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Editor
Dr. K.K. Vass

From President's Desk

Silver Jubilee of NAAS-Reflections



The Silver Jubilee Celebrations of the Academy concluded successfully on June 5, 2015. At the outset, I thank the esteemed Fellowship for actively participating in various events during 2-5 June, 2015. It is on the support and strength of our Fellowship that

we have grown from strength to strength. Our journey to the 25th Year has been full of trials as also triumphs. Beginning in 1990, from the precincts of IARI, the Academy has emerged as a vibrant national brain trust dedicated to science-led agricultural transformation to reshape India. We have been fortunate that during the celebrations, several of our Past Presidents, Vice-Presidents and office bearers graced the events. The Founder President, Prof M.S. Swaminathan, was gracious to Chair and participate in the deliberations on all the days. He guided us and inspired the entire Fellowship by his Special Silver Jubilee Lecture 'Sixty Years of Adventure in Agricultural Sciences'. In fact, his vision of the Academy in 1990, coupled with sterling contributions of the ensuing Presidents, has taken NAAS to an enviable pedestal, but much remains to be done was the underlining message from his lecture. His presence instilled confidence and exuberance among all agriculture scientists assembled during the celebrations.

Along with the wisdom of our seniors to show us the way forward, the thrust in celebrations was to listen to our young minds. In this connection, events like youth convention and presentations by NAAS Associates were timely and several new ideas emerged for the Academy. As a token of love and affection, the Academy also took this opportunity to felicitate the former Presidents and office bearers, conveners of Agricultural Science Congress events and the staff of the Secretariat for their untiring efforts and commitment over the years to bring the Academy to this stage. In its goal to enrich science and technology generation and adoption, the Academy was honoured by the participation of farmers and agri-entrepreneurs who have shown the way of harnessing technology for agricultural growth in their respective areas. This was also an occasion to remember our

esteemed fellows who have left an indelible mark through their significant contribution to the growth of the Academy, but are no more amongst us.

The Academy has been and would continue to endeavour towards science-led agriculture for greater efficiency and resilience. The wisdom, expertise, experience and skills of the Fellowship have enabled this institution to provide guidance and inputs in different phases to policies related to agriculture sector. This Silver Jubilee, apart from a moment of happiness and fulfilment to each one of us, is also an occasion to redeem our pledge to dedicate ourselves to the cause of Indian Agriculture and promoting excellence in Agricultural Sciences.

I congratulate all Fellowship who participated in the celebrations and profusely thank all EC members, secretariat staff, and members of different committees from various ICAR Institutes who directly or indirectly worked day and night to render the Silver Jubilee Celebrations a grand success.



S. Ayyappan
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Silver Jubilee Events

As per the approval of AGM in 2014, the Executive Council formulated a befitting plan to celebrate the 2014-2015 as the silver jubilee year by organizing various events during different periods and culminating with the celebrations from June 2, 2015 to the Academy Foundation Day on June 5, 2015. The highlights of various events are presented hereunder.

Youth Convention

Elocution competition

On June 2, 2015 the Silver Jubilee Celebrations began with Youth Convention in which Elocution Competition was the first item. It was inaugurated by Dr S. Ayyappan, President NAAS & DG, ICAR. In his



opening remarks he mentioned that we need to listen to young minds who will lead Indian Agriculture for the next 50 years. This session was convened by Dr R.K. Jain, Dean & Joint Director (Education), IARI along with Dr Sanjay Kumar Singh and Dr K.M. Manjaiah of IARI as Co-conveners. Post-graduate students from 23 institutions participated in the competition. Of the 23 presentations, 16 were made by women students. The young minds were generally of the view that by 2040, Indian Agriculture would be more challenging and knowledge-intensive. To retain youth in agriculture the opinion emerged that we need a major thrust to promote agri-enterprises with desired technological up-gradation and innovations. These students also expressed that in order to maintain self-sufficiency in food and assure nutrition security in the country, more investment/ budgetary support will be needed for agricultural research, education and extension.

On the basis of write-up submitted and presentations made by the young minds, a three member judging committee comprising Dr C. Devakumar, Former ADG, Dr Gaya Prasad, ADG (Animal Sciences) and Dr (Mrs)



Shelly Praveen, Principal Scientist, IARI, adjudged the participants. Ms. Anusha K.N. and Mr. Ashutosh Kumar of University of Agricultural Sciences, Dharwad, Karnataka were declared 1st followed by Ms. Anmol Grewal and Mr. Amritpal Singh Randhawa of Punjab Agricultural University, Ludhiana as 2nd and Ms Binjan K. Patel and Mr. Ankit Jayrambhai Raval of Anand Agricultural University, Anand, Gujarat as 3rd. The certificates of participation and medals to winners were presented by Prof Anupam Varma, (Vice-President, NAAS) and Dr M.P. Yadav and Dr K.V. Prabhu, Secretaries of the Academy. At the end, Dr Sanjay Kumar Singh proposed a formal vote of thanks on behalf of Academy.

Essay Competition

During April-May 2015 essay competition on "Farming as My Profession" was conducted among the





Post-graduate students of SAUs, CAUs, and ICAR Deemed Universities.

It was a two stage competition, the first at the university level and later at intra-institutional level. A total of 60 essays from 30 universities were evaluated by the judging committee. Based on their evaluation, Mr. C.M. Parsottam of Anand Agricultural University, Gujarat was first followed by Mr. S. Karthick of Tamil Nadu Fisheries University, Tamil Nadu as second and Ms. Sujayashree of the S.V. University of Horticultural Sciences, Bagalkot, Karnataka as third. The convener of this entire programme was Dr A.K. Srivastava, Director and Vice-Chancellor, NDRI, Karnal.

Silver Jubilee Panel Discussion on 25 Years of Achievements in Agricultural Sciences and Way Forward for 2030

This important session held on June 3, 2015 was chaired by Prof M.S. Swaminathan and Co-chaired by Prof R.B. Singh and Dr S. Ayyappan. Based on the outputs of 8 Silver jubilee symposia organised by various conveners during 2014, each one of them highlighted the achievements of last 25 years in their respective disciplines and also proposed a way forward for 2030. Respective conveners, namely, Dr Ajay Parida (Crop Sciences); Dr H.P. Singh (Horticulture Sciences); Dr Biswapati Mandal (Natural Resource Management); Dr C.S. Prasad

(Animal Sciences); Dr W.S. Lakra (Fisheries Sciences); Dr S.N. Puri (Plant Protection); Dr Anwar Alam (Agricultural Engineering & Technology); and Dr Mahtab S. Bamji (Social Sciences) made the presentations. The eminent panellists also provided their inputs to the discussion on each theme area. Dr K.L. Chadha mentioned that while the overall Horticulture production has made strides as a result of advanced technologies and their implementation, a lot more remains to be done in the field of processing and product development. Responding to the issues of Plant Protection, Dr A.N. Mukhopadhyay advocated the intensive use of bio-pesticides based on *Trichoderma* and stressed its mass production. In respect of Animal sciences, Dr P.N. Bhat strongly advocated that policy decision needs to be taken on millions of unproductive livestock (buffalo and cows) that are not useful to sustain. Our large bovine population is rather impeding the faster development of livestock sector. Dr A. Gopalakrishna strongly advocated support for mariculture, processing and product development in marine fisheries with adequate enabling policies. Dr S.M. Virmani emphasized to have a relook at agro-ecological zones, soil health management and redefine an economic unit of landholding. Dr Mruthyunjaya stressed upon the greater role of social scientists under NARES and mentioned that they should do original research in their field of specialization while supplementing efforts in other branches of agriculture. The chair and co-chair in their concluding remarks appreciated outputs from this important discussion session and complimented all the conveners and panellists including fellowship for important interventions during discussions.

Inter Academy Meet

The Inter-Academy meeting (discussion on Science-led Development in India) was held on June 3, 2015 under the chairmanship of Dr S. Ayyappan and Prof Anupam Varma as the convener. The Presidents/ Vice-Presidents of seven academies participated.





The National Academy of Sciences, Allahabad was represented by Dr A.K. Tyagi; Indian Academy of Sciences, Bangalore by Dr Rakesh Tuli; Indian National Science Academy, New Delhi by Dr R. Ramaswami; National Academy of Veterinary Sciences by Dr K.M.L. Pathak ; National Academy of Biological Sciences, Chennai by Dr D.J. Bagyraj; National Academy of Dairy Science by Dr A.K. Srivastava; and National Academy of Agricultural Sciences, New Delhi by Dr S. Ayyappan. Responding to the theme of meeting “Science-led development”, the respective representatives of these academies highlighted their perspectives. Dr A.K. Tyagi of National Academy of Sciences-Allahabad mentioned that future development should keep environment as the core followed by society and economy and also stressed on genomic selection an important area of research. Dr Rakesh Tuli of Indian Academy of Sciences –Bangalore highlighted the importance of genome editing. Dr R. Ramaswami of Indian National Science Academy - New Delhi stressed on improving basic sciences and advocated for curiosity-driven basic sciences in Universities. Dr K.M.L. Pathak of National Academy of Veterinary Sciences highlighted the use of modern tools in improving the livestock breeds for higher production, disease control and profitability. Dr D.J. Bagyraj of National Academy of Biological Sciences -Chennai highlighted the activities of this newly formed academy and mentioned that NAAS Fellows could be considered for the Fellowship of their academy. Dr A.K. Srivastava of National Academy of Dairy Science strongly advocated that newer technologies be used to develop functional foods and bioactive compounds from milk surpluses. Dr S. Ayyappan of National Academy of Agricultural Sciences projected the major achievements of the Academy since its inception. There was very fruitful interaction among the NAAS Fellowship and representatives of the various academies. Intervening in the discussion, Dr (Mrs) Manju Sharma (Former Secretary, Department of Biotechnology, GoI) suggested that these academies

to take joint programmes on science education, to involve more women in science; and to launch an inter-academy child nutrition programme with support from all ministries, and desired NAAS to take lead in these initiatives. Dr I.P. Abrol mentioned that integration of science through academies requires some institutional linkages and the most important issue is to improve the quality of research. Dr J.C. Katyal mentioned that all academies should focus on soil health issue as it will be critical for our future development in agriculture and related food production systems, and will impinge on our economy. All the academies evinced keen desire to collaborate on major science-led development issues for the country. At the end, Prof Anupam Varma appreciated and thanked the academies for their participation in this important meeting organized by NAAS on its Silver Jubilee.

Special Silver Jubilee Lectures

To mark the Silver Jubilee Celebrations of NAAS, three special lectures were delivered by three eminent personalities in the afternoon of June 3, 2015. The first lecture was delivered by the Father of Green Revolution in India, a living legend, one of the three Indians among the 20 influential persons in Asia, Founder President of NAAS, Former Member, Rajya Sabha, UNESCO Chair in Eco-technology and Chairman, MSSRF, Chennai, Prof M.S. Swaminathan. The second





lecture was delivered by Dr David Bergvinson, Director General, ICRISAT, Hyderabad and the third one by Dr K.H.M. Siddique, Hackett Professor & Director, the UWA Institute of Agriculture, Australia. This session was chaired by Prof Swaminathan and Co-chaired by Prof R.B. Singh and Dr S. Ayyappan. The Vice-presidents of the Academy Prof P.L. Gautam and Prof Anupam Varma formally introduced the speakers to the audience including the entire Fellowship.

At the start of his lecture on 'Sixty years of adventure in agriculture science', Prof Swaminathan stated that NAAS has rendered invaluable service in enhancing the prestige and purpose of agricultural sciences as well as public policy formulation and greeted entire Fellowship on the occasion. He shared with the Fellowship his initiation to research as Associateship of IARI during 1947-49, on non-tuber bearing *Solanum* under the mentorship of Dr B.P. Pal and Dr Harbhajan Singh. Later during 1949-50 he shifted to the Department of Genetics, Wageningen University and worked with Prof R. Prakken on tuber bearing *Solanum* for developing nematode resistance in potato. He pursued Ph.D. on the origin of potato at Fitzwilliam College, Cambridge University during 1950-52. This was followed by gene transfer across sexual barriers in potato at the Department of Genetics at the Wisconsin University, USA during 1952-54, developing an "artificial stigma" technique for gene transfer. Coming back to India, he worked at CRRI, Cuttack where Dr K. Ramiah put him on Indica and Japonica rice hybridization programme. Between 1954 and 1972, at IARI in different capacities, he led the Green Revolution by breeding high yielding varieties of wheat by exploiting transformational dwarfing genes, combined with leaf rust resistance, wide adaptability and responsiveness to intensive management. He underpinned the congruence of technology, public policy, especially input and price support, farmers enthusiasm and political will in achieving the unprecedented success. The Fellowship also learnt of his unmatched institution-building abilities both at national and international levels. As head of

the ICAR during 1972-80, he took major initiatives to establish ARS, ASRB, NAARM, ICRISAT, KV and Lab to Land programme. The stay between 1980-82 at the Planning Commission concentrated in developing Sixth Five Year Plan for Agriculture, and for the first time, vital issues such as environment, women & development and self-employment became independent chapters in the National Plan document. During 1982-88 he led IRRI – premier CGIAR institute to new heights, especially its pro-woman, pro-poor and pro-environment, approach. The Fellowship drew inspiration from Prof. Swaminathan's ever-intensifying commitment to serve the society through science by establishing the pioneering MSSRF, Chennai, with centres in Kerala, Orissa, Pondicherry etc. focusing on issues like coastal research, biodiversity & biotechnology, eco-technology, nutrition & health, information technology, gender-sensitive development, and climate change resilience. Prof. Swaminathan emphasized that we ought to strive for "Evergreen Revolution" based on "Ecotechnology" convergently rooted in the principles of ecology, economics and environment. This profound message must guide our research and development efforts to meet the Zero Hunger Challenge. He concluded that we need to work on developing community food and water security system, ensuring food safety and culmination in Bio-happiness. Entire Fellowship and the audience listened to him in rapt attention to grasp some thoughts of his wisdom and gave a standing ovation to the learned speaker.

The second special lecture was delivered by Dr David Bergvinson, D.G., ICRISAT, Hyderabad on "Demand-driven innovation in agriculture: Creating economic opportunity for smallholder farmers and nutritional security for consumers". In his lecture, Dr Bergvinson focused on using IT tools and mobile technologies in promoting crop value chains and digital design for agriculture development which will help in real time monitoring, reference to technologies involving effective soil and water use, soil mapping, and soil micro-nutrient status. Such applications can reach remote areas, reduce the costs and farmers can be in touch with consumers. Emphasizing expanded partnership and communication among all stakeholders, he lauded the recent initiative of the Government of India in the launch of dedicated TV channel for agriculture. His lecture was profusely appreciated by the entire house.

The third lecture was delivered by Dr K.H.M. Siddique, Hackett Professor & Director, Institute of Agriculture, Australia, on "Innovations in adaptation to climate change in dry-land agriculture". He gave brief accounts of his institute and the work done by him and his group

in the field of climate change adaptation strategies in Western Australia. Drawing priority attention to vulnerability and uncertainty, Dr. Siddique emphasized that these oscillations be quantified, monitored and managed. He suggested that the unseen should be seen and root systems should also be adequately researched in relation to soil and water conservation and management. He alerted that business as usual will not meet the projected productions, and advocated for close co-operation between Indian and Australian scientists for developing innovative strategies to offset the impacts of climate change. The Fellowship appreciated the work presented by Dr Siddique and showed keen interest in some of the innovations tested by him in Australia. The lecture was very well received by the entire house.

Summing up the three special lectures, Prof R.B. Singh observed that the over 60 years of adventure in agricultural research and development of Prof. M.S. Swaminathan is verily a saga of outstanding science, vision, leadership and commitment for transforming agriculture to free the humanity of hunger. The presentation will remain an eternal source of inspiration to all scientists and development partners.

Dr David Bergvinson's lecture conveyed a strong message that science-technology and innovation are *sine-qua-non* for agricultural transformation to reshape India and the world. Among other-thing, he advocated for a systems biology approach seeking integration of ecological, environmental, economic and social security.

Dr K.H.M. Siddique urged for an interdisciplinary management of the climate change-induced uncertainty and volatility and strongly advocated adaptation-led mitigation to ensure the triple wins of productivity, resilience and mitigation. He placed genetic amelioration of biotic and abiotic stresses and risks at the centre stage for creating climate smart agriculture.

NAAS Associates Panel Discussion

A Panel Discussion of NAAS Associates on "Views of Young Scientists on Research Challenges in the Changing Climate Scenario" was organized on June 4, 2015 under the chairmanship of Prof Anupam Varma, Vice-President and convenership of Dr C. Viswanathan and Dr Radha Prasanna. Fifteen NAAS Associates covering three areas viz., Natural Resource Management, Animal Sciences and Crop Improvement and Protection made presentations followed by interaction with the Fellowship. The house complimented the young scientists and provided alternate ideas to further improve their research. Under NRM, five presentations were made by Dr Anup Das,



Dr Parveen Kumar, Dr G. Mahajan, Dr G. Selvakumar and Dr V.K. Singh. At the end of this session, the Fellowship suggested that a policy paper may be prepared on weed management, and advocated a need for appropriate policies on forest cover, minimum rain harvesting area and canal water use. Under Animal Science, seven presentations were made by Dr S. Bandyopadhyay, Dr A.K. Bera, Dr R. Rajan, Dr I. Samanta, Dr Y.S. Malik, Dr B.M. Naveena and Dr A. Patra. During the discussion the Fellowship suggested that a policy paper may be prepared on problems and prospects of camel milk production, giving emphasis on the import/export policies of livestock. Further, it was also stressed that a 10 point biosecurity strategy on backyard poultry production should be popularised by ICAR for enhancing production and health of rural people. It was felt that migration of diseases through animal movement or pathogens through pastoralists and nomads pose a major challenge to be addressed in future. Under the Crop Improvement and Protection, four presentations were made by Dr Anirban Roy, Dr P.L. Kulwal, Dr S.Sahu, and Dr S.K. Yadav. During discussion, the Fellowship suggested research thrust on climate induced emergence of diseases and pests, C4 photosynthesis and biological nitrogen fixation by cereal crops. At the close it was proposed that based on the outputs of this panel discussion, NAAS should facilitate in developing effective multi-disciplinary programmes to address the climate change issues.

Presentations by Newly Elected Fellows

On June 4, 2015 in the afternoon in session-I held under the chairmanship of Prof P.L. Gautam and Prof M.P. Yadav, the newly elected Fellows under Crop Sciences, Horticulture Sciences, Animal Sciences and Fisheries Sciences gave presentation about their work before the entire fellowship of the academy. The presentations were made by Dr Arvind Kumar, Dr Shelly Praveen, Dr G.P. Singh, Dr B.C. Viraktamath, Dr D.K. Yadav under the Crop Science section; Dr T.K. Behera, Prof G.R. Rout,



Dr Major Singh under Horticulture Science section; Dr R.N. Chatterjee, Dr M.S. Chauhan, Prof A.K. Misra, Dr Y.S. Rajput under Animal Science section; and by Dr J.K. Jena, Dr C.N. Ravishankar under Fisheries Science section. There was active discussion on each presentation. In the session -II held under the chairmanship of Prof Anupam Varma and Dr K.V. Prabhu, the newly elected Fellows under Natural Resource Management, Plant Protection, Agricultural Engineering & Technology, and Social Sciences made presentations about their work before the esteemed fellowship. Dr S.S. Kukal, Dr M.C. Manna, Dr A.K. Nayak, Dr P.W. Ramteke, Dr H.S. Thind under NRM section; Dr J.S. Bentur, Dr Jitendra Kumar, Dr Rakesh Pandey under Plant Protection section; Dr T.K. Goswami, Dr A.K. Sharma under Agricultural Engineering section while Dr K. Madhavan Nair made presentation under Social Science section. The Fellowship had detailed interaction on all presentations. All these Fellows were admitted to the Academy at a ceremony held on June 5, 2015 and presented with Fellowship.

Main Decisions of 92nd EC Meeting

The meeting was held on June 2, 2015 in the Academy Secretariat. It was attended by 20 EC members and special invitee. The meeting started with observance of 2-minute silence in the memory of Dr (Ms) Prem Dureja, esteemed Fellow and Editor of the Academy. In this meeting the Executive Council approved the minutes of 91st meeting. The action taken report was deliberated and progress was noted with satisfaction. It was decided that XIII Agricultural Science Congress on "Climate Smart Agriculture" will be organized at UAS, Bengaluru in 2017. It was also agreed to treat the Shri L.C. Sikka Endowment Award and Dr A.B. Joshi Memorial Award at par with other Memorial Awards. The EC also approved the Annual Report 2014-15 of the Academy and the audited statement of accounts for the year 2014-15.

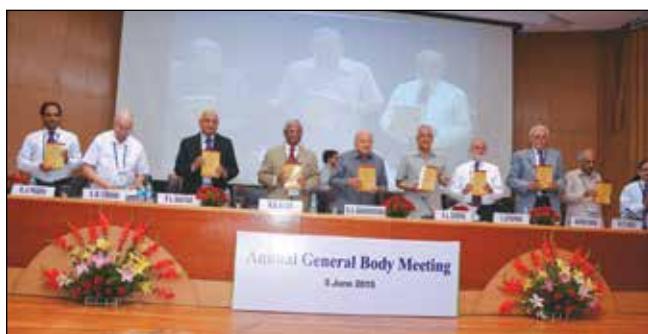
Brief Report on AGM

The 22nd AGM was convened under the chairmanship of the President of the Academy on June 5, 2015 and was attended by 232 Fellows. The Silver Jubilee AGM was graced by past Presidents including Prof M.S. Swaminathan, Prof V.L. Chopra, Prof R.B. Singh, past Vice-President Dr Panjab Singh and a number of former senior peers and office bearers of the Academy. Prior to start of deliberations, a 2-minute silence was



observed by the entire house as a mark of respect in the memory of Dr S.A.H. Abidi, Dr S.P. Singh, Dr S.S. Prihar, Dr (Ms) Prem Dureja and Dr Lloyd Thomas Evans, the Fellowship who passed away since last AGM. The meeting started with the presentation of a detailed Secretary report by Prof M.P. Yadav. It was adopted by the house after brief interaction by the esteemed fellowship. This was followed by the presentation of reports by the Editor Dr K.K. Vass and Foreign Secretary Dr S.M. Virmani, which were adopted by the house. The Annual Report 2014-15, presented by Dr K.V. Prabhu, Secretary of

the Academy, was also adopted by the house. The Treasurer, Dr Himanshu Pathak presented the detailed Balance Sheet and Audited Accounts of the Academy for the year 2014-15 and after brief interaction by the Fellowship it was accepted and adopted by the house. The AGM in 22nd meeting also lent its approval to some of the important decisions taken by EC since last AGM. These include appointment of new auditors, guidelines for institutional membership, election of foreign and pravasi fellows, defining the coverage of each regional chapter, revised guidelines for Academy awards, and admission of new fellows and associates. The house was also informed that efforts taken by NAAS on the issue of public debate on GM crops

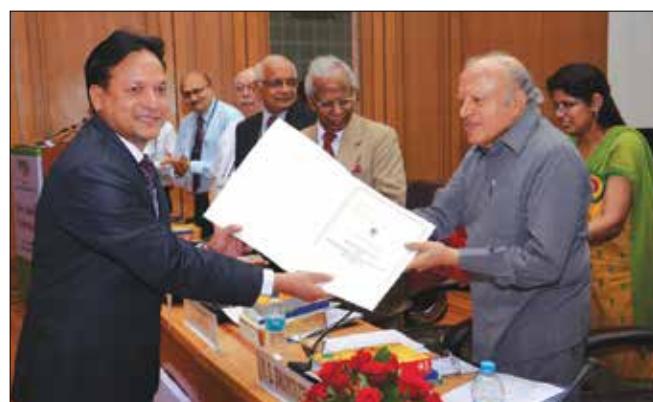


has received response and overwhelming appreciation from the Ministry of Environment, Forests and Climate Change, Government of India. The fellowship was up-dated on the issue of UGC recognizing NAAS as one of science academies in the country. On this occasion, four special publications of the Academy namely, 100 Years Agricultural Sciences in India, Down the Memory Lane (25 Years of NAAS), State of Indian Agriculture - Energy, State of Indian Agriculture – Water were released.

General discussion

Many esteemed fellows participated in the general discussion and proposed valuable suggestions. Dr (Ms.) M.S. Bamji mentioned that Home Science with regard to nutrition security should receive attention. Dr T.K. Adhya suggested an inter-Academy summer training camp. Dr T. Mohapatra desired that future relevance of research and role of private sector in agriculture needs a discussion. Dr S.S. Acharya emphasized on more effective policy advocacy to be proactive in bringing out hidden trade issues and oil seed issue. Dr Mruthyunjaya raised the issue of future role of SAUs and ICAR in sharing of human resources and research agenda for agriculture together or separately. Dr K. Gopakumar expressed for the priority need of quality control of fruits and vegetables in the country. Dr C.L. Acharya mentioned that implementation of Policy Paper recommendation is not the role of the Academy but we need to make efforts to strengthen the education in SAUs. The newly elected Foreign Fellow

Dr Siddique observed that talent is declining and we need to benchmark the universities. Dr K. Pradhan observed that Academy Policy Papers if implemented can bring improvement and cited a success case in Orissa. Dr Devakumar raised the issue of inadequacy of existing trained manpower support to address the complex issue of agriculture production, ensuring quality and security of food including nutritional demand. In this context he suggested that a Committee under NAAS may develop a blue print for producing required human resource for further follow up action. Dr Gurbachan Singh raised the issue of improving education in our system and suggested a discussion on 7th Pay Commission and asked whether we should continue to follow UGC pattern or follow some alternative that would be more effective for ICAR system. He also mentioned that Academy should try to integrate farms, farmers, programmes and formulate crop productivity index. Dr S.L. Mehta mentioned that through the efforts of NAAS the quality of Journals has improved but we need to improve the quality of agricultural education. In this connection he suggested that the Academy can mentor good SAUs and help others to grow. The Fellows can adopt and demonstrate this improvement on a voluntary basis. The President, Dr S. Ayyappan, expressed thanks to all esteemed fellowship for expressing their opinions while he and Prof R.B. Singh responded to some of the points raised in the discussion and assured that Academy will look into the issues in more details for any follow-up action that may be required.



Fellows and Associates for 2015 who were admitted to Academy in person

Fellows:

Crop Sciences

1. Dr Arvind Kumar
2. Dr Shelly Praveen
3. Dr G.P. Singh
4. Dr B.C. Viraktamath
5. Dr D.K. Yadava

Horticulture Sciences

6. Dr T.K. Behera
7. Prof G.R. Rout
8. Dr Major Singh

Animal Sciences

9. Dr R.N. Chatterjee
10. Dr M.S. Chauhan
11. Prof A.K. Misra
12. Dr Y.S. Rajput

Fisheries Sciences

13. Dr J.K. Jena
14. Dr C.N. Ravishankar

Natural Resources Management

15. Dr S.S. Kukal
16. Dr M.C. Manna

17. Dr A.K. Nayak

18. Dr P.W. Ramteke

19. Dr H.S. Thind

Plant Protection

20. Dr J.S. Bentur
21. Dr Jitendra Kumar
22. Dr Rakesh Pandey

Agricultural Engineering and Technology

23. Dr T.K. Goswami
24. Dr A.K. Sharma

Social Sciences

25. Dr K. Madhavan Nair

Foreign Fellow

26. Dr K.H.M. Siddique

Associates:

1. Dr Anup Das
2. Dr A. Kumaresan
3. Dr M. Senthil-Kumar

Dr. C.L.L. Gowda (Crop Sciences), Dr. J.K. Dandona (Plant Protection) and Dr. K. Palanisami (Social Sciences) were admitted as Fellow, in *absentia*. Dr. R.S. Zeigler was admitted as Foreign Fellow, in *absentia*. Dr. N.K. Lenka was admitted to the Associateship, in *absentia*.

Presidential Address

Dr S. Ayyappan, delivered the Presidential address on "Response for Resilience: Happy Agriculture". At the outset he congratulated all the fellowship for Silver Jubilee celebrations and expressed that Academy is indebted to the decision of Late Dr B.P. Pal and Prof M.S. Swaminathan for its origin. He mentioned that from a humble beginning from the precincts of the IARI, the academy has emerged as a vibrant national level body, and at present has earned the distinction of an Academic Platform, dedicated to the cause of agriculture and agricultural sciences in the

country. In his address he highlighted *Preparedness and response strategy to manage extreme events*. He stated that in the year 2014 and ongoing 2015 many aberrant climatic events have been encountered of which frequency and intensity were unprecedented. These included late-and-deficient monsoon, floods in J&K, cyclone Hudhud on the east coast and lashing of hailstorm just before the harvesting of rabi crops this year. He advocated that advanced planning and preparedness can reduce the extent of damage, and would be a help in faster restoration of life and property to these extreme events. He stressed a multi-disciplinary approach for risk management to reduce vulnerability and improve access to services, information, education and empowerment of life and property for combating the situation. In the National Policy on Disaster Management it is stated that the country is vulnerable, in varying degrees, to several forms of disasters, both natural and manmade. He flagged five distinct vulnerable regions: the Himalayan region to earthquakes and landslides, the alluvial plains region to annual incessant floods, the desert region



to droughts, and the coastal region to cyclones and storms. Therefore, need of the hour is formulation of disaster reduction policies.

Dr Ayyappan brought out that sharp fluctuations in agriculture output in India are mainly attributed to South-west monsoon. The data indicated that about 16% of the country's total area and 68% of the sown area is drought prone and annually about 50 million people in the country undergo crisis owing to drought. In the past decade, the country experienced two all India droughts (2002 and 2009), and drought in several states in 2012. He informed that between 2002 to 2015 there occurred 10 extreme weather events in the country that impacted agriculture in many ways across the country. This requires enhancing the resilience of Indian Agriculture to cope with such events to secure livelihood of millions of small and marginal farmers in the country. Thus devising appropriate adaptation strategies would enable farmers to cope better with aberrant climate along with efficient use of natural resources. In this direction he stressed upon Climate-smart-agriculture and initiation of NICRA during 2010-2011. He highlighted that through this project in 100 vulnerable districts, on farm available technologies have been demonstrated and implemented. He mentioned that the ICAR has taken some more initiatives including coping strategies for climatic risk as below:

District level contingency plan for weather aberrations: A standard template was designed and contingency plans were formulated for drought and other extreme events by the ICAR-CRIDA in collaboration with multi-disciplinary scientific team at 45 SAUs. Till date 580 district level contingency plans are available for implementation by the State Governments.

Climate smart practices and technologies: Pilot implementation of appropriate technologies in farmers' fields on real time basis is underway in 28 districts in 130 climatically vulnerable districts. The main aim of the technology demonstration is not on enhancing productivity but is on the intervention, which can cope with vulnerability and improve natural resource use efficiency. The favourable impacts of such interventions were evident in many states subject to these extreme events.

Small farm mechanization through custom-hiring: Average operational land holding size is estimated at 1.16 ha and about 80% of land holdings are with small and marginal farmers. Some kind of mechanization makes agriculture more efficient and remunerative. In this context, Custom hiring centres (CHCs) have been established in 100 NICRA villages.

Space technology: During *Hudhud* fore-warning about cyclone enabled the state machinery to respond and take requisite measures. Therefore, integration of science and technology in disaster risk reduction and management holds the key towards creating not only resilient agriculture but a resilient society as well.

Conservation agriculture: Over the last few years, adoption of zero-tillage has expanded to about 2 m ha in the country. The (CA) conservation agriculture provides a truly sustainable production system. Greater emphasis on water harvesting and improving farm water use efficiency could help face uncertain rainfall.

Developing and testing weather index based insurance products; Weather –based crop insurance scheme (WBCIS) is being implemented as a component of the National Crop Insurance Programme (NCIP) which covers main crops. The WBCIS has been implemented in 19 states, covering 19 million farmers with a total pay-out of Rs. 4,078 crore.

The speaker highlighted specific cases in which timely technology interventions have enhanced resilience in Indian agriculture while facing abiotic stresses. He urged that farmers need to adapt to changing climate to sustain farm production and their income. So adoption of climate resilient practices and technologies by farmers is more of a necessity than an option. Impressing that adaptation to climate change impacts may be considered in all major policy considerations, development planning activities and capacity building programmes to strengthen coping mechanisms to climate risks.

Concluding his address, Dr Ayyappan mentioned that the Academy has been and would continue to endeavour towards science led agriculture for greater efficiency as well as resilience. He reminded the Fellowship that Silver jubilee is an occasion to redeem our pledge to dedicate ourselves to the cause of Indian agriculture.

Silver Jubilee Felicitation

On this occasion three progressive farmers namely Shri Sudhir Chadha, Shri N.C. Sipani, and Shri Sudhir Agarwal were honoured by the Academy President for their contribution to the agriculture farming. The fourth to receive this honour was Shri Anil K. Mittal, Chairman & Managing Director, KRBL Ltd an Agri entrepreneur. The Academy also honoured all its past Presidents, office bearers, various conveners of different events, officers of NAAS Secretariat,



for rendering valuable service to the growth of the Academy.

Reflections of Peers

Among the peers who spoke on this occasion were Prof M.S. Swaminathan, Prof V.L. Chopra, Prof R.B. Singh, Dr Panjab Singh, Dr S.M. Virmani,

Dr S.L. Mehta, Dr S.S. Acharya, Dr K. Pradhan and Dr I.P. Abrol. They expressed their happiness on the growth and stature that Academy has reached by dedicated support of its fellowship and sustained support of ICAR. They complimented the EC for smooth conduct and organization of Silver Jubilee Celebrations and wished the Academy well in future.

Foundation Day Lecture

Prof Y.K. Alagh, Chancellor, Central University Gujarat, Professor Emeritus and Vice Chairman, Sardar Patel Institute of Economic and Social Research, Ahmadabad and Former Union Minister of Power and for Planning & Programme Implementation, delivered the foundation day lecture on "Structure of Indian Agriculture-Growth and Policy Epochs" on June 5, 2015. In his lecture, he tried to examine the structure of economic growth in agriculture sector vis-a-vis the role of policies in each epoch. He posed a question if the agriculture policies are need driven or driven by agencies, natural factors or by perceived needs of the larger economy at home and abroad? In the growth epoch, he discussed about green revolution, and mentioned that this term in India leads to two images. In the popular mind it is associated with a period in which India crossed the hump in terms of shortages of, and external dependence for its grain and food requirements. The second more technical



perception of the green revolution considers it as the productivity breakthrough emerging from the high yielding variety of seeds in food grains, particularly wheat and then rice. Thus technology and productivity improvement became the driving force in the green revolution areas.

Prof Alagh said that green revolution in India is seen as spanning four time epochs, the first being introduction of the high yielding technology, with the support of political leadership of that time. In the second phase comprising half of the mid-sixties, a "ship to mouth" phase of grain shortage and large grain import under PL 480 from USA. Around the same time the leadership took the risk of importing the dwarf varieties of wheat from IWRI in Mexico and ably assisted by Indian scientists, Prof M.S. Swaminathan and ICAR teams in replicating the seeds. During this period the technology was internalized in the decade of seventies. But there still was pessimism on the growth potential of Indian agriculture. The initial spurt of grain growth recorded stagnation around 101-104 million tonnes in the seventies and experts predicted that India will not reach the target of 125 million tonnes by 1978/1979. It was at that time that policy support to agriculture with priorities set at the level of the then Prime Minister Smt Indira Gandhi who saw food security as a central issue. The resource allocation for agriculture, particularly irrigation got high priority in the investment budget. With the result by 1978-79 India was producing 127 million tonnes and was a net exporter in grains. Later in the eighties, Indian agriculture grew faster and as economy picked up non-food grains were leading. The growth rate witnessed acceleration in new crops, particularly in rice, cotton and oilseeds. The output was now rising

3.37% compound annual as compared to 2.46 earlier. He drew a comparison of production and area under cultivation among all crops and non-food crops during the three time periods from fifties to late nineties to make a point that trend towards diversification, away from grains, is now more pronounced.

In his lecture, he also discussed important issue of terms of trade and investment in recent epochs. He argued that it is not just land productivity, but profitability of resource use that gives signals at the margin for resource use and investments. As the terms of trade moved in favour of agriculture investment rates went up. He mentioned that technology is going to be kingpin of solutions; studies have shown that at least one third of the future growth in productivity should come through innovations in crop technologies. Prof Alagh dealt in detail on the issues of land and water, integrated water resource management, and land and water resource information system.

In conclusion he mentioned that challenges facing us are severe. But the priority the Government is giving to the agriculture sector and infrastructure support for it is encouraging and of great strength to institutions like NAAS. The strategic nature of agricultural research, to support the policies and development plans, should not be lost sight of. I am sure NAAS must be the advocate for this in its Silver Jubilee.

Programmes Held

Regional Chapter Kochi

The first meeting of Kochi chapter was held at CMFRI on May 05, 2015 under the chairmanship of its convener Dr A. Gopalakrishna, Director, CMFRI. This chapter covering the region of Kerala and Lakshadweep has 11 Fellowship and 1 Associate. In the meeting

it was proposed to hold a brainstorming session on Maritime / Marine policy and laws to educate the stake holders regarding vessel policy. Further, the issues of chemical contaminants of food and role of chitin in agriculture were also debated. It was decided that the chapter would initiate activities focussing above region specific issues.

Brainstorming Session

A Brainstorming Meeting on *Role of Social Scientists in NARES* was held under the Convenership of Dr Mruthyunjaya in NAAS Secretariat on May 23, 2015. The meeting was chaired by Prof R.B. Singh, Immediate Past-President of the Academy. It was attended by 20 senior social scientists and agro-biological scientists. The purpose of the meeting was to discuss the present role of social scientists, constraints and way forward to strengthen their role to meet the increasing demand for social science inputs in agriculture research and education in

NARES. Five key presentations were made by eminent experts in the disciplines of agricultural economics by Dr Mruthyunjaya, agricultural extension by Dr Raseed Sulaiman, agricultural statistics by Dr Prajeshu, food and nutrition by Dr Mahtab Bamji, and in home science by Dr Sharada Devi. After detailed discussion, eight major recommendations emerged. Some key points were: the ICAR should consider to restore the position of ADG (ESM); home science education be opened for boys; all the sub-disciplines of social sciences be strengthened under NARES.

Fellows Views

Soil - Planet's Life Support System

The UN general assembly declared 2015 as the international year of soils. The FAO and several soil science societies, other organizations and associations have initiated/planned activities to commemorate the occasion. Soil supports the plant life which in turn supports the human and animal populations. Soil has been the foundation for the rise and fall of several civilizations in the past. Soil is a great biochemical laboratory with activities, processes and reactions facilitated by millions of microbes. Soil biodiversity provides several products and services to human, animal and plant life. Soils are playing great role in food security, climate change mitigation and adaption, essential ecosystem services, poverty alleviation, and sustainable development of nations. However productive soils are shrinking and forests, marginal lands and partly degraded lands are brought under

plough. Formation of soil takes thousands/millions of years but under bad management, heavy rains and high gales soil loss can occur in a few hours. Unless good agronomic/soil management practices are followed, soils get further degraded. Soils with associated flora and fauna *i.e.*, the landscape as a whole need to be secured, conserved and preserved for the posterity for the survival of mankind. Protecting the soils/landscapes with the associated water and vegetation with good government policies, laws and regulations is the need of the hour. All concerned need to highlight the issues related to good management and use of soils during the year 2015 and initiate measure to safeguard soil resources for food production sustenance, biodiversity conservation climate change resilience and environmental protection in future.

A. Subba Rao
Ex. Director IISS, Bhopal

Science and Technology Spectrum

A group of scientists led by Dr Prasanth Goswami at the Climate and Environment Modelling Programme of the CSIR- Centre for Mathematical Modelling and Computer Simulation, Bengaluru have in a paper "Virtual water trade and time scales for loss of water sustainability" published in the March 20, 2015 edition of Nature Scientific Report. The paper predicted that if the current rate of net export of water in end products continues, India will lose its "entire available water in less than 1,000 years". India, the US and China are

known to be the world's leading virtual water users and in the wake of growing consumption, such water trade plays a key role in the water sustainability of a nation. Therefore, a sustainable food or agriculture policy must be based on zero trade deficit or positive trade balance in virtual water. As water demand in other sectors like manufacturing, services and construction increases, this will put additional pressure on water sustainability in India.

(Source: E.V.S.Prakasa Rao, NAAS-Fellow)

Awards and Honours

Dr Modadugu Vijaya Gupta

It is matter of great pride for the Academy that one of its Fellows, Dr Modadugu Vijaya Gupta was declared joint winner of \$1M Sunhak Peace Prize with Kiribati President Anote Tong. The first winners of the Sunhak Peace Prize were announced on June 8, 2015 at the National Press Club in Washington, D.C. These two were chosen from 182 candidates from 66 countries competing for the prize. Thus it is a matter for happiness and pride for India as well. Dr Gupta has been honoured for creating an aquaculture system tailored to poor, rural population in Asia, Africa, and the Pacific. His methods have allowed communities to feed themselves and empower women by teaching

them how to raise and harvest the fish. Dr Gupta is also a recipient of World Food Prize in the year 2005. The entire Fellowship, and Fisheries fraternity in particular, feel proud of Dr Gupta for this international recognition.

Dr H.S. Gupta

Dr H.S. Gupta, Director General, Borlaug Institute for South Asia was honoured with the prestigious Rao Bahadur B. Viswanath Award (Biennium 2012-13) of the Indian Agricultural Research Institute (IARI), New Delhi for his outstanding research contribution in the field of plant breeding and genetics, particularly improvement of maize through marker assisted selection, in hilly areas.

Degree of Doctor of Science Conferred

The Board of Management of Sardar Vallabhbhai Patel University of Agriculture & Technology, Meerut, Uttar Pradesh (India) conferred on Dr Hari Shanker Gupta, Director General, Borlaug Institute for South Asia the degree of Doctor of Science (*Honoris Causa*) at the convocation of the University

held on February 16, 2015 by Shri Ram Naik the Governor of Uttar Pradesh. The University recognised the contribution of Dr Gupta as an outstanding researcher, research manager and teacher. Dr Gupta is fellow of NAAS and it is a matter of pride for the Academy that its distinguished fellow has received honours.

Change of Addresses

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Forthcoming Programmes

- *Climate Resilient Livestock Production* to be held on July 20, 2015 (Convener: Dr. Khub Singh and Co-conveners: Dr. Kusumakar Sharma & Dr. C.S. Prasad)
- *Issues and Challenges in Shifting Cultivation and its Relevance in the Present Context* to be held on August 17, 2015 (Conveners: Dr. K.M. Bujarbarua and Dr. U.C. Sharma)
- *Integration of Medicinal and Aromatic Crop Cultivation and Value Chain Management for Small Farmers* to be held on August 18, 2015 (Conveners: Prof. Anil K. Tripathi and Dr. E.V.S. Prakasa Rao)
- *Practical and Affordable Approaches in Implement Precision* to be held on August 29, 2015 (Convener: Dr. K.K. Singh, Co-conveners: Dr. S.R. Verma and Head, Dept of Farm Machinery & Power Engg, PAU)
- *Organic Farming* to be held on September 4, 2015 (Convener: Dr. B.S. Dwivedi and Co-Conveners: Dr. P.K. Chhonkar & Dr. R.K. Pathak)
- *Augmenting Forage Resources in Rural India: Policy Issues and Strategies* to be held on September 8, 2015 (Convener: Dr. P.K. Ghosh)
- Symposium on GM Technology (Convener: Dr. K.V. Prabhu)

Obituary



Dr. Prem Dureja
(1947-2015)

Dr Prem Dureja was Born in Delhi on 11th March 1947 she had her education leading to Ph.D in various places such as Bansthali Vidyapith Jaipur, St Francis College Secunderabad and Meerut University wherein she completed her post-graduation in 1970 and Ph.D. in 1974. She was the National Merit Scholarship holder in graduate programme and a Gold Medalist in M.Sc. She entered into the ICAR as the first batch ARS scientist in 1976 and superannuated as the Head of the Division of the Agricultural Chemicals at the premier Indian Agricultural Research Institute, New Delhi.

Under the Study Abroad Scholarship from the Union Ministry of Education, Government of India, she did her post-doctoral work in 1981-83 in the Department of Toxicology and Parasitology at the University of California, Berkeley, USA, under the guidance of Prof. John Edward Casida, the well-known insecticide toxicologist.

Her contributions as a teacher, a researcher and a research guide spanning over 36 years in the field of agrochemical research and education were enormously significant. She was uniquely an expert in instrumentation, which earned her name and fame throughout the country. She demonstrated a wide spectrum of expertise in pesticide research both in synthetic chemicals and bio-pesticides. She was adept in isolation and profiling of both active ingredients and their congeners. Her teaching of the advance course on metabolism and chemical transformations of pesticides was exemplary. She guided 18 students (3 M.Sc. and 15 Ph.D.) as the chairperson and over 100 students as a member of the student advisory committees. She was a mentor par excellence in working with the students. Even at the time of her demise, she was a consultant at The Energy Resource Institute, New Delhi. She had to her credit over 250 publications

(including 14 critical reviews), 29 book chapters, 13 patents and 7 books.

She occupied several positions viz. Vice President, 1995-97; Editor, 1999-2002; General Secretary, 2002-2005 and the President in the Society of Pesticide Science.

She had many firsts in her professional life: she was the first woman scientist, to Head the Division of the Agricultural Chemicals of IARI, New Delhi (from 2006 till her superannuation); the President of the Society of Pesticide Science India and the Editor of the National Academy of Agricultural Sciences India (NAAS), the last two positions she held at the time of her death. She was again the first woman scientist to win the Best Teacher Award (1995) of the Indian Agricultural Research Institute (IARI), the ICAR Awards for the Outstanding Woman Agricultural Scientist Award (1996), the Dr. C. Subramaniam Award for Outstanding Teachers (2006-07) and the prestigious Rafi Ahmed Kidwai Award (2003-04) in addition to two NAAS Awards(viz. Recognition award in Plant Protection - 2000 and Dr. K.C. Mehta Award - 2007-08).

Dr Prem Dureja breathed last on 17 May 2015 after a brief illness. Her death was received with shock and despair among her vast array of friends in the ICAR and the NAAS Fellowship. Her loss has left a void in the professional world. She is survived by her siblings and their families.

The office bearers at NAAS secretariat mourned at her sad demise in special meeting held at the Secretariat on April 18, 2015. Subsequently at the 92nd EC meeting held on June 2, 2015 her contribution as Editor of NAAS and a dedicated researcher was remembered by entire EC and her absence at the secretariat will be felt for long time. Dr Dureja had great team spirit qualities that are hard to find. The Fellowship mourns the sad demise of one of the distinguished fellows and pays its homage to the departed soul.

(C Devakumar, Ex-Editor) and (K.K. Vass, Editor)

Editor: Dr. K.K. Vass

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