

**8<sup>th</sup> Swadesh Prem Jagriti Sangosthi – 2016**

**Global Conference on  
Perspective of Future Challenges and  
Options in Agriculture**

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Maharashtra

**Presidential Address by**



**Dr. R. S. Paroda**

(Former Secretary DARE and DG, ICAR)  
Chairman, TAAS

*Organized by*

**ASM Foundation, New Delhi &  
Jain Irrigation System Ltd. Jalgaon, India.**

*In collaboration with*

**Trust for Advancement in Agricultural Sciences (TAAS) &  
Confederation of Horticulture Associations of India (CHAI)**

# Perspective of Future Challenges and Options in Agriculture – A Way Forward

**Dr. R. S. Paroda**

(Former Secretary DARE and DG, ICAR)  
Chairman, TAAS

Ladies & Gentlemen,

It is a great pleasure to be here amidst such a distinguished gathering to deliver the presidential address. I congratulate the organizers of the 8th Swadesh Prem Jagriti Sangosthi – 2016 and The Global Conference on **Perspective of future Challenges and Options in Agriculture**, namely ASM Foundation, and Jain Irrigation System Ltd. in collaboration with Trust for Advancement in Agricultural Sciences (TAAS) and the Confederation of Horticulture Associations of India (CHAI). This place, Jain Hills, Jalgaon, is well known for its most modern, green and innovative agriculture. The purpose of this conference is to sensitize on emerging issues in agriculture and to develop a road map for addressing new challenges. It is expected that deliberations in this conference will help in understanding the current concerns of agriculture, especially to achieve household food and nutritional security and to increase farm profitability.

Since Green Revolution over the last 5 decades, we have seen a paradigm shift from food scarcity to self sufficiency, mono cropping to crop diversification, flood irrigation to drip irrigation, conventional varieties to hybrid seeds, saplings to tissue culture plants and traditional to precision and speciality agriculture. However, the pressure on land and water continues to increase and it is becoming a challenge to feed our growing population which is touching 1.3 billion. Also we are seeing an unprecedented increase in consumer demand for more nutritious food like fruits, vegetables, meat, fish etc. Above 6 per cent growth in fishery and horticultural sectors over the last decade is quite remarkable. Both research and development and innovations by farmers had enabled India harvest record production of 264.7 million tonnes in 2014, which now got declined to around 258 million tonnes due to two consecutive droughts. By 2030, we would need to produce 70 per cent more food grains than what we are producing today, that too from declining natural resources. Thus, producing **more**

**from less** is an enormous challenge while facing second generation problems of green revolution and climate change. These are: 'factor productivity decline, poor soil health, loss of soil organic carbon, ground and surface water pollution, water related stress, increased incidence of pests and diseases, increased cost of inputs, decline in farm profits and an adverse impact of climate change'.

We are happy that the Indian agriculture continues to remain in forefront of development for providing livelihood to half of India's population. It also provides national food and nutritional security. Despite liberalization and the growth in services and manufacturing sectors, the role of agriculture is still around 14 per cent in our national GDP. Besides, more than 50 per cent of our rural population depend on agriculture and allied sectors.

Today, increasing productivity and farmers' income are two big challenges as size of the land holdings get decreased. Other critical areas are lack of knowledge and infrastructure in rural areas. Problems related to infrastructure for irrigation, power, markets and roads affect adversely the farm operations. Unlike other business enterprises, agriculture is prone to more risks on account of factors that are beyond farmer's control. On the contrary, the number of initiatives for agricultural development do not result in effective delivery mechanisms at the ground level, in terms of increasing productivity, decreasing cost or increased income by the farmers. We also need reforms in agriculture to encourage participation of private sector through creation of enabling environment being so crucial.

How we meet emerging challenges is a question before all of us. Will the technology-led agriculture succeed in producing more from the less? In my view, past experience of producing more through various revolutions is a testimony to take up new challenges also successfully. The emergence of new science like biotechnology, information technology, nanotechnology, bio-informatics etc. provides new hope. We certainly need climate smart agriculture as well as precision agriculture. Innovations like conservation agriculture, micro-irrigation, protected cultivation, tissue culture, GM crops, hybrid technology, aeroponics, precision nutrient management, IPM etc. offer great opportunities for out scaling and impact, provided supported well by the right policies and development related activities.

Agribusiness is currently a single largest sector in India, worth around Rs. 20,000 billion. Hence, India needs to focus more on agribusiness, a generic term for the various businesses involved in agriculture and food production, including farming/contract farming, seed supply, agro chemicals, farm machinery/equipment, wholesale distribution, food processing, marketing, etc. In future, agribusiness is expected to contribute approximately 27% in India's GDP, involving both production and processing components. The agribusiness segment is expected to nearly double in years to come, driven largely by growth in per capita consumption and changes in consumer preference towards value added and processed foods. Hence, greater thrust on post-production related activities through processing, value addition and effective marketing, including export, would go a long way in accelerating agricultural growth as well as farmers' income. We must, therefore, promote low cost rural based agri-processing and value chain related technologies/approaches.

Considering above, I would like to place before you a few thoughts for in depth deliberation during the conference, so that we have a clear Road Map to implement.

1. It is only agriculture that can liberate India from twin scourge of hunger and poverty while ensuring sustainability of our natural resources. It will also address effectively the concern of malnutrition among children and empowerment of women; being important sustainable development goals (SDGs). Thus, agriculture be seen not a cause but rather solution to the problem and considered an important segment of national economy.
2. The needs and aspirations of resource-poor smallholder farmers must be addressed in the first place through innovation-led accelerated and sustainable agricultural growth. Historically, the adoption of high yielding dwarf varieties of wheat and rice under the 'Green Revolution' era addressed both hunger and poverty. However, of late, the yield gaps in agriculture and the income divide in farm and non-farm sectors have been widening, primarily due to lack of proper knowledge, skills and timely access to improved technologies, including inputs. How can we ensure these should be our prime concerns to move forward.

3. Farmers' welfare needs to be ensured through, for example, 'Farmer First' approach to equally benefit both the producers and the consumers. Further, in view of diverse demand of new innovations, new products, new information and new extension services, we now need to shift from "Top-down" to "Bottom-up" extension approach, involving farmers' participation right from the grass-root level, while ensuring confidence building among farming communities to take risk and adopt more scientific and resilient agriculture. Thus, smart agriculture related innovations need to be scaled out.
4. Agricultural extension in India and elsewhere requires constant transformation. The current transitional phase also needs a 'renewed interest' and 'policy attention'. Public extension system, therefore, needs rewamping towards 'translational research' requiring outscaling of innovations through 'Out of Box' extension systems. Also, conscious deployment of rural youth, women and progressive farmers could help in much speedy transfer of technology for the needed impact on livelihood of smallholder farmers. For this, farmers' participatory approach for testing, refinement and adoption of farmer led innovations be ensured. Also, empowering youth (both men and women) through vocational training and building a cadre of 'Technology Agents' to provide technical backstopping as well as custom hire services to the smallholder farmers would go a long way in linking research with extension and thereby accelerating agricultural growth. We also need to link 'land with lab', the 'village with institute' and the 'scientists with society' to ensure faster adoption of efficient resource utilization technologies that would benefit both the producers and consumers. In the transformation process, the Agriculture Technology Agents need to become "job creators" and not "job seekers" and provide the best technologies as well as quality inputs on farmers' door steps. Another strategy could be to create 'Agri-clinics', where technology agents are able to join hands to ensure single window system of advisory services, so that farmers need not run from pillar to post and get best possible technical backstopping.

5. The growing challenges of natural resource degradation, resulting in factor productivity decline, poor soil health mainly due to nutrient imbalance and low organic matter content, escalating input costs, market volatility and above all the effects of global climate change have contributed to the decline in yield as well as farm income. Thus, we need to make agriculture diversified, resilient and profitable. Emphasis is future on secondary agriculture and specially agriculture will enable farmers to earn better income, and possibly double it.
6. In order to ensure an inclusive growth in agriculture through innovative and synergistic approaches for achieving sustainable food and nutrition security. 'Agriculture Research for Development' (AR4D) would require a paradigm shift to 'agricultural research and innovation for development' (ARI4D), with increased resource allocations, accountability and monitoring. In the process, we need to overcome complacency that has crept in the public research, education and extension system. This necessitates greater vibrancy in the National Agricultural Research and Extension System (NARES) requiring active involvement of stakeholders (farmers, NGOs, private sector, scientists and policy makers) and doubling the investments (from current 0.5 to 1.0 per cent of agricultural GDP) to remain technology wise globally competitive.
7. Towards agricultural diversification, many horticultural crops, especially perennial fruit trees, spices and plantation crops and agro-forestry species have an important role and will help also in carbon sequestration as well as mitigating climate change. Therefore, promoting agro-horticulture and agro-forestry would ensure sustainable agriculture. In addition, we shall have to promote also both urban and peri-urban agriculture. Further, adoption of post-harvest practices including grading and packaging, processing, value addition, cool chain, marketing, export etc. will ensure higher economic returns to the farmers.

8. Precision Nutrient Management, using decision support systems, aiming at targeted yields keeping in view site specific nutrient availability in the soil would help achieve much needed resilience in agriculture. We now need to ensure nutrient use efficiency. Also use of biofertilizers, organic matter recycling, conservation agriculture, organic farming etc. would help in achieving much desired environmental sustainability.
9. To address biotic stress of diseases and pests, outscaling of available Integrated Pest Management (IPM) technologies, while keeping the pests below economic threshold level (ETL) is an emerging option to be harnessed. Also increased use of biopesticides, at least upto 10% from present 3% of total pesticides used (60,000 tonnes of active ingredient) will help greatly in reducing environmental load of pesticides.
10. We also need to revisit our agricultural education system, which was largely based on land grant system, initiated in 1960, so as to reorient the same to overcome existing gaps/weaknesses for imparting quality education, both formal and informal, that is relevant to the present day needs and challenges.

The **ASM Foundation** and **Jain Irrigation System Ltd.**, are to be congratulated for organizing this conference. I am sure, your participation will enable us devise proper policy framework and an action plan. I wish the conference a great success.

Thank you.

## About Dr. Rajendra S. Paroda



Dr. Raj Paroda, former Director General, Indian Council of Agricultural Research (ICAR) & Secretary, Department of Agricultural Research and Education (DARE), Government of India, is an accomplished plant breeder and geneticist by profession and an able research administrator. He has made significant contributions in the field of crop science research. He is known for modernization and strengthening of the national agricultural research system (NARS) in India as well as in Central Asia and the Caucasus. He has the unique distinction of being the main architect of one of the world's largest and most modern National Gene Bank in New Delhi. He has received numerous awards and recognition, including Padam Bhushan, had been the founder chairman of Global Forum on Agricultural Research (GFAR). He was President of the Indian Science Congress in 2001, President of National Academy of Agricultural Sciences, and many scientific societies in agriculture. Fifteen universities have awarded him D.Sc. (Honoris Causa) degree including Ohio State University and Indian Agricultural Research Institute. He is fellow of all scientific Academies in India, besides Third World Academy of Sciences (TWAS), American Society of Agronomy, American Society of Crop Science and Agriculture Academies of Russia, Armenia, Tajikistan and Kyrgyzstan. He has also served on the Board/Management committees of various international organizations such as ACIAR, CABI, IRRI, WMO, CGIAR Fund Council and was Chairman of ICRISAT Board of Trustees. He also served for more than two decades as Executive Secretary of a vibrant regional organization: Asia-Pacific Association of Agricultural Research Institutions (APAARI). Till recently, Dr. Paroda worked for the overall benefit of farmers as Chairman, Farmers Commission of Haryana, Chairman of Working Group on Agriculture and member of Rajasthan Planning Board. Currently, he is Chairman, Trust for Advancement of Agricultural Sciences (TAAS).