Tractor density (no/)	0.00197***	0.00076	0.00218***
Rural female literacy (%)	0.00416***	0.00397***	0.00151**
Area under high value crops (%)	0.00026*	0.00023	0.00008
Agro-ecology dummies			
Coastal	-0.06012	-0.35570***	0.27199***
Hill and mountainous	0.11658*	-0.12699*	0.28888***
Irrigated	-0.03419	-0.29034***	0.22469***
Rainfed	-0.11325**	-0.30763***	0.11373***
No of observations	409	409	
Log likelihood function	91.84	66.62	

***, ** and * indicate probabilities at 1, 5 and 10 per cent levels, respectively.

reveal significant positive role of education, infrastructure and durable capital assets in improving the TECHEF. One noteworthy feature is the introduction of agro-ecosystem health, captured through land degradation, as a major determinant. This variable exerted significant negative impact on the TECHEF. The study reveals significant influence of agro-ecologies on technical efficiency, highlighting the need to develop region-specific strategies for efficiency improvement and infers the importance of decentralised agro-ecological regional planning for agricultural development. Given the public and private goods characteristics, it calls for both private and public investment to conserve the land quality and ameliorate already degraded land.

Markets and Trade

International Trade, Regional Integration and Food Security in South Asia with Special Focus on LDCs

Ramesh Chand

Dietary energy intake in all South Asian countries has remained lower than not only the world average but also the average of developing countries. Further, this gap in

dietary intake of energy based on FAO norm of 1800 KCL has increased during 1990-1992 and 2006-2008, for India, Bangladesh, Nepal and Pakistan. Though all South Asian countries have experienced some improvement in per capita energy intake the increase has been very small, in the range of 3 to 16 per cent over a period of 16 years (Table 10).

Prevalence of under nutrition during 2006-2008 varies from 17 per cent (in Nepal) to 26 per cent (in Bangladesh). Dietary energy intake among the South Asian countries show a very narrow variation, 2270 to 2370 Kcal/person/day. The latest data provided by FAO show that prevalence of under nutrition based on dietary energy intake remains highest in Bangladesh despite tremendous progress made by the country in improvement of under nutrition. Population facing under nutrition in Bangladesh has declined from 38 per cent during 1990-1992 to 26 per cent in the years 2006-2008. There has been little progress in reducing prevalence of under-nutrition in India, Sri Lanka and Nepal. Despite decline in per cent of population facing under nutrition, the number of undernourished persons has increased over time in all countries except Sri Lanka and Bangladesh. Number of

Table 10: Incidence of hunger and under nutrition in South Asian countries and world

Country	Dietary Energy Consumption (Kcal/person/day)		Prevalence of undernourishment in total population (%)		Number of undernourished persons (million)	
	1990-1992	2006-2008	1990-1992	2006-2008	1990-1992	2006-2008
Bangladesh	1960	2270	38	26	44.4	41.4
India	2290	2360	20	19	177.0	224.6
Nepal	2190	2340	21	17	4.2	4.7
Pakistan	2210	2280	25	25	29.5	42.8
Sri Lanka	2170	2370	28	20	4.8	3.9
South Asia	2270	2360	22	20	267.5	330.1
Developing World	2440	2640	20	15	833.2	839.4
Total World	2610	2790	16	13	848.4	850

undernourished persons in India has increased from 177 million in 1990-1992 to 225 million in the recent years.

Trade Liberalisation and Food Security

Regional trade offers considerable scope to meet food deficiencies in SAARC countries. Recently, SAARC countries have moved further to liberalize trade and investment in the region and they have signed “South Asia Free Trade Agreement” in January 2004. It includes 8 members including Afghanistan and came into force in January 2006. Presently intra-regional trade in South Asia constitutes 5 per cent of total trade in the region. After signing of SAFTA, share of SAARC countries in world export has increased from 1.3% in 2005 to 1.7% in year 2009 (Table 11). However, share of intra-regional trade of South Asia in the same period show a decline. This implies that total trade from south Asia has increased at a faster rate than the growth in world trade after 2005, however, trade within the South Asian block has increased at a lower rate than trade with rest of the world. There is a need to examine reasons for slower growth in intra-regional export as compared to inter-regional growth despite creation of SAFTA.

Table 11: Trade share of South Asia

Trade particular	1995	2005	2009
Share of South Asia in world export %	0.9	1.3	1.7
Share of intra regional export in total export %	4.5	6.6	5.4

The major factor for low volume and low share of intra-regional trade seems to be the poor trade facilitation for intra-regional trade, like efficiency of custom, other border procedures, quality of transport and IT infrastructure etc. Reducing barriers to regional FDI and trade facilitation are complementary to each other. Thus, along with trade facilitation, there is a need to provide liberal

and conducive environment for FDIs in the area of food chain development and food processing. These will be beneficial for producers as well as consumers and for improving food security. Due to year to year fluctuations in production at country level, surplus in a south Asian country is not considered reliable source of supply to meet deficit and import demand by other country. This needs to be overcome by building regional stocks of food under SAFTA. SAFTA could also be used as an appropriate forum not only to address intra-regional trade disputes but also for taking collective stand on agriculture and food security related issues in WTO.

Instability in Prices of Selected Livestock Commodities in India: An Analysis of Post-Liberalisation Period

A. Suresh

Instability in prices of agricultural commodities has implications on various sectors of the economy and livelihood of millions of rural households dependent on it. The steps for liberalization of the economy since early 1990s were feared to import the instability in the international prices to the domestic prices. The study analyzed the instability in the prices of edible non-milk livestock commodities for the period of 1994-2010. The study period of 1994-2010 was classified into two distinct periods - 1990s and 2000s. The period of 1994-1999 was considered as the Period I (1990s) and 2000-2010 was considered as Period II (2000s) just to capture difference between the initial turbulence in the economy immediately after liberalization and the later periods when the domestic policies adjusted according to changed economic environment.

A general rise in the prices of the livestock commodities since liberalization was visible; but during the later periods, the rising trend has decelerated for all commodities (Table 12).

In general, the instability has also declined during the recent years, except for a few commodities. The study has also decomposed the prices into its constituent components, viz. seasonal, trend and cyclical and irregular components. The seasonal effects are generally high during the periods of December to June. The variability in the cyclical and irregular components increased during the later periods. The effect of these factors varied across commodities.

Impact of KSAMB's Free SMS Service to Farmers on Marketing and Prices of Agricultural Produce in Karnataka

Ganeshagouda I. Patil, Parmod Kumar and P. Ramasundram

The Karnataka State Agricultural Marketing Board (KSAMB) is the first

organization to introduce dissemination of agricultural prices to the farming community through free mobile SMS (Short Message Service) alerts on daily basis of all the regulated markets in the State. The study was carried out with three specific objectives: (i) to study the dissemination process of price information by KSAMB; (ii), to study the reach and depth of dissemination across farmers and crops, and (iii), to assess the impact of price dissemination on farming community. The information



Table 12: Growth rates and variability in prices of various commodities (per cent)

Particulars	Growth Rate			Instability		
	Period I	Period II	Overall	Period I	Period II	Overall
Nominal Prices						
Eggs, Meat & Fish	9.14***	4.52***	5.11***	5.22	4.91	5.02
Eggs	4.86***	3.47***	2.83***	6.39	8.50	7.31
Fish (Marine)	9.21***	5.91***	4.78***	12.88	8.39	9.45
Fish (Inland)	11.87***	4.15***	8.30***	10.74	13.83	13.21
Mutton	9.45***	6.04***	5.24***	6.01	6.07	5.77
Beef & Buffalo Meat	19.60***	8.00***	9.41***	27.03	8.11	16.25
Poultry (chicken)	3.55***	-3.45***	-2.58***	7.71	8.07	7.77
Pork	8.96***	5.72***	4.20***	11.21	10.37	10.1
Real Prices						
Eggs, Meat & Fish	3.78***	-0.63	0.04	4.97	6.09	5.57
Eggs	-0.29	-1.63**	-2.14***	6.24	9.40	7.86
Fish (Marine)	3.84*	0.69	-0.27	12.48	7.90	9.06
Fish (Inland)	6.37***	-0.98	3.07***	9.63	15.16	13.67
Mutton	4.07***	0.82	0.16	5.52	6.22	5.72
Beef & Buffalo Meat	13.73***	2.69***	4.13***	28.13	8.42	16.87
Poultry (chicken)	-1.54	-8.20***	-7.28***	8.34	8.82	8.37
Pork	3.61	0.51	-0.83	10.58	10.49	9.99

Note: 1) Period I: 1994 to 1999; Period II: 2000 to 2010; Overall: 1994 to 2010, 2) ***, ** and * indicates significance at I, 5 and 10 per cent levels, respectively.

relating to procedural steps in dissemination of price information, the extent of crop and farmers coverage in the state, and 110 sample registered farmers mobile number at the krishimaratavahini website for availing market prices were collected from the KSAMB and National Informatics Centre (NIC), Bangalore. Around 1,20,000 market participants (farmers/traders) got registered for availing the market price information alerts. Around 86 per cent of the farmers received messages at appropriate time and 79 percent commented that information was clear, simple, accurate and reliable. Around 96 percent of farmers revealed that the content of the information had impacted the income of the respondents and around 79 percent of them opined that the daily information on price helped in taking appropriate marketing decision regarding the selection of markets and preferable time of sale. It also helped them to save time and reduced cost of search of information. The study revealed that introduction of ICT in regulated markets in the state has brought a paradigm shift in agricultural marketing.

Supermarket chains in A.P. - Effects on Farmers, Traditional Retailers and Local Vendors

M. B. Dastagiri

There is lot of debate on effect of supermarkets on farmers, retailers and local vendors. However, empirical evidence on these effects is either missing or weak. The study was conducted in Vontimamidipalli, Hyderabad, which is a hub of private supermarkets. It is based on the data of 40 respondents each collected from super markets, farmers, local retailers, vendors and consumers. The discussion was held with officials of supermarket supply chains namely, Reliance, More, Heritage, Spencer, Food World etc. The detailed information was collected on products dealt, supply development programs initiated; benefits of linking farmers to super markets; effects of supermarkets on farmers, local retailers, consumers and vendors; opportunities; constraints and suggestions for betterment of market players, Results are shown in Table 13. Super markets are adopting direct marketing

Table 13: The effects of supermarket chains on farmers, retailers and local vendors in horticulture marketing in Andhra Pradesh

S. No	Particular	Reliance	More	Heritage
1.	Farm products covered	<ul style="list-style-type: none"> Deal with many types of vegetables and fruits. 	<ul style="list-style-type: none"> will procure all types of crops grown in the locality. 	<ul style="list-style-type: none"> Deal with all fruits and vegetables
2.	Market model	<ul style="list-style-type: none"> Direct market model with backward linkages 	<ul style="list-style-type: none"> Direct market model with backward linkages 	<ul style="list-style-type: none"> Direct market model with backward linkages
3.	Development initiatives by the respective companies	<ul style="list-style-type: none"> Arranging meetings with farmers and presentation of success stories from states like Karnataka 	<ul style="list-style-type: none"> Technical guidance sometimes offered by visiting farmers' fields 	<ul style="list-style-type: none"> Custom farming (agriculture diploma candidates will be a part of teams and sent to the fields for technical guidance)
4.	Benefits of linking farmers with companies	<ul style="list-style-type: none"> Prompt payment Accurate weighing Stable price Returning Gunny bags 	<ul style="list-style-type: none"> Low transport charges No commission Correct weighing 	<ul style="list-style-type: none"> Assured market Productivity will increase because of assured markets and proper planning

5.	Constraints	<ul style="list-style-type: none"> Initially it is taking time to acclimatize to collection centers 	<ul style="list-style-type: none"> Now paying 1% cess to government 	<ul style="list-style-type: none"> No credit is advanced
6.	Effects	<ul style="list-style-type: none"> Spiraling of prices and cobweb phenomena observed 	<ul style="list-style-type: none"> Absence of middlemen 	<ul style="list-style-type: none"> Spiraling of prices and cobweb phenomena observed Absence of middlemen
7.	Suggestions	<ul style="list-style-type: none"> Should purchase entire quantity brought by the farmers irrespective of grading. Seeds should be of high quality 	<ul style="list-style-type: none"> Should supply quality seeds Export linkage is suggested 	

models with backward linkages saving farmers from market cost, other charges and complete elimination of middlemen. Farmers supplying to super markets have advantages getting technical guidance, market information on prices, perfect weights, spot payments etc; besides having opportunity of development of high value commodities market supply chain.

The study shows that farmers who are supplying to supermarkets are more productive and supermarkets are not effecting

the procurement and business of local retailers and vendors.

Institutional Change

Livestock for Inclusive and Sustainable Agricultural Growth

P. S. BIRTHAL and D. S. NEGI

In the past three decades, output of livestock grew at an annual rate of 4.1 percent raising its share in agricultural GDP from 19% in 1980-81 to 27% in 2010-11 (Table 14). The rate of

Table 14: Share of livestock in gross value of output and growth of agricultural sector (at 2004-05 prices)

State	% share of livestock in value of output of agricultural sector		% annual growth in livestock sector		% annual growth in agricultural sector	
	TE 1992-93	TE 2008-09	1990s	2000s	1990s	2000s
Andhra Pradesh	22.5	30.2	6.3	5.3	3.0	4.6
Assam	10.6	13.0	1.2	3.5	1.9	0.1
Bihar	28.7	36.8	6.2	7.4	6.6	3.9
Gujarat	19.6	25.4	5.3	6.2	3.4	5.0
Haryana	27.8	32.0	3.6	3.8	2.9	2.9
Himachal Pradesh	27.3	28.3	3.7	3.3	3.3	3.5
Jammu & Kashmir	25.4	33.3	8.5	4.0	3.1	4.5
Karnataka	17.5	20.6	5.4	0.9	3.0	1.1
Kerala	19.5	21.0	2.9	0.7	2.5	0.6
Madhya Pradesh	26.8	27.0	3.1	3.2	3.3	2.9

Maharashtra	22.1	20.1	4.0	3.1	3.9	4.1
North-eastern states	22.3	23.1	4.5	4.5	3.9	2.7
Odisha	10.2	18.6	4.2	7.7	0.4	3.4
Punjab	26.2	33.1	4.1	2.5	2.0	1.7
Rajasthan	33.9	38.5	5.2	1.7	3.3	2.3
Tamil Nadu	27.4	29.0	1.9	3.5	2.4	1.8
Uttar Pradesh	21.0	28.2	4.5	3.6	3.0	1.5
West Bengal	21.6	20.9	2.5	2.1	3.5	1.5
All India	23.3	26.8	3.9	3.6	2.9	2.7

Note: Bihar includes Jharkhand; Madhya Pradesh includes Chhattisgarh; North-eastern states exclude Assam; Uttar Pradesh includes Uttarakhand.

growth was faster than overall agricultural growth, indicating importance of livestock in generating sustained agricultural growth. The sector contributed 31% to the agricultural growth during the 1990s, which increased to 36% during the 2000s. There is a wide inter-state variation. In the triennium ending (TE) 2008-09, the share of livestock in agricultural output was as low as 13% in Assam and as high as 39% in Rajasthan. But in most states, livestock sector has consolidated its position over time. Andhra Pradesh, Bihar, Odisha and Gujarat have realized robust growth. During the 2000s, the livestock sector in these states, barring Andhra Pradesh, grew at an accelerated rate of 6% to 8%. During the 1990s, the growth of the livestock sector was also robust in Jammu and Kashmir, Karnataka and Rajasthan. There was a sharp deceleration in livestock sector growth in Karnataka and Rajasthan. In Punjab, Maharashtra, Uttar Pradesh and Himachal Pradesh, the livestock sector increased at around 4% a year during the 1990s but came under pressure during the 2000s, especially in Punjab. Assam and Tamil Nadu experienced accelerated growth.

Past studies have shown that agricultural growth is more pro-poor. However, the extent to which the poor benefit from growth of the

livestock sector depends on whether they possess livestock. In India, more than two-thirds of farm households are reported to be associated with livestock, and distribution of different livestock is more egalitarian than land. In 2002-03, households cultivating less than or equal to 1.0 hectare of land (marginal farm households) comprised more than 48% of total rural households and controlled 53% of country's cattle and 50% of buffaloes against their share of 24% of land. Their share was much higher in small animals such as sheep, goats, pig and poultry as raising these species requires less initial investment and they provide a quick and regular stream of income. Over time, they have consolidated their position in both land and livestock resources. A similar story unfolds for different states.

The relationship between poverty and livestock income was probed econometrically. It shows that the head count poverty is negatively and significantly associated with income from livestock as well as crops. The marginal effect of livestock on poverty reduction is -0.36 against -0.25 for crops, implying that growth in the livestock sector has a larger impact on poverty reduction. The poverty gap regression also provides a similar conclusion.

Operationalizing the Pro-poor Potential of Livestock

P. S. Birthal and V. K. Taneja

By the end of the Twelfth Plan (2012-17), the demand for milk is estimated to be 141 million tonnes, and of meat, egg and fish at 15.8 million tonnes. The expanding demand for animal food products is an opportunity for the poor to enhance their income, and escape poverty. The current productivity levels of most livestock species are low and improving livestock productivity is a major challenge. The average milk yield of a cow in India in 2009-10 was 1,230 kg per annum (Table 15) - about half the world average and much less than in major milk-producing countries such as New Zealand, Australia and the US. The productivity of meat animals such as sheep, goats and pigs is substantially less compared to world averages. More worrisome is the deceleration in productivity growth. There was a sharp deceleration in the yield growth of dairy animals. The growth in milk yield of crossbred cows decelerated from 1.8% during the 1990s to 0.7% during the 2000s and of buffaloes from 1.7% to 1.2% (Table 15). The productivity of meat animals (sheep, goats and pigs) has been stagnating for quite long.

Public Distribution System: Its Role and Functioning

Anjani Kumar and Sant Kumar

The role of PDS in meeting the consumption requirement of households has increased over time (Table 16). The share of PDS in the total rice consumption in the country has increased from 9.9 per cent in 1993-94 to 21.7 per cent in 2009-10. Similarly, the share of PDS in wheat consumption was 12.7 per cent in 2009-10, up from 0.4 per cent in 1993-94. The share of PDS in the consumption of rice and wheat shows wide inter-state variations. The share of PDS in the consumption of rice has increased in all states, except in Gujarat, Haryana, Kerala, Punjab, Rajasthan and Uttarakhand. The share of PDS in wheat consumption has also increased in all the states, except Andhra Pradesh and Assam. The share of PDS in the total consumption of rice and wheat was higher in Andhra Pradesh, Chhattisgarh, Himachal Pradesh, Jammu & Kashmir, Karnataka, Kerala, Odisha and Tamil Nadu. In these states the PDS seems to be working well and households are taking advantage of this scheme.

In some states like Assam, Bihar, Uttar Pradesh, PDS does not seem to have made much headway. In general, the penetration of

Table 15: Growth in milk output of different species and milk yield

Year	Milk (million tons)			Annual milk yield (kg/in-milk animal)		
	Indigenous cow	Crossbred cow	Buffalo	Indigenous cow	Crossbred cow	Buffalo
1992-93	16.7	7.6	31.0	602	2033	1263
2000-01	18.8	14.1	43.4	701	2351	1478
2009-10	22.5	25.4	59.2	781	2508	1668
	% annual growth					
1992-93 to 1999-2000	1.6	7.6	3.9	1.7	1.8	1.7
2000-01 to 2009-10	1.8	6.0	3.2	1.1	0.7	1.2

Table 16: Share of PDS in rice and wheat consumption in different states of India: 1993-94 to 2009-10

State	Rice		Wheat		Rice and Wheat	
	1993-1994	2009-2010	1993-1994	2009-2010	1993-1994	2009-2010
Andhra Pradesh	20.6	29.7	9.1	4.0	20.4	28.5
Assam	3.2	10.4	2.7	1.3	3.1	10.0
Bihar	0.2	4.7	0.3	4.8	0.3	4.7
Chhattisgarh	2.2	38.8	2.4	28.7	2.3	37.7
Gujarat	20.1	13.7	0.4	10.5	6.6	11.4
Haryana	4.3	0.5	0.0	12.4	0.4	11.4
Himachal Pradesh	32.5	43.3	0.3	44.3	12.3	43.9
Jammu & Kashmir	5.5	53.4	0.3	32.5	2.2	46.9
Jharkhand	0.3	12.7	1.9	15.4	0.7	13.5
Karnataka	14.5	34.5	1.4	26.1	12.5	32.9
Kerala	44.4	26.2	13.7	27.1	41.8	26.3
Madhya Pradesh	3.6	17.2	0.2	19.7	2.0	19.2
Maharashtra	13.4	22.4	0.3	21.4	7.2	21.8
Odisha	0.8	22.9	5.1	12.6	0.9	22.3
Punjab	2.3	0.1	0.1	12.7	0.3	11.5
Rajasthan	7.4	0.3	0.1	9.3	0.3	9.0
Tamil Nadu	17.9	47.6	2.8	51.8	17.1	47.9
Uttar Pradesh	3.2	16.1	0.0	6.8	0.9	10.0
Uttarakhand	45.9	19.6	0.2	13.2	20.6	16.0
West Bengal	1.7	5.3	2.0	28.3	1.7	8.3
All India	9.9	21.7	0.4	12.7	6.0	17.8

PDS has increased in almost all states of country over time and the share of PDS grain in household food consumption has increased. These findings suggest that the PDS has proved to be one of the most effective instruments of government policy over the years in stabilizing of foodgrain prices and making their availability to consumers at affordable price.

Risk Assessment and Insurance Products for Agriculture

S. S. Raju, Ramesh Chand and Diana S.

The study estimated the risk involved in production of various crops at disaggregate

and aggregate level; assessed farmer's perception on insurance products and developed three agricultural insurance products-Wine Grape Insurance Structuring Automation Tool (WIGISAT), Potato Insurance Product and Tensiometer Insurance Product; role of various institutions in agriculture; and developed an online Decision Support System (DSS) for insurance products in agriculture. The major findings and policy implications emerging from the study are:

- (i) Agricultural insurance schemes launched in the country have served the farmers in a limited way only. The coverage in terms of area, number of farmers covered (15-

- 18%) and value of agricultural output insured is very small and most of these schemes have yet to achieve financial viability.
- (ii) A comparison of existing crop insurance models based on the yield index and the weather index in general and based on product performance and stakeholders and farmers' perceptions in particular are complementary in nature, and there is a need and scope for designing 'double-trigger' or 'multiple-trigger' products.
 - (iii) WIGISAT for grapes has insurance product design transparency and involvement of growers in the designing process. This has improved the credibility of a product which leads to higher rate of insurance adoption.
 - (iv) Customization of index based insurance products are dovetail to soil type, crop husbandry practices, dates of planting, crop varieties, level of investment, etc. products to specific farm situations is quite challenging and is indispensable for higher levels of up-take.
 - (v) Insurance awareness, financial literacy and convenience in availing crop insurance are vital from farmers' view point and cost effectiveness is vital from insurer's view point for increasing crop insurance penetration in the country.
 - (vi) Timely settlement of claims is crucial. This require strengthening of the existing system by cleaning of historical data and creation of a nationally consistent database with timely dissemination of information from crop-cutting-experiments; introduction of remote sensing technology for estimating the farmers' yield losses and use of new distribution channels like post offices and micro insurance agencies for timely settlement of claims.
 - (vii) Crop insurance penetration should be increased to 50 per cent in the XII Five Year Plan.
 - (viii) The density of automatic weather stations to minimize the basis risk should be increased.
 - (ix) The issue of private sector involvement in agricultural insurance may be addressed by means of the system of co-insurance with AICL as a lead insurer with underwriting capabilities and contacts with multiple agencies and private insurance companies taking shares according to their capability.
 - (x) Valued-added services like weather forecasts, agro-advisories could be bundled with crop insurance, for popularizing crop insurance and concrete action is required from the government, in terms of a suitable law, like 'agriculture risk protection act', etc.

Agricultural Growth and Modelling

All India and State level Agricultural Growth and its Determinants

Ramesh Chand and Shinoj Parappurathu

Trend in growth rate of national GDP of agriculture sector was studied based on decadal trend growth rates by fitting semi-log trend to the smoothened data. The series begins with 10-years period from 1951/52 to 1961/62 and is extended up to the latest decade starting with 2001/02 and ending with the year 2011/12. The growth rates derived from this exercise are plotted in a graph in Figure 5. It shows that the growth trajectory of Indian agriculture is heading towards target growth rate of 4 per cent. The study identifies role of various factors in changing path of growth trajectory.

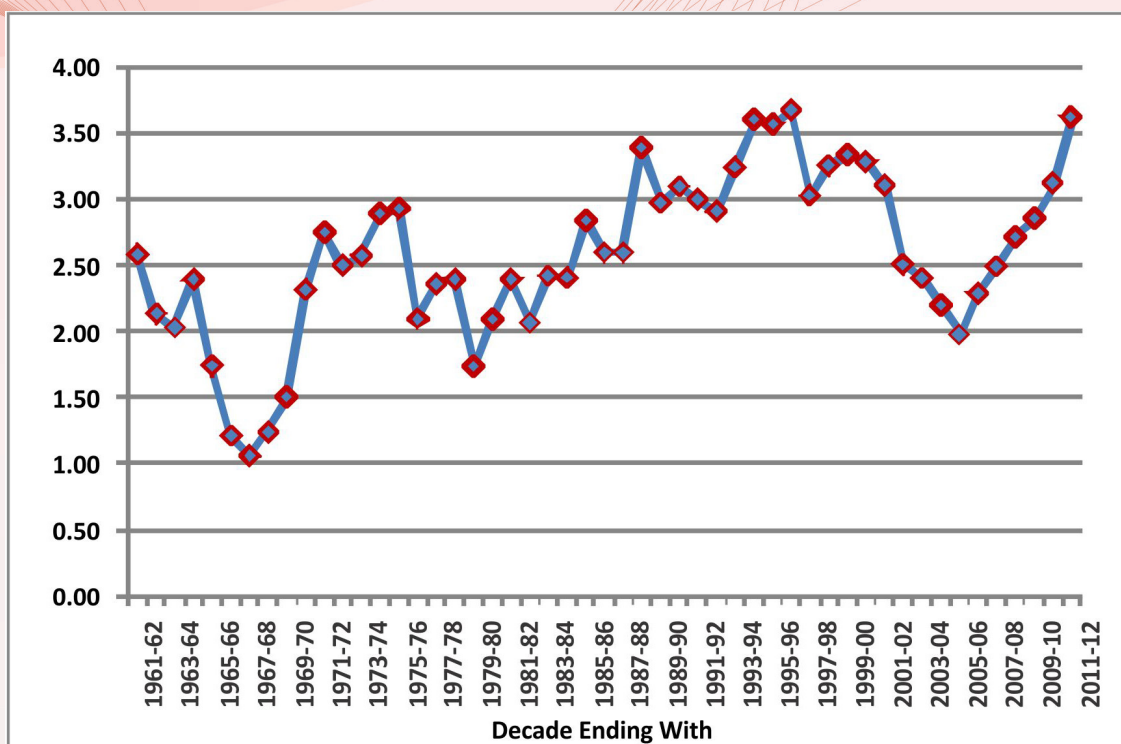


Figure 5: Trend growth in GDP-Agriculture (at 2004-05 prices) based on 10 years period: Decade ending with 1961/62 to decade ending with 2011/12 (Per cent)

State Level Growth

Performance of agriculture at state level during the last decade was examined based on growth rate in Net State Domestic Product (NSDP)-Agriculture during 2000-01 to 2010-11 at 2004/05 prices. Six out of 20 major states achieved growth rate higher than the national

target (Box 2). These are Gujarat, Rajasthan, Chhattisgarh, Madhya Pradesh, Andhra Pradesh and Jharkhand. One fifth states are close to the national target of 4% growth rate in agriculture. States of Kerala, UP, Uttarakhand and J&K achieved less than 2 per cent growth in agriculture sector during 2001 to 2011.

Box 2: Distribution of states according to agricultural growth during the last 10 years

State	Growth rate	State	Growth rate
Kerala	1.11	Himachal Pradesh	3.41
U.P.	1.72	Haryana	3.41
J & K	1.78	Odisha	3.61
Uttarakhand	1.78	Maharashtra	3.87
Punjab	1.85		
West Bengal	2.18	M.P.	4.42
Bihar	2.52	Rajasthan	4.76
Tamil Nadu	2.74	A.P.	4.76
Karnataka	2.90	Chhattisgarh	5.58
Assam	2.93	Jharkhand	6.16
		Gujarat	6.85

Food Security and Undernourishment in India: Assessment of Alternative Norms and the Income Effect

Ramesh Chand and Jaya Jumrani

The total food production in India has increased at a much faster pace than the growth in human population during the last four decades. However, the effect of such an increase in per capita food production has not been visible in terms of the improvement in food and nutritional security in the country. Rather, according to some National Sample Survey Office (NSSO) data-based studies, deterioration has been observed during 1987-88 to 2004-05 in the prevalence of undernourishment based on energy intake.

Estimates of undernutrition (calorie deficiency) and malnutrition (protein deficiency) were prepared for various income groups using unit-level NSSO data on 100855 households for 66th Round for year 2009-10 on Consumer Expenditure Survey. The demographic and activity differentials across individuals were also captured in this study. The nutritional status in India during the period 2009-10 was examined using two indicators. First, based on ICMR-NIN (Indian Council of Medical research – National Institute of Nutrition) norm and the second

based on FAO norm of 1800 Kcal. The average intake levels of poor households were at levels even lower than the FAO norm of 1800 Kcal. Calorie deficiency was higher for rural areas than urban areas. More than half of the income poor population was found to be calorie deficient in both rural and urban areas across all the choices of norms. Incidence of undernutrition and malnutrition was much higher based on ICMR-NIN norm.

Undernutrition was not confined to poor households. Such a population can be termed to be suffering from ‘involuntary hunger’ as they do not have the necessary income resources to take care of the quantity aspect of their intakes. However, more than 50 per cent of middle income and more than 30 per cent of upper income households were also found consuming lower than required dietary energy. These individuals can be termed as suffering from ‘voluntary hunger’ as they have the necessary income resources but still they are not consuming – may be out of choice or due to other non-income factors. It was also observed that the percentage of population with inadequate protein intakes was higher in urban households as compared to their rural counterparts (Table 17).

Table 17: Prevalence of under-nutrition and malnutrition based on FAO norm and ICMR-NIN norm in various income groups

Locale and Expenditure class	Undernourishment (%)		Malnourishment (%)
	FAO norm	ICMR - NIN norm	ICMR - NIN norm
Rural			
Poor	56.9	82.6	50.0
Middle income	21.3	61.3	31.7
High income	7.0	39.0	14.0
All rural	32.3	67.0	36.7
Urban			
Poor	66.7	78.5	59.9
Middle income	33.7	55.2	40.8
High income	10.1	29.7	22.8
All urban	39.5	58.7	43.8
Rural+Urban	34.2	64.8	38.7

Empirical evidence shows that an inverse relationship between food prices and hunger cannot be generalised and recent spikes in food prices have not caused any adverse effect on prevalence of under-nutrition – they have rather improved under-nutrition through positive effect on food production. In terms of the brief appraisal of the FAO methodology, it was concluded that such an approach is bound to lead to erroneous conclusions as it deals with food availability rather than food intakes. It was expected, and was found to be the case for India, that the level of hunger will be an underestimate when the use of food commodities for non-food purposes is underestimated. The paradox of hunger amidst plenty prevailing in India suggests that there are historical and cultural factors that make India a different case and need further research. It is now clear that income growth and elimination of poverty is a “necessary” but not a “sufficient” condition for reducing

undernourishment and malnourishment in India.

Sources of growth in Indian agriculture

P.S. BIRTHAL and D. S. NEGI

The agricultural sector grew at an accelerated rate in the first three decades of the Green Revolution (1965/66 to 1995/96), culminating into an annual growth of 3.5% during mid-1980s to mid-1990s. Agricultural growth, however, came under pressure towards the late 1990s, which continued until 2005/06.

Cereals, mainly rice and wheat, continue to dominate the agricultural sector (Table 18). In the decade of 2000s, cereals occupied 54 per cent of the total cropped area and contributed only 37% to the total value of crop output. Horticultural crops (fruits, vegetables, plantations and spices & condiments) make up the second largest crop group, in value terms. These crops, with a share of about 10

Table 18: Share of important crops in area, value of output and growth

Crops	% share in real value of output			% annual growth in real value of output			% share in overall growth		
	1980s	1990s	2000s	1980s	1990s	2000s	1980s	1990s	2000s
Rice	22.4	21.7	19.0	3.3	3.1	-0.2	23.1	20.5	-1.7
Wheat	12.0	12.7	12.6	2.4	5.5	1.2	10.2	20.7	4.6
All cereals	42.4	40.4	37.0	2.0	3.6	0.7	30.7	43.0	6.9
Pulses	7.3	6.2	5.2	2.6	1.0	3.0	4.6	0.3	4.8
Oilseeds	12.4	14.1	12.1	6.9	-0.7	5.4	21.4	-2.6	13.0
Fibres	4.7	5.5	5.4	1.7	2.6	9.9	4.8	1.8	14.7
Sugarcane	8.1	8.6	8.8	1.2	5.0	0.0	3.8	13.1	-1.3
Plantations	1.7	1.8	1.6	5.6	2.7	5.0	6.8	0.0	1.1
Spices & condiments	2.8	3.8	3.9	8.5	6.8	3.8	4.8	5.1	5.4
Fruits	9.4	10.6	14.2	4.4	6.2	5.5	11.3	20.4	24.6
Vegetables	9.8	11.5	13.5	3.6	6.8	6.7	11.0	19.1	28.9
Horticulture	23.7	27.7	33.2	4.6	6.3	5.8	33.9	44.6	60.0
Other crops	1.0	0.9	0.9	0.9	1.0	6.8	0.8	-0.1	2.0
All Crops	100.0	100.0	100.0	3.1	3.7	3.3	100.0	100.0	100.0

per cent in the total cropped area, contributed more than one-third to the total value of crop output in the 2000s. Oilseeds, sugarcane, cotton and pulses are other important crops.

Horticultural crops experienced relatively faster growth throughout the past three decades. Oilseeds also witnessed a robust growth in the 1980s. This trend, however, could not sustain for long; the growth rate fell drastically in the 1990s, but made an equally strong recovery in the 2000s. Wheat output, in value terms, grew at an accelerated rate in the 1990s, but decelerated to 1.2 per cent in the 2000s. Rice, the main staple food crop of India, experienced a strong decline in the 2000s. Accordingly, the relative contribution of crops or crop groups in the overall growth changed over time (Table 18). In the 1980s, rice and oilseeds accounted for a significant share in growth, and were followed by fruits, vegetables and wheat. In the subsequent decade, wheat, fruits and vegetables became more important, and oilseeds completely ceased to be a source of growth. However, in the 2000s, horticulture emerged as an engine of growth raising its share to 60 per cent.

Decomposition of growth by its sources, i.e. area expansion, price increases, yield improvements or technological change, and area re-allocation or diversification indicate that technology was the main source of growth in the 1980s (Figure 6). Diversification (from lower-value to higher-value crops) was the second largest source of growth (26%); followed by area expansion (17%). Prices did not have any significant effect on growth. Sources of growth changed drastically in the 1990s. Technology became relatively a less important source of growth because of slowing down of growth in yield of rice and wheat—the pillars of Green Revolution in India. Diversification, on the other hand, consolidated its share in agriculture growth. There was also

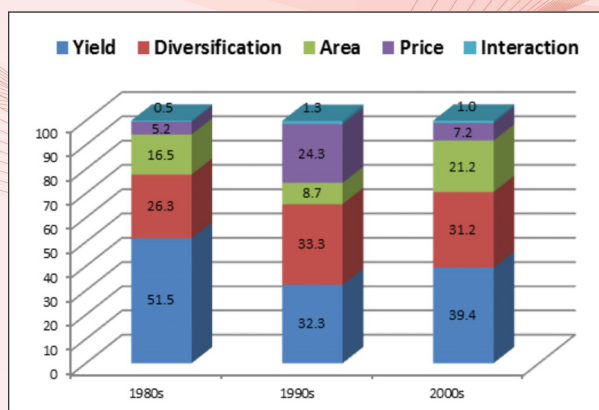


Figure 6: Contribution of different sources of growth in crop sector (%)

a sharp increase in the contribution of prices to growth mainly because of terms of trade in favor of agriculture. In the 2000s, the contribution of prices declined drastically suggesting that price-led growth cannot sustain in the long-run. There are chances that price-led growth may distort cropping patterns, degrade natural resources and worsen income distribution, as the benefits of price increases accrue in proportion of the marketable surplus.

Diversification, on the other hand, maintained its share in growth. It is worth mentioning here that throughout the past three decades, land re-allocation to high-value crops took place largely from less profitable crops like millets, sorghum and pulses; and there was a little, if any, diversion of land from wheat and rice. Given the growing importance of high-value crops, research on horticultural crops merits more attention in research resource allocation on three counts.

Status of Food and Nutritional Security in India

Anjani Kumar and Sant Kumar

India has not only achieved self-reliance in foodgrains production but often it is faced with the challenge of management of huge foodgrain surplus that accumulates as public

buffer stocks. The increase in production has been much higher for horticultural, fish and livestock products than foodgrains. The per capita availability of non-foodgrains food commodities witnessed a considerable increase which helped in catering to the diversified food needs of households (Table 19).

The patterns of calorie as well as protein intake do not depict a clear trend for both rural and urban households. Between 1983 to 2009-10, the calorie and protein consumption has declined in the rural areas and increased in the urban areas (Table 20). The decline has been from 2240 Kcal/capita/day to 2147 Kcal/capita/day for calorie intake and also from 63.5 g/capita/day to 59 g/capita/day in protein intake in the rural areas. The per capita calorie intake in urban areas increased slightly from 2070 Kcal/capita/day to 2123 and protein from 58.1

g/capita/day to 58.8 g/capita/day during this period. The consumption of fat consistently increased overtime both in rural and urban areas. The decline in calorie intake is attributed, by many scholars, to the declining requirements of energy, because of sedentary life-style, increasing mechanization of agricultural operations and same domestic activities and increasing use of mechanized mode of transport, particularly in the rural areas. However, these arguments seem to be misplaced at least on two counts. First, between 2004-05 and 2009-10 the per capita intake of calories increased in both rural and urban areas. Second, in the poor households, the consumption of calories increased marginally in both poor and rich households between 1983 and 2009-10; though fluctuated in between.

Table 19: Per capita production or availability of different food commodities in India; 1983-84 to 2009-10
(Kg/annum)

Year (TE)	Food-grains	Cereals	Pulses	Vegetables	Fruits	Milk	Eggs	Fish
1983-84	198	181	17	56	31	52	17	3.5
1993-94	206	191	15	68	33	67	27	5.1
2004-05	184	172	12	86	45	84	39	5.9
2009-10	198	185	13	113	60	94	49	6.9

Table 20: Trends in consumption of calories, protein and fats by rural and urban households in India; 1983 to 2009-10
(Per capita/day)

Year (TE)	Calories (kcal)		Protein (g)		Fats (g)	
	Rural	Urban	Rural	Urban	Rural	Urban
1983-84	2240	2070	63.5	58.1	27.1	37.1
1987-88	2233	2095	63.2	58.6	28.3	39.3
1993-94	2153	2073	60.3	57.7	31.1	41.9
1999-00	2148	2155	59.1	58.4	36.0	49.6
2004-05	2047	2021	55.8	55.4	35.4	47.4
2009-10	2147	2123	59.3	58.8	43.1	53.0



III. POLICY INTERACTIONS AND ADVOCACY

Policy input based on in-house research to ICAR, various ministries, Planning Commission, Public Organisations, and State Governments.

1. Provided policy input as Member and Chairperson of several high level policy committees as under:

Coordination Committee for Organization of Studies (CCOS) in the field of Agricultural Economics, Department of Agriculture and Co-operation, Ministry of Agriculture, Government of India
Nodal Officer for SAARC matter and Member of GB SAIC, Ministry of Agriculture, Government of India
Steering Committee to oversee the development, follow-up action on the initiative declared in Ministerial declaration at G-20, DAC and ICAR
Issues related to the Research and Development (R&D) in Agriculture sector, With reference to Prime Minister's Office, committee constituted by ICAR
Working Group on Linking Farmers to Market in Haryana, Haryana Kisan Ayog
Committee to Formulate Long Term State Agriculture Policy, Constituted by Govt. of Punjab
Agricultural Expert Advisory Committee for U.P, U.P. Government , Lucknow
Focal Point for the Agricultural Market Information System (AMIS), Ministry of Agriculture, Department of Agriculture & Cooperation
Advisory Committee on "Agricultural Outlook and Situation Analysis Reports with Focus on Food Security", National Council of Applied Economic Research , New Delhi.
DARE/ICAR for coordination between the two Departments for service on "Information on Marketing Infrastructure"
Advisory Committee on Food and Agriculture, Technology Vision 2035, TIFAC, Ministry of Science and Technology, GOI.

- 2. Prepared Agriculture R&D Vision 2050
- 3. Prepared framework for Performance Indicators for various types of ICAR Institutes
- 4. Monitor national and international agriculture situation and present views to media regularly.
- 5. Regularly report views on TV channels and Newspaper.

Policy Dissemination Workshop on “Biofuels and the Poor” 19 April, 2012 (NCAP-IFPRI collaborative project)

A Policy Dissemination Workshop on “Biofuels and the Poor” was organized at NCAP on 19 April, 2012, which was coordinated by Dr. S. S. Raju and Dr. P. Shinoj. Forty four stakeholders, representing different states of India, participated in the workshop. The workshop provided an overview of work done by NCAP and IFPRI recently on impact of biofuels in India. The workshop also discussed the implications of the findings on biofuel policy and market impacts for state level and national policy on biofuel.

Agriculture Organization, Office representative in India, jointly organized two workshops. 1) National Workshop for the “Preparation of Country Programming Framework (CPF)” on 20 November, 2012 at NCAP, New Delhi. 2) Final National Consultation Workshop on “Country Programming Framework (CPF) 2013-2017” on 20 February, 2013 at NASC Complex, New Delhi. The workshops were attended by 65 key stakeholders and experts from government, academia, private sector and civil society organizations. The main purpose of these workshops was to discuss, prepare and improve the CPF document through strategic revisions. Upon receipt of necessary FAO suggestions / inputs, the CPF document shall be submitted to the Government of India for endorsement.



Participants of the Policy Dissemination Workshop on “Biofuels and the Poor” with chief guest Dr A K Singh, Ex-DDG (NRM), ICAR at NCAP, New Delhi on 19 April, 2012

FAO workshops on ‘Country Programming Framework (2013-2017)

National Centre for Agricultural Economics and Policy Research (NCAP) and Food and

The points emerged from these discussions should be brought out as a document. They include, increasing demand for fruits and vegetables, food safety issues, agriculture-

nutrition- health link, getting out of the productivity syndrome and emergence of ecological concerns and establishment of a National Centre for ICT in Agriculture. Further, the workshop prioritized the emerged CPF strategies under 6 broad headings. They include:

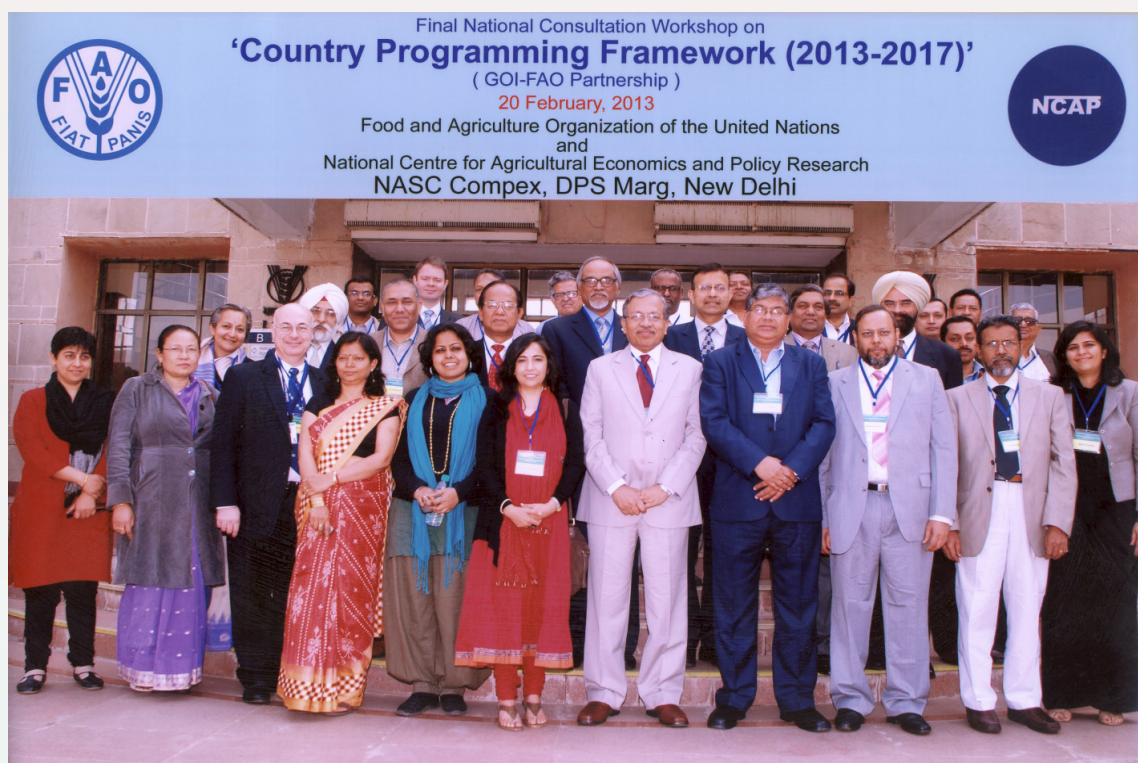
1. Repository and sharing of knowledge: On various aspects related to agriculture (crop management, natural resources etc.), at various levels (including local, national and international levels). It includes community levels community wisdom as well.
2. Policy advocacy role: On various aspects including seeds, pesticides, markets etc, based on evidences. It has got a re-engineering role.
3. Surveillance: It is very important aspect in view of climate change and emerging challenges. As India is a large country with many agro-climates, the surveillance needs

to factor in this aspect. Focus needs to be at regional level.

4. Rain fed agriculture: Food and nutritional security issues.
5. Neglected sections and areas: This includes whole of north east, socially excluded and disadvantaged, women, etc. This involves a large number of policy issues.
6. Enabling states, districts and various decentralized levels: The strategy is to run pilots. Pilots have to be initiated and test for its convergence.

Also suggested three cross cutting areas, which include

1. Water management: to cater to various locations specific problems.
2. Institutional intervention: At grass root level including groups, co-operatives, companies etc. and federate them.
3. Skill development



Participants of the Consultation Workshop on Country Programming Framework

IV. AWARDS/ RECOGNITIONS

Ramesh Chand

- Fellow, Indian Society of Agricultural Economics (ISAE), Mumbai.
- Coordination Committee for Organization of Studies (CCOS) in the field of Agricultural Economics, Department of Agriculture and Co-operation, Ministry of Agriculture, Government of India



Prof. Ramesh Chand, Director NCAP receiving Fellow ISAE Award from Dr. C. Ramasamy, President, ISAE

- Constitution of the Technical Committee 19th Quinquennial Livestock Census 2010, Ministry of Agriculture, Department of Animal Husbandry, Dairying & Fisheries
 - Issues related to the Research and Development (R&D) in Agriculture sector, With reference to Prime Minister's Office, committee constituted by ICAR
 - Member of the Board of Studies of the Faculty of Economics (FE), South Asian University, South Asian University, New Delhi
 - **Working Group** on Linking Farmers to Market in Haryana, Haryana KisanAyog
 - Committee to Formulate Long Term State Agriculture Policy, Constituted by Governor of Punjab, Govt. of Punjab
 - Agricultural Expert Advisory Committee for U.P, U.P. Government, Lucknow
 - Focal Point for the Agricultural Market Information System (AMIS), Ministry of Agriculture, Department of Agriculture & Cooperation
 - Member of the **Steering Committee** and the Core Working Group for the development of Strategy and Strategic Plan 2010-15 of the DARE/ICAR and for pursuing the Performance Monitoring and Evaluation System including the Results Framework Documents (RFD), ICAR
 - Management Committee of NAARM for three years from 29.05.2011, ICAR
 - O&M programme Committee (O&MPC) under the NAIP, ICAR
 - **Steering Committee** to oversee the development, follow-up action on the
- Appointment of Dr. Ramesh Chand, Director NCAP as Nodal Officer for SAARC matter and Member of GB SAIC, Ministry of Agriculture, Government of India
 - Setting up of Expert Group for implementation of NREGA on a watershed platform under Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), Ministry of Rural Development
 - Enhancement of Storage Capacity in the country and to monitor creation of additional storage space for storing Central stock of foodgrains, Ministry of Consumer Affairs, Food & Public Distribution

initiative declared in Ministerial declaration at G-20, ICAR

- Advisory Committee on “Agricultural Outlook and Situation Analysis Reports with Focus on Food Security”, *National Council of Applied Economic Research, New Delhi*.
- DARE/ICAR for coordination between the two Departments for service on “Information on Marketing Infrastructure”, DARE, ICAR
- Life member, *Institute for Social and Economic Change, Bangalore*.

P. S. Birthal

- Managing Editor: *Agricultural Economics Research Review*.
- Member, Quinquennial Review Team for the *Indian Institute of Soil Science, Bhopal*.
- Member, Quinquennial Review Team for the AICRP on Nematodes; *Indian Agricultural Research Institute, New Delhi*.
- Member, Research Advisory Committee of the *National Centre for Integrated Pest Management, New Delhi*.
- Member, Planning Board of the *Tamil Nadu Veterinary and Animal Science University, Chennai*.

S. S. Raju

- Member, Quinquennial Review Team (QRT), *National Research Centre for Agroforestry, Jhansi and AICRP on Agroforestry*.
- Member, Research Advisory Committee (RAC), *National Institute of Animal Nutrition and Physiology, Bangalore*
- Member, Editorial Board, *SAARC Journal of Agriculture, Dhaka, Bangladesh*
- Dr. R. T. Doshi Foundation award (First Prize) for best paper (co-authored) published in *Agricultural Economics Research Review* in the year 2011.

Raka Saxena

- Raka Saxena, Smita Sirohi, Kavita Pal and Punit Kumar (2012) “भारत में असंगठित डेरी संगठनों की संरचना, आगत आपूर्ति प्रणाली एवं समस्याएँ” Poster Presentation on Hindi Divas (14 September, 2012). This poster was awarded First Prize (Best Poster Award).

P. Shinoj

- R.T. Doshi award for best research paper (co-authored) published in the journal *Agricultural Economics Research Review* during the year 2011.

V. PUBLICATIONS

A. Policy Paper

Raju, S. S., Shinoj Parappurathu, Ramesh, Chand, P. K., Joshi, Praduman, Kumar and Siwa, Msangi (2012). *Biofuel in India: Potential, Policy and Emerging Paradigms*, Policy Paper No. 27, NCAP, New Delhi.

B. Research Paper

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Kumar, Anjani., M. C. S. Bantilan, Praduman Kumar, Sant Kumar and Shiv Jee. 2012. Food security in India: Trends, patterns and determinants. *Indian Journal of Agricultural Economics* (Conference Issue), 67(3): 445-463.

P. Ramasundaram and S. Vennila. 2013. A Decade of Bt Cotton experience in India: Pointers to transgenics in Pipeline. *Current Science*, 104 (6): 697-698.

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E. TV Talks/Radio Talks

Chand, Ramesh. 2012. Discussion on Agricultural export restriction in Samachar Plus, DD News, April 30, 2012.

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F. Presentations in Conferences/Workshops/Symposia

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- Mrinmoy Ray, Ramasubramanian V., Amrender Kumar and P. Ramasundaram. 2012. Time-series intervention modeling for forecasting cotton yield in India, presented in the International Conference on Statistics and Informatics in Agricultural Research & the 66th Annual Conference of Indian Society of Agricultural Statistics at IASRI, New Delhi during 18-20, December 2012.
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- Raju, S. S. 2012. Key policy issues for biofuels in India. In: *Policy Dissemination Workshop on Biofuels and the Poor*, organized by IFPRI, Washington D.C. and NCAP, New Delhi. 19 April.
- Shinoj Parappurathu, Background paper on crops and livestock for Kerala. Paper presented at 'Workshop on Kerala Perspective Plan 2030' on 3rd August, 2012 at Institute of Management in Government, Thiruvananthapuram, Kerala.
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agricultural production: The case of cotton in India” Statistics and Informatics in Agricultural Research during 9-11 October 2012.

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G. Monograph

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I. Books

T. E. Sheeja, V. A. Parthasarthy, Sajesh V. K. and P. R. Rahul. 2012. Intellectual property

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J. Abstract

Ahuja Usha Rani, Rajni Jain, Anjani Kumar, Dharminder Choudhary and Amarjeet Singh, 2012. Assessing women’s empowerment in diverse farming systems of Eastern India: Gender equity index. *Journal of Indian Society of Agricultural Statistics (Conference)*, pp. 9.

Ahuja Usha Rani, Rajni Jain, Sonia Chauhan, Amarjit Singh, Prem Narayan and Khayali Ram Chaudhary. 2012. Socio-economic impact of mobile phone in agriculture: A case study of Karnal district. *Journal of Indian Society of Agricultural Statistics (Conference)*, pp. 117.

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VI. ON-GOING RESEARCH PROJECTS

Sl. No.	Title of Research Project	PI / Co-PI
<i>Institute Funded</i>		
1.	Terms of Trade, Agricultural Growth and Farmers' Income in India	Raka Saxena Ramesh Chand
2.	The Rise of Supermarket Chains in India: Effects on Farmers, Traditional Retailers and Local Vendors	M. B. Dastagiri
3.	Performance Assessment of Krishi Vigyan Kendras	Sajesh V. K.
4.	Research Priorities in Indian Agriculture	Sant Kumar
5.	Sustainability and Efficiency in Agriculture: An Exploratory Analysis	Suresh A. Kurup
6.	Under nourishment in India: Comparing Alternative Norms and Assessing the Income Effect	Jaya Jumrani Ramesh Chand
<i>NAIP Funded</i>		
7.	Achieving Improved Livelihood Security through Resource Conservation and Diversified Farming Systems in Mewat	Usha Rani Ahuja
8.	Risk Assessment and Insurance Products for Agriculture	S. S. Raju Diana S. Rajni Jain
9.	Developing a Decision Support System for Commodity Market Outlook	Anjani Kumar Rajni Jain Shiv Kumar P. Shinoj
10.	Visioning, Policy Analysis and Gender (V-PAGE)	Ramesh Chand P. Ramasundaram Sant Kumar Suresh A. Kurup B. Ganesh Kumar Josily Samuel Sajesh V. K.
<i>Other Projects</i>		
11.	Enhancing Resilience of Agriculture to Climate Change through Technologies, Institutions and Policies (Funded by National Initiatives on Climate Resilient Agriculture)	P. S. Birthal Suresh A. Kurup Shiv Kumar
12.	Tracking Change in Rural Poverty in Household and Village Economies in South Asia (funded by ICRISAT)	Ramesh Chand Usha Rani Ahuja Rajni Jain P. Shinoj
13.	Strengthening Value Chain for Economic Efficiency: The Case of Small Ruminant Meat Marketing In India (funded by ICAR)	Suresh A. Kurup
14.	Agricultural Value Chain Financing in India	Ramesh Chand P. S. Birthal Raka Saxena



VII. CONSULTANCY RESEARCH PROJECTS

Name of scientist	Institution to which consultancy is provided	Area of consultancy / contract research
S. S. Raju	SAARC Agriculture Centre (SAC), Dhaka, Bangladesh	Assessment of diversity of veterinary services (public and private sector) in India
P. S. Birthal	International Food Policy Research Institute (IFPRI), Washington DC.	Patterns and Sources of Growth in Indian Agriculture
P. Shinoj	Govt. of Kerala sub-contracted through NCAER, New Delhi	Kerala Perspective Plan – Agricultural and Allied Sector in Kerala' for State Planning Board
Ramesh Chand P. Ramasundaram Usha Rani Ahuja Sajesh V. K.	Standing Panel on Impact Assessment (SPIA) of the CGIAR Independent Science and Partnership Council, FAO, viale Terme di Caracalla, Rome, ITALY	Assessing the adoption pattern of chick pea (<i>Cicerarietinum L.</i>) varieties in Madhya Pradesh
Suresh A. Kurup	National Council for Applied Economic Research (NCAER)	Rural Infrastructure in Kerala: Water Development



VIII. RESEARCH ADVISORY COMMITTEE (RAC)

The Research Advisory Committee (RAC) of the National Centre for Agricultural Economics and Policy Research (NCAP) was constituted for a period of three years w.e.f. 30 September 2010. The composition of RAC is as follows:

Dr. V. S. Vyas (*Chairman*)

Professor Emeritus and Chairman
Institute of Development Studies
396, Vasundhara Extension
Gopal Pura Bye Pass, Tonk Road
Jaipur-302 018, Rajasthan

Dr. Ramesh Chand

Director
National Centre for Economics and Policy
Research (NCAP),
Pusa, New Delhi-110 012

Dr. Mruthyunjaya

Former National Director
NAIPA-701, Vasundhara Apartment
Sector-6, Plot No. 16, Dwarka
New Delhi-110 045

Dr. (Ms) Amita Shah

Director
Gujarat Institute of Development Research
(GIDR) Gota
Ahmedabad-380 060, Gujarat

Prof. V. P. S. Arora

Dean
RICS School of Built Environment
Block-F2, First Floor
Amity University
Sector -125
Noida -201313, Uttar Pradesh

Dr. J. V. Meenakshi

Professor
Delhi School of Economics
University of Delhi
Delhi-110 007

Dr. R. K. Mittal

Assistant Director General (EQR)
Education Division
ICAR, Krishi Anusandhan Bhawan-II
New Delhi-110 012

Dr. P. Ramasundaram (*Member Secretary*)

Principal Scientist
National Centre for Agricultural Economics
and Policy Research
Pusa, New Delhi-110 012

Meetings of the Institute Research Council (IRC)

Seven meetings of the IRC were held during 2012-13 (April-March). In the IRC meetings, deliberations were made on the progress of on-going projects, new research proposals and deputations to foreign countries.



IX. MANAGEMENT COMMITTEE

Dr. Ramesh Chand

Director
National Centre for Agricultural Economics
and Policy Research (NCAP)
New Delhi - 110 012

Director

Directorate of Economics & Statistics
Delhi State, Old Secretariat
Delhi - 110 054

Economic Advisor

Economic & Statistical
Organization Govt. of Punjab
Chandigarh - 160 017

Dr. R. K. Khatkar

Head
Department of Agriculture Economics
Haryana Agricultural University
Hissar, Haryana - 125 004

Sh. Viswasrao Anandrao Patil

P.O. Lohara, Taluq Pachora
Distt. Jalgaon Maharashtra

Dr. H. K. Srikanta

59/1, 8th Cross, 5th Main R.K. Layout
Padmanabhanagar, Bangalore
Karnataka

Dr. S. L. Goswami

Director
National Academy of Agricultural
Research Management
Rajendra Nagar, Hyderabad - 500 030
Andhra Pradesh

Dr. N. H. Rao

Joint Director
National Academy of Agricultural Research
Management, Hyderabad - 500 030
Andhra Pradesh

Dr. (Ms.) Sudha Mysore

Principal Scientist
(Agril. Economics)
Indian Institute of Horticultural Research
Hessaraghatta Lake Post, Bangluru,
Karnataka - 560 089

Dr. A. K. Vashist

Assistant Director General
PIM ICAR, Krishi Bhawan
New Delhi - 110 001

Assistant Director General (EQR)

Indian Council of Agricultural Research
Krishi Anusandhan Bhawan-II
Pusa, New Delhi - 110 012

Sr. Finance and Accounts Officer

National Bureau of Plant Genetic Resources
Pusa, New Delhi - 110 012

Administrative Officer (Member Secretary)

National Centre for Agricultural Economics
and Policy Research
DPS Marg, Pusa, New Delhi - 110012

X. NCAP COMMITTEES

A number of committees (as mandated by ICAR and internal) have been constituted for the decentralised management of the Centre. These committees and their terms of reference are as follows:

Academic Planning and Policy Committee

- discuss theme area membership
- strengthen internal planning and functioning and provide policy directions
- suggest steps for strengthening NCAP

Priority Setting, Monitoring and Evaluation Cell (PME Cell)

- plan, promote and monitor PME activities of the Centre
- report the progress of PME activities
- maintain and update RPF of all the scientists and projects
- prepare quarterly and half yearly progress reports of scientists and NCAP
- update Institute profile

Budget and Results Framework Document (RFD) Committee

- plan, review and monitor expenditure and resource generation including those for sponsored projects
- ensure compliance of proper procedures
- undertake activities related to RFD

Publication Committee

- plan, format and make recommendations regarding Centre's publications
- prepare guidelines for and arrange internal and external reviews and coordinate revisions

- help and advise younger faculty on publication-related matters

Purchase Committee

- purchase material and services according to the prescribed official procedure and in accordance with the Budget Committee guidelines/directions on utilisation of funds (Chairman of the Committee will also be the Store Advisor). The Committee will undertake stock verification as per ICAR requirement on priority basis.

Security Committee

- develop an effective security system for the Centre
- identify an efficient and effective security firm
- monitor the security staff regularly

Annual Report Committee

- collect material from scientists/office for inclusion in Annual Report
- edit the report and initiate process for its publication

Consultancy Processing Cell

- examine the proposals related to consultancy with reference to guidelines of the Council issued from time to time and recommend appropriate action

Maintenance and Landscape Committee

- monitor maintenance of the office building and the landscape; and take suitable action for improving/rectifying problems
- suggest innovative ideas for improving the office, utilities and landscape

- The committee will meet the Director on last working day of every month to review the status.

Women Cell

- recommend measures for the welfare of the women employees; and redress their grievances including those related to sexual harassment, if any.

Grievance Cell

- examine the grievances received and to suggest follow-up actions accordingly

Official Language Committee

- monitor the progress of work done in official language from time to time and suggest relevant programs for improvement
- organise *Raj Bhasha Week/Day*, as intimated by the Council from time to time
- report to the Council and other agencies on progress from time to time
- Propose ways of increasing use of *Raj Bhasha* in the Centre

Agricultural Knowledge Management Unit (AKMU)

- plan and monitor AKMU related activities
- prepare plan for computer and software upgradation for the Centre
- plan for effective virus control system
- propose effective maintenance plan for the Centre's computers
- monitor, improve and update Centre's website

Library Committee

- plan for procurement of books, journals and other publications
- improve library environment so as to make its effective use

- plan for library modernisation
- share Center's publications with partners and stakeholders

Deputation Committee

- to consider all proposals for foreign visits of the Scientists for approval

Transport Committee

- develop an effective system of meeting the vehicle requirement for official activities
- arrange vehicles for research and official activities
- guide/suggest maintenance of official vehicles

IPR and Technology Commercialisation Committee

- take up issues related to IPR of products developed for commercialisation
- develop conditions for commercialisation of products
- suggest ways for resource generation

Staff Recreation Committee

- plan indoor and outdoor recreational activities for the staff of the Centre
- organise recreational activities for the staff of NCAP

Seminar/IRC

- organise IRC/seminars
- ensure projection and other logistics at the venue of the seminars and IRCs

Office Services Committee

- look after office cleanliness and hygiene
- arrange communication and delivery of internal and external papers, mail
- ensure satisfactory office services

XI. PARTICIPATION IN SCIENTIFIC ACTIVITIES

Ramesh Chand

- Nominated by DAC in the delegation for Vice-Ministerial meeting of G-20 Countries in Mexico during April 11-13, 2012.
- Chaired the meeting of Project Advisory Committee of VDSA Project, in RCER, Patna on April 22, 2012.
- Made presentation on “Regional Integration in Agriculture: Role of India” in Stakeholder Consultation on “Potential Regional Trade in Agriculture in South Asia” under the ADB-ComSec-UNTAD Project on “Development-Oriented Integration in South Asia” organized by the UNCTAD Geneva and Common Wealth Secretariat in collaboration with SANEM, on May 28, 2012 at Dhaka.
- Participated in ICRIER-FGI Workshop on Growth Models and Policy Processes in India and China on June 22, 2012 at Indian Habitat Centre, New Delhi.
- Attended a Regional Dialogue on “Prioritizing Demand-driven Agricultural Research for Development in South Asia” organized by APAARI and IFPRI held on July 2, 2012 at NASC, New Delhi.
- Attended a Seminar on “Feeding 1.3 billion: Role of Incentives and Technology in Chinese Agriculture by Dr. Huang Jikun, Director, Centre for Chinese Agricultural Policy (CCAP, Beijing)” on July 4, 2012 at New Delhi.
- Participated as a Speaker in project Launch Workshop on “Capturing the Potential for Greenhouse Gas Offsets in Indian Agriculture” in Panel Discussion on How Can Carbon Credits Benefit Agriculture and Allied Sectors, organized by NCAER on July 10, 2012 at New Delhi.
- Co-Chaired the session in National Advisory Council Consultation of the Working Group on Enhancing Farm Income for Small Holders by Market Integration, August 3, 2012 at NCAP, New Delhi.
- Attended Knowledge Meet Meeting of AU Vice-Chancellors and ICAR Directors on August 21-22, 2012 at NASC, New Delhi.
- Chaired four meetings of Working Group, set up by Haryana Kisan Ayog on “Linking Farmers to Market in Haryana”, in various months.
- Made a Presentation in Brainstorming Meeting on Pulses Production on the theme Policy Initiatives Possible Options to drive Pulses Value Chain under the Chairmanship of Hon’ble Agricultural Minister on September 12, 2012 at NAAS, New Delhi.
- Participated in the VDSA Harmonization workshop at ICRISAT, Hyderabad on September 13, 2012.
- Participated in the High Level Regional Consultation on Policies to respond to High Food Prices in Asia and Pacific region in Bangkok with the Agriculture Minister of India, on September 24, 2012, New Delhi.
- Attended First meeting of the Joint Working Group under the India-Australia MoU on Agricultural Cooperation on September 26, 2012, New Delhi
- Chairman for the Technical Session on Inputs Delivery and Markets in 20th Annual Conference and Silver Jubilee of the

Agricultural Economics Research Association (India) during October 9-11, 2012 at New Delhi.

- Lead Presentation on Food Security and Sustainable Agriculture : Policy Options for South and South-West Asian Countries in High Level Policy Dialogue on Regional Cooperation and Inclusive Development in South and South-West Asia, ESCAP, October 18-19, 2012 at New Delhi.
- Presented paper in the Second Global Conference on Agricultural Research for Development (GCARD2) from 29th October – 1st November, 2012 at Punte Del Este, Uruguay.
- Participated in Third Annual Review Meeting of ICAR – ICRISAT collaborative project on Village Dynamics Studies in South Asia (VDSA) from 06-08 November, 2012 at ICRISAT, Hyderabad.
- Keynote paper on Food and Nutrition Security in the Annual Conference of the Indian Society of Agricultural Economics, November 16-18, 2012.
- Co-chaired Technical Session on Socio-Economic Issues and Livelihood Security in Third International Agronomy Congress, Agriculture Diversification, Climate Change Management and Livelihoods during November 26-30, 2012, New Delhi.
- Planery Lecture in International Conference on Sustainable Agriculture for Food and Livelihood Security being organized by PAU, Ludhiana on its Golden Jubilee from, November 27-29, 2012.
- Presented a paper on 'Agricultural Trade and Food Security' in a Seminar on "Economic Growth, Trade and Poverty" at Institute for Social and Economic Change (ISEC), Bangalore, 6-7 December, 2012.
- Participated and made a presentation in Sensitization meeting of Scientist In-Charges for all PME Cells of ICAR, NDRI, Karnal on December 8, 2012.
- Presentation on 'Temporal and Spatial Variations in agricultural growth and its determinants' in The Nehru Memorial Museum and Library, on December 14, 2012, New Delhi.
- Co-chaired the Inaugural Session and also delivered on the topic Trends in Labour Markets: What the Data Reveals Moderator in the Policy Dialogue on "Rural Labor Markets and Agriculture" at ICRISAT, Hyderabad, on January 17, 2013.
- Delivered a lecture on Role and Effects of Agricultural Subsidies in India in NAAS, New Delhi.
- Participated in a Panel Discussion on Agriculture Education in Technical Session II (Plenary) in XI Agricultural Sciences Congress at Orissa University of Agriculture & Technology, Bhubaneswar, Odisha, 7-9 February, 2013.
- Represented India in the Seventh Meeting of the Technical Committee on Agriculture and Rural Development (TCARD) during February 10-11, 2013 at Dhaka, Bangladesh.
- AMIS (Agricultural Market Information System) Meeting of Rapid Response Forum of G 20 and USDA Outlook Forum, 20-22 February, 2013, Washington DC USA.
- Participated and made a Presentation in National Workshop on "Foresight and Future Pathways of Agricultural Research through Youth in India" organized by ICAR, New Delhi, during March 1-2, 2013.
- Conference Lecture on "Outlook for Indian Agriculture and Food Demand, and Panelist on "Future on Plate", in Australia Bureau of Agricultural and Resource Economics and Sciences (ABARES) Agriculture Outlook Conference 2013, March 5-6, 2013, Canberra, Australia.



Prof. Ramesh Chand, Director NCAP addressing the delegates of ABARES Outlook Conference 2013, Canberra

Available on <http://www.youtube.com/user/AbaresOutlook2013?feature=watch>

- Participated in the Advisory Committee and Academic Meetings of Agricultural Development and Rural Transformation Centre (ADRT), Institute for Social and Economic Change (ISEC) Bangalore, on March 22, 2013.

P. Ramasundaram

- National Workshop on “Agriculture R&D Policy: The Case of IPM and Pulses in India”, NISTADS, New Delhi on 08 June 2012
- National Conference on “10 years of Bt cotton in India - A Review”, at India International Centre, New Delhi organized by Council for Social Development on 11-12 June 2012.
- 20th Annual Conference and Silver Jubilee of The Agricultural Economics Research Association on Agricultural Inputs and Services Delivery System for Accelerating Growth and Poverty Reduction on 9-11 October 2012.

P. S. Birthal

- Participated in the 5th Indian Horticulture Congress held at Punjab Agricultural

University, Ludhiana, and organized by the Indian Horticulture Society. November 6-9, 2012.

- Participated in the 72nd Annual Conference of the Indian Society of Agricultural Economics, held at Banaras Hindu University, November 17-19, 2012.
- Participated in the 3rd International Agronomy Congress held at Indian Agricultural Research Institute, New Delhi and organized by Indian Society of Agronomy, November 26-30, 2012.
- Participated in the 20th Annual Conference of the Agricultural Economics Research Association held at IARI, New Delhi, October 9-11, 2012.
- Participated in the National Seminar on “New paradigms in livestock production: From traditional to commercial farming and beyond” held at National Dairy Research Institute, Karnal on January 28-30, 2013.

Usha Rani Ahuja

- Harmonization workshop of VDSA, ICRISAT, Hyderabad. 6-7 September 2012.
- 3rd Annual Review Meeting of VDSA, ICRISAT, Hyderabad. 6-9 November 2012.
- 20th AERA Conference, IARI, New Delhi. 28-30 November 2012.
- International Conference on statistics and Informatics in Agricultural Research, IASRI, New Delhi. 18-20 December 2012.
- Consortium Implementation Committee (CIC) meeting of NAIP sub project on Achieving Improved Livelihood Security through Resource Conservation and Diversified Farming System Approach in Mewat, Village Pinangawa, Nuh, Mewat. 16 January 2013-06-13.

S. S. Raju

- Stakeholder Consultations (Academic) for Formulation of ADB's Country Partnership Strategy, ADB, New Delhi. 22 May 2012.
- AERA Conference on Agricultural Inputs and Services Delivery System for Accelerating Growth and Improving Farm Income, IARI, New Delhi. 9-11 October 2012.
- FAO National Workshop for the Preparation of Country Programming Framework, NCAP, New Delhi. 20 November 2012.
- FAO final National Consultation workshop on Country Programming Framework 2013-2017, NCAP, New Delhi. 20 February 2013
- Community-based Insurance in Agriculture: Conceptualization and Institutionalization of the Processes, IFPRI, New Delhi. 12 March 2013.

M. B. Dastagiri

- A workshop "Agricultural R&D Policy: the case of IPM and Pulses in India" NCAP organized in collaboration with NISTADS, New Delhi. 8 June 2012.
- A Paper presented in the International Conference on Agriculture and Horticulture Sciences held at Hyderabad, Organized by OMICS Groups, USA. 14-15 Sept, 2012.
- The Union Budget 2013-14: Reform and Development Perspectives, Organized By CPR, ICRIER, IDF, NCAER, and NIPFP-IDF Le Méridien, Windsor Palace, Janpath, New Delhi. 2 March, 2013.

Rajni Jain

- Kisan Divas and Farmer's Training, organized by NCAP, Inai, Darbhanga, Bihar. 24 April, 2012.
- Completion Workshop and Nodal Officers Workshop-cum-Installation Training for NAIP Consortium Strengthening Statistical

Computing for NARS, IASRI, New Delhi. 25-26 June 2012.

- Brainstorming session on MIS module ICAR's FMS project, IASRI, New Delhi. 6 August, 2012.
- 20th AERA Conference, IARI, New Delhi. 9-11 November, 2012.
- 72nd ISAE Annual Conference, BHU, Varanasi. 17-18, November, 2012.
- Tackling Agriculture -Nutrition Disconnect in India – Phase II, Inception Workshop, IGIDR, Mumbai. 19th November 2012.
- International conference on statistics and informatics in agricultural research, IASRI, New Delhi. 18-20 December, 2012.
- Indo-Australia Bilateral Project Workshop "Using leading edge ICT to enhance Australian and Indian ground water and land resources under climate change scenarios", International Water Management Institute (IWMI), Patancheru. 21-24 January, 2013.
- 7th National Conference on Computing for Nation Development, Bharati Vidyapeeth's Institute of Computer Applications and Management (BVICAM), New Delhi. 7-8 March, 2013.

Sant Kumar

- 20th Annual Conference and Silver Jubilee of AERA on Agricultural Inputs and Services Delivery System for Accelerating Growth and Improving Farm Income, IARI, New Delhi 9-11 October 2012.
- 72nd Annual Conference of the Indian Society of Agricultural Economics, BHU, Varanasi, 17-19 November 2012.

Suresh A. Kurup

- Participated in the 20th Annual Conference of Agricultural Economics Research Association, organised out at Indian

Agricultural Research Institute during 9-11 October 2012.

- Participated in the International Conference on “Statistics and Informatics in Agricultural Research” during 18-20 December 2012, at New Delhi.
- Attended the National Consultation Workshop of FAO on Country Programming Framework (CPF), during November 2012 and February 2013, organised at NCAP, New Delhi and NASC Campus, New Delhi, respectively. Also acted as in both the workshops.

Shinoj Parappurathu

- Policy Dialogue Workshop on ‘Priorities and Possibilities of Investment for Accelerating Growth and Reducing Poverty in Odisha’ organized under the project ‘Village Dynamics in South Asia’ on 6th July, 2012 at Hotel Suryansh, Bhubaneswar.
- Seminar on Kerala Perspective Plan 2030, organised during 10-12, National Council for Applied Economic Research, New Delhi.
- 20th Annual and Silver Jubilee Conference of Agricultural Economics Research Association (AERA) during 9-11 October, 2012 at IARI, New Delhi.

Sajesh V. K.

- Agricultural R&D Policy: The Case of IPM and Pulses in India, 8 June 2012, NISTADS, New Delhi.
- 20th Annual Conference of Agricultural Economics Research Association, 9-11 October 2012, IARI, New Delhi.

Pavithra S.

- Author Workshop by SPRINGER on ‘How to Write for and Get Published in Journals’ on 25th January, 2013 at IGNOU, New Delhi.
- Foresight and Future Pathways of Agricultural Research through Youth in India, 1-2 March 2013 at NASC Complex, New Delhi.

Jaya Jumrani

- Conference on “Perspectives On Indian Economic Development and Policy” in memory of Prof. Suresh D. Tendulkar, Department of Economics, Delhi School of Economics, University of Delhi, July 19-20, 2012.
- Author Workshop on “How to Write for and Get Published in Scientific Journals”, organized by Springer at the Indira Gandhi National Open University, New Delhi, January 25, 2013.

Kingsly Immanuelraj T.

- “Agricultural R&D Policy: the case of IPM and Pulses in India” organized by NCAP in collaboration with NISTADS, New Delhi, 8 June 2012.
- 20th Annual Conference of the Agricultural Economics Research Association at IARI, New Delhi, 9-11 October 2012.
- “The Union Budget 2013-14: Reform and Development Perspectives” organized by CPR, ICRIER, IDF, NCAER, and NIPFP-IDF, at New Delhi, 2 March 2013.

XII. VISITS ABROAD

Name of Scientist	Purpose	Place	Duration
Ramesh Chand	Presentation on “Regional Integration on Agriculture : Role of India” in Stakeholder Consultation on “Potential Regional Trade in Agriculture in South Asia” under the ADB-ComSec-UNTAD Project on “Development-Oriented Integration in South Asia” organized by the UNCTAD Geneva and Common Wealth Secretariat.	Dhaka, Bangladesh	28 May 2012
	6 th Meeting of the Governing Board of SAARC Agriculture Centre (SAC).	Dhaka, Bangladesh	3-4 September, 2012
	Attended the Second Global conference on Agricultural Research for Development (GCARD2).	Punte Del Este, Uruguay	29 October - 1 November, 2012
	Participated in the Seventh Meeting of the Technical Committee on Agriculture and Rural Development (TCARD).	Dhaka, Bangladesh	10-11 February, 2013
	AMIS (Agricultural Market Information System) Meeting of Rapid Response Forum of G20 and USDA Outlook Forum.	Washington DC USA	20-22 February, 2013
	ABARES Outlook Conference, 2013.	Canberra, Australia	5-6 March, 2013
S. S. Raju	Consultation meeting on “Assessment of Diversity of Veterinary Services (Public and Private) in SAARC counties	Islamabad, Pakistan	17-18 July, 2012



XIII. CAPACITY BUILDING ACTIVITIES

Other Meetings/ Trainings Organised

One-day policy dissemination workshop on “Biofuels and the Poor” 19 April 2012	NCAP, New Delhi
5 th Prof. Dayanatha Jha Memorial Lecture “Agricultural Prices and Markets: The Most Contested Issues” by Prof. R. S. Deshpande. 2 May, 2012	NCAP, New Delhi
One day seminar on “Possibility of Investment for Accelerating Agricultural Growth and Reducing Poverty”. 6 July, 2012	NCAP New Delhi and DWM Bhubaneswar
Training programme on Field Survey, Electronic Compilation and Analysis of Data, ICAR-ICRISAT project, Tracking Change in Rural Poverty in Household and Village Economies in South Asia. 21-28 July, 2012	NCAP, New Delhi
Training programme “Core issues in the agricultural sector” for the officers of the Indian Economic Service funded by the Ministry of Finance, Government of India. 22-26 October 2012	NCAP, New Delhi
National workshop for the Preparation of Country Programming Framework. FAO India and DAC, GOI. 20 November 2012	NCAP, New Delhi
One-week training programme “Core issues in the agricultural sector” for the probationers of the Indian Economic Service’ funded by the Ministry of Finance, Government of India. 24-28 December 2012	NCAP, New Delhi
6 th Meeting of Research Advisory Committee of NCAP 9 July 2012	NCAP, New Delhi
24 th Meeting of Institute Management Committee of NCAP 1 March 2013	NCAP, New Delhi



XIV. LECTURES DELIVERED BY NCAP SCIENTISTS

Name of Scientist	Topic and Date	Venue
Ramesh Chand	"System Level Performance Assessment of NARS" in Training Workshop on "Technology Forecasting methods with application in Agriculture" 13 June 2012	IASRI, New Delhi
	"Policy and Priority Setting in Agricultural Research" in Executive Development Programme on Leadership Development. 5 June, 2012	NAARM, Hyderabad
	Keynote address in one day seminar on "Growth and Development of Agriculture in Karnataka: Prospects and Strategies" 7 June, 2012	ISEC, Bangalore
	Keynote address "Managing Land Resources for Sustainable Agriculture" 12-13 October, 2012	NBSS&LUP, Nagpur
	Delivered a talk in the Session on "Export Potential of Indian Agriculture Products to ASEAN" in Symposium on Indo-ASEAN Export Potential of Agriculture Products. 18 October, 2012	NASC, New Delhi
	"Impact Assessment of Agricultural Research" 14 September, 2012	NAARM, Hyderabad
	"Impact of XII Plan on Rural Livelihood" in Training programme on Field Survey, Electronic Compilation and Analysis of Data, ICAR-ICRISAT project, Tracking Change in Rural Poverty in Household and Village Economies in South Asia. 21-28 July, 2012	NCAP, New Delhi
	"Role and Effects of Agricultural Subsidies in India" 22 October, 2012	NAAS, New Delhi
	"Agricultural Issues and Concerns for the XIIth Five Year Plan" in Indian Economic Services (IES), Cadre Officers (Junior Time Scale), on Core Issues Related to Agricultural Sector 22 October, 2012	NCAP, New Delhi
	"Agricultural Growth, Prices and Food Security" in Indian Economic Services (IES), Cadre Officers (Junior Time Scale), on Core Issues Related to Agricultural Sector 23 October, 2012	NCAP, New Delhi
	"Foodgrain Management and Food Security" in Indian Economic Services (IES), Cadre Officers (Junior Time Scale), on Core Issues Related to Agricultural Sector 25 October, 2012	NCAP, New Delhi
	"Globalization and Regional Trade in Agriculture" in Indian Economic Services (IES), Cadre Officers (Junior Time Scale), on Core Issues Related to Agricultural Sector 26 October, 2012	NCAP, New Delhi

Name of Scientist	Topic and Date	Venue
	"Agricultural Issues and Concerns for the XIIth Five Year Plan" in the Training Course for Officer Trainees of the Indian Economic Services (IES), on Core Issues Related to Agricultural Sector 24 December 2012	NCAP, New Delhi
	"Globalization and Regional Trade in Agriculture" in the Training Course for Officer Trainees of the Indian Economic Services (IES), on Core Issues Related to Agricultural Sector 28 December, 2012	NCAP, New Delhi
	"Agricultural Growth, Prices and Food Security" in the Training Course for Officer Trainees of the Indian Economic Services (IES), on Core Issues Related to Agricultural Sector 28 December, 2012	NCAP, New Delhi
P. S. Birthal	"Linking Farmers to Markets: Institutional innovations" in the 5th Indian Horticulture Congress organized by the Indian Horticulture Society 6-9 November 2012	PAU, Ludhiana
	"Frontier Technologies for Agricultural Development" in the 72nd Annual Conference of the Indian Society of Agricultural Economics. 17-19 November 2012	BHU, Banaras
	"Agricultural Diversification and Smallholders" in the 3rd International Agronomy Congress. Organized by Indian Society of Agronomy. 26-30 November 2012	IARI, New Delhi
	"Strengthening Agricultural Policy Research" in the 20th Annual Conference of the Agricultural Economics Research Association. 9-11 October 2012.	IARI, New Delhi
	"Economic and environmental contribution of livestock in the mixed farming Systems in India" in the National Seminar on "New paradigms in livestock production: From traditional to commercial farming and beyond". 28-30 January 2013	NDRI, Karnal
Usha Rani Ahuja	"Role and Status of Women in Agriculture" to the agricultural students of Opportunity Cell. 26 April 2012	Uday Pratap College of Varansai, Uttar Pradesh
	"Gender Equity in the farm families of Bihar, Jharkhand and Odhisa State of East India" in the training programme on 'field Survey, Electronic Compilation and Analysis of Data ICAR-ICRISAT. 21-28 July 2012.	NCAP, New Delhi
	"ICT in Rural Livelihood" in the training programme on 'field Survey, Electronic Compilation and Analysis of Data ICAR-ICRISAT. 21-28 July 2012.	NCAP, New Delhi
S. S. Raju	"Estimation of Feed and Fodder resources" in the Training programme on Agricultural Research Planning and Impact Assessment 28 August, 2012	IARI, New Delhi

Name of Scientist	Topic and Date	Venue
	"Risk Management in Indian Agriculture" in the Training programme on Agricultural Research Planning and Impact Assessment 1 September 2012	IARI, New Delhi
	"Risks and Risk Management strategies" to the IES officers, undergoing training 26 October, 2012	NCAP, New Delhi
	"Risk and Risk Management strategies" to the IES probationers, undergoing training 28 December, 2012	NCAP, New Delhi
	"Risk Management in Agriculture" to the PG students and faculty of ANGRAU 8 February, 2013	Agricultural College, Bapatla
Rajni Jain	"Researchable issues in Computer Science: Agriculture Domain" for participants of Refresher course in Computer Science 31 July, 2012	Academic Staff College, JNU, New Delhi
	"ETL model for integration of heterogeneous socio-economic databases-Problems and solutions" for participants of Refresher course in Computer Science 31 July, 2012	Academic Staff College, JNU, New Delhi
	"Classification using Decision Trees", CAFT Training participants 25 September, 2012	IASRI, New Delhi
	"Data Management using CMOS", IES Training participants 26 October 2012	NCAP, New Delhi
	"Introduction to VDSA Data" in the Phase II, Inception Workshop on Tackling Agriculture -Nutrition Disconnect in India 19 November, 2012	IGIDR, Mumbai
	"Introduction to data mining", in the Training on Expert system development using Agridaksh 21 February, 2013	IASRI, New Delhi
	"Rule generation using DM", in the Training on Expert system development using Agridaksh 21 February, 2013	IASRI, New Delhi
	"Nut-bolts of Data Mining", in the HRD Training on Data Warehouse and Data Mining 21 March 2013 Dehradun	Indian Council of Forestry Research and Education,
	"Decision Tree Induction", in the HRD Training on Data Warehouse and Data Mining 21 March 2013	Indian Council of Forestry Research and Education, Dehradun
	"Evaluation of Data Mining Techniques", in the HRD Training on Data Warehouse and Data Mining 21 March 2013	Indian Council of Forestry Research and Education, Dehradun
	"Genetic Algorithms", in the HRD Training on Data Warehouse and Data Mining 21 March 2013	Indian Council of Forestry Research and Education, Dehradun



Name of Scientist	Topic and Date	Venue
Suresh A. Kurup	"Technical Efficiency in Agriculture: Assessment approaches", in the dissemination cum training workshop on Technology Forecasting methods with applications in agriculture. 8 June 2012	IASRI, New Delhi
Shinoj Parappurathu	"Agricultural Marketing and Food grain Distribution System in India" for the participants of seven day training program on Field Survey, Electronic Compilation and Analysis of Data 23 July 2012	NCAP, New Delhi
	"Agricultural Outlook Models for Medium- and Long-term Projections" for one week training on IES probationers. 22 October 2012	NCAP, New Delhi
	"Agricultural Commodity Outlook" for the one week training for IES probationers. 26 December 2012	NCAP, New Delhi



XV. DISTINGUISHED VISITORS

- Dr. G. K. Chadha, 2 May, 2012
- Dr. R. S. Paroda, 2 May, 2012
- Dr. Rita Sharma, 3 August, 2012
- Delegates from CHILE, Agric. Engineer, Ivan Ariel Matus Tejos, INIA, Chile, National Institute of Agriculture Research, Chile
- Sergio Rodriguez Royo, Agric. Engineer, P. University Catholic of Chile (PUC) Faculty of Agronomy and Forestry Engineering, Department of Agricultural Economics.
- Gabino Reginato Meza, University of Chile, Faculty of Agronomic Sciences, Department of Agricultural Production.
- Irigaki Hidetoshi, Director General, Industrial Development and Public Policy Department, Japan International cooperation Agency (JICA), Japan, 15 March, 2013.
- Arne Melchior, Senior research Fellow, Department of International Economics, Norwegian Institute of International Affairs, Oslo.
- Arne Dulsrud, Director General, National Institute for Consumer Research, Statens Institute for Forbruksforskning (SIFO), Oslo.



XVI. PERSONNEL

Scientific

Name	Designation	Area(s) of research
Ramesh Chand	Director	Agricultural Growth and Modelling Markets and Trade
P. Ramasundaram	Principal Scientist	Technology Policy
P. S. Birthal	Principal Scientist	Institutional Change Technology Policy Sustainable Agricultural Systems Markets and Trade
Usha Rani Ahuja	Principal Scientist	Institutional Change Technology Policy
S. S. Raju	Principal Scientist	Sustainable Agricultural Systems Institutional Change
Anjani Kumar	Principal Scientist	Markets and Trade Agricultural Growth and Modelling Institutional Change
M. B. Dastagiri	Senior Scientist	Markets and Trade
Rajni Jain	Senior Scientist	Agricultural Growth and Modelling Technology Policy
Sant Kumar	Senior Scientist	Technology Policy Agricultural Growth and Modelling
Shiv Kumar	Senior Scientist	Markets and Trade Institutional Change
P. A. Lakshmi Prasanna	Senior Scientist	Institutional Change
Suresh A Kurup	Senior Scientist	Sustainable Agricultural Systems
Raka Saxena	Senior Scientist	Markets and Trade
Shinoj Parappurathu	Scientist	Markets and Trade
Diana S.	Scientist	Sustainable Agricultural Systems
Sajesh V. K.	Scientist	Institutional Change
Kingsly Immanuel Raj T.	Scientist	Agriculture Growth and Modeling
S. K. Srivastava	Scientist	Agriculture Growth and Modeling
Jaya Jumrani	Scientist	Institutional Change
Pavithra S.	Scientist	Market and Trade

Technical

Name	Designation
Prem Narayan	Technical Officer (T 7-8)
Khyali Ram Chaudhary	Technical Officer (T-6)
Mangal Singh Chauhan	Technical Officer (T-6)
Sonia Chauhan	Technical Officer (T-6)
Satinder Singh	Driver (T-4)

Administrative

Name	Designation
A K Aggarwal (till 23-05-2012)	Administrative Officer
Monisha Banerjee (from 12-06-2012)	Administrative Officer
Vinod Kumar (till 02-12-2012)	Assistant Administrative Officer
S K Yadav (from 03-12-2012)	Assistant Administrative Officer
T A Vishwanath	Assistant Finance & Accounts Officer
Umeeta Ahuja	Private Secretary
Inderjeet Sachdeva	Assistant
Yatin Kohli	Assistant
Lalit Sharma	Assistant
Sandeep Mathur	Assistant
Deepak Tanwar	Junior Stenographer
Sanjay Kumar	Skilled Supporting Staff
Ajay Tanwar	Lower Division Clerk
Mahesh Kumar	S.S. Gr II
Mahesh Pal	S.S. Gr I



XVII. TRAININGS ATTENDED

Name	Topic	Duration	Institution
Ajay Tanwar	Operationalisation of National Pension System (NPS) for Central Autonomous Bodies (CSBs)	01 March 2013	Pitampura, Delhi
	381 st Hindi Workshop	08-12 October 2012	Central Hindi Training Institute, Dett. of Official Language, MHA New Delhi
Lalit Sharma	Operationalisation of National Pension System (NPS) for Central Autonomous Bodies (CSBs)	01 March 2013	Pitampura, Delhi

XVIII. OTHER INFORMATION

NCAP Annual Day

The Centre celebrated its 20th Annual Day on 2 May, 2012. At this occasion, the 5th Dayanatha Jha Memorial Lecture was delivered by Prof. R. S. Deshpande, Director, Institute of Social and Economic Change, Bangalore.



Dr. R. S. Paroda addressing the audience along with Prof. Ramesh Chand, Dr. R. S. Deshpande and Dr G. K. Chadha on the occasion of the 5th Dayanatha Jha Memorial Lecture, at NCAP on 2 May 2012

Promotion of Official Language 2012-13

For the implementation and extensive use of Rajbhasha among the staff of the Centre, a committee on Hindi official language was constituted by Central Rajbhasha Department. The committee monitors the progress of various actions being taken and suggests measures for implementation of official language. It coordinates and helps in executing the council orders and circulars Central Rajbhasha Department, Annual program guidelines and submits the progress reports timely. The Centre organized the monthly staff and quarterly meeting of Rajbhasha and Hindi workshop regularly.

The centre Rajbhasha Sumiti implemented all the guidelines, circulars and instructions issued by Council and Central Rajbhasha Department, Government of India. More than 75 percent noting and drafting in all administrative files were made in Hindi. Around 70 to 75 percent letters were written in Hindi and dispatched outside NCAP to all the regions. The centre published 4 popular research articles and annual report summary in Hindi which were useful to farmers. In addition to these, Rajbhasha Samiti organized workshops for better awareness of computerization, translation and Unicode for Hindi typing during the year.

The Official language committee of NCAP organized a series of events to celebrate “Hindi Week” during 14-21 September, 2012 to generate more awareness among the staff about the use of Hindi. The activities which were organized during the ‘Hindi week’ included essay competition to develop creative writing skill on topics i.e. “भारतीय कृषि में आनुवंशिक रूप से संशोधित फसलों की भूमिका” and debate in Hindi along with live discussion on burning topics like “समाजिक परिवर्तन में सोशल नेटवर्किंग साइट्स की भूमिका: पक्ष/विपक्ष” was also



conducted. The opportunity was given to non-Hindi speakers also to present their views in Hindi on any topic of their interest. Dictation activities related to hindi and English translations of administrative words were also organized to improve the vocabulary in Hindi and English. The quiz competition and *Antakachhari* were arranged for general awareness in Rajbhasha. An overwhelming response was received from NCAP employees in the said events. The Hindi Week ended with poem recitation completion on 21.09.2012.

List of Publications in Hindi

प्रेम नारायण, खरीफ में मूँगफली की फसल में खरपतवार नियंत्रण, 2012 कृषि विस्तार समीक्षा, जुलाई-सितम्बर, 2012।

प्रेम नारायण, उत्तर पूर्वी राज्यों में हरितक्रान्ति के बढ़ते चरण एवं नीतिगत निर्णय, 2012 कृषि विस्तार समीक्षा, अक्टूबर-दिसम्बर 2012।

प्रेम नारायण, (एन. ए. आई. पी.) प्रोजेक्ट वी. पेज वार्षिक प्रतिवेदन, 2012 के कार्यकारी सारांश का हिन्दी रूपान्तरण।

धर्मराज सिंह, अरुण जी., शिवकुमार, अनिलकुमार, एस. पी. भारद्वाज, के. एन. सिंह एवं प्रवीण आर्य. तमिलनाडु में जल उपभोक्ता संस्थाओं में किसानों की सहभागिता एवं इसका नहरी जल उपयोग में दक्षता एवं समानता पर प्रभाव., सांख्यिकी विमर्श पत्रिका 2012-13 IASRI में प्रकाशन हेतु स्वीकृत।

अरुण जी., धर्मराज सिंह, शिवकुमार, अनिल कुमार, व सी आलम, शिवेन्द्र कुमार श्रीवास्तव एवं प्रवीण आर्य, तमिलनाडु में नहरी सिंचाई प्रबंधन में जल उपभोक्ता संस्थाओं के योगदान का आंकलन; कृषि जल पत्रिका, जल संसाधन निर्देशालय, भुवनेश्वर में प्रकाशन हेतु स्वीकृत।

वार्षिक प्रतिवेदन, 2012 राष्ट्रीय कृषि अर्थिकी एवं नीति अनुसंधान केन्द्र, नई दिल्ली।

Sports Report

A small contingent of our centre participated in ICAR Central Zonal Sports Meet held at Indian Agriculture Research Institute (IARI), New Delhi from September during 26-30



September 2012. Ms. Sonia Chauhan bagged 2 Gold Medals in athletics events namely, 100 Mt race and 200 Mt race. In mind game and Chess, Ms. Sonia Chauhan was declared as Winner. Gold medal of Carom competitions was also acquired by Ms. Sonia Chauhan. Being a small institute, NCAP won 4 Gold medals in total. The performance of the Centre was appreciated by Honorable Director General, Dr. S Ayyappan, ICAR during the valedictory ceremony on 30 September, 2012.

Inter-Zonal ICAR Sports Meet was held at IARI during 18-21 January 2013. Ms. Sonia Chauhan and Dr. Usha Ahuja represented our Centre. Ms. Sonia Chauhan acquired the crown of ICAR Women Chess Championship 2012. Dr. Gurbachan Singh, Chairman, ASRB awarded the trophy of ICAR Chess Champion to Ms. Sonia Chauhan during the valedictory function.



Promotions

- Dr. M. B. Dastagiri Sr. Scientist promoted to the post of Principal Scientist under the revised CAS w.e.f. 24-6-2011.
- Dr. (Mrs.) Rajni Jain, Sr. Scientist promoted to the post of Principal Scientist under the revised CAS w.e.f. 2-12-2011.
- Sh. Sushil Kumar Yadav, Assistant, promoted to the post of Assistant Administrative Officer w.e.f. 3-12-2012.

New Joining

- Ms. K. Varalakshmi, joined as Scientist on 6-7-2012.
- Sh. Ganeshagouda, joined as Scientist on 9-10-2012.
- Dr. Raka Saxena, joined as Senior Scientist on 17-12-2012.
- Ms. Pavithra S. joined as Scientist on 11-1-2013.
- Dr. S. K. Srivastava joined as Scientist on 23-1-2013.

- Ms. Monisha Banerjee joined as Administrative Officer on 12-6-2012.
- Sh. Yatin Kohli joined as Assistant on 7-7-2012.
- Sh. Lalit Sharma joined as Assistant on 21-9-2012.
- Sh. Sandeep Mathur joined as Assistant on 24-12-2012.

Transfers

- Sh. A. K. Aggarwal, Administrative Officer transferred to NCIPM on 23-05-2012 and relieved from NCAP.
- Ms. K. Varalakshmi, Scientist transferred to Indian Agricultural Research Institute on 10-10-2012.

Retirement

- Sh. Vinod Kumar, Assistant Administrative Officer Superannuated on 30-11-2012.
- Dr. (Mrs.) Diana Sarungbam, Scientist took voluntary retirement from Council Services w.e.f. 1-12-2012.