

Punjab Agricultural University

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Convocation Address

2010 – Do or Die Year on the Farm Front

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I feel privileged to have been enrolled as an honorary alumnus of this University, which has been playing a significant role in shaping our agricultural destiny during the past 50 years. I congratulate all the scholars taking their degrees at this Convocation for their outstanding academic achievements. I also congratulate the parents of the graduates of the year on their choice of PAU. I wish all the outgoing alumni much personal happiness and professional satisfaction. May this year be a good one for all of you.

PAU is the flagship of our movement for agrarian prosperity through the technological transformation of farming techniques. The symbiotic bonds between PAU and Punjab farmers triggered the green revolution movement. Writing in the Illustrated Weekly of India in May, 1969, I referred to the role of Punjab farmers in creating a new confidence in our agricultural capability in the following words.

“Brimming with enthusiasm, hard-working, skilled and determined, the Punjab farmer has been the backbone of the revolution. Revolutions are usually associated with the young, but in this revolution, age has been no obstacle to participation. Farmers, young and old, educated and uneducated, have easily taken to the new agronomy. It has been heart-warming to see young college graduates, retired officials, ex-armymen, illiterate peasants and small farmers queuing up to get the new seeds. At least in the Punjab, the divorce between intellect and labour, which has been the bane of our agriculture is vanishing”

It is now 42 years since the term “green revolution” was coined by Dr William Gaud of USA, to describe advances in production arising from productivity improvement. Even in 1968. I concluded that if farm ecology and economics go wrong, nothing else will go right in agriculture. I expressed my views in the following words in my lecture at the Indian Science Congress Session held in Varanasi in January, 1968.

“Exploitative agriculture offers great dangers if carried out with only an immediate profit or production motive. The emerging exploitive farming community in India should become aware of this. Intensive cultivation of land without conservation of soil fertility and soil structure would lead, ultimately, to the springing up of deserts. Irrigation without arrangements for drainage would result in soils getting alkaline or saline. Indiscriminate use of pesticides, fungicides and herbicides could cause adverse changes in biological balance as well as lead to an increase in the incidence of cancer and other diseases, through the toxic residues present in the grains or other edible parts. Unscientific tapping of underground water will lead to the rapid exhaustion of this wonderful capital resource left to us through ages of natural farming. The rapid replacement of numerous locally adapted varieties with one or two high-yielding strains in large contiguous areas would result in the spread of serious diseases capable of wiping out entire crops, as happened prior to the Irish potato famine of 1854 and the Bengal rice famine in 1942. Therefore the initiation of exploitive agriculture without a proper understanding of the various consequences of every one of the changes introduced into traditional agriculture, and without first building up a proper scientific and training base to sustain it, may only lead us, in the long run, into an era of agricultural disaster rather than one of agricultural prosperity.”

The above analysis led me to coin the term “ever-green revolution” to describe the enhancement of productivity in perpetuity without associated ecological harm. The pathways to ever-green revolution are either organic farming or green agriculture. Green agriculture involves the adoption of environment friendly practices like integrated natural resources management and integrated pest management. I hope during this decade, PAU will become a catalyst of ever-green revolution in the farms of Punjab. For several decades to come, Punjab will remain the main provider of wheat and rice to the national public distribution system. It is therefore our sacred duty to conserve and enhance the ecological foundations such as soil, water and biodiversity essential for sustained advances in agricultural productivity and profitability.

The present decade may mark the beginning of a new climate era, characterized by extreme and often unpredictable weather conditions and rise in sea levels. The recent Climate Conference in Copenhagen unfortunately failed to get a global commitment to halt economic growth based on high carbon intensity. The Climate Conference due to be held in Mexico in December this year will probably generate the political commitment essential to restrict the rise in global mean temperature to not more than 2°C, as compared to the mean temperature of today. Even a 2°C rise will affect adversely crop

yields in South Asia and Sub-Saharan Africa, which already have a high degree of prevalence of endemic hunger. It will also lead to the possibility of small islands getting submerged. **The greatest casualty of Climate Change will be food, water and livelihood security.** Farmers of the world can help to avoid serious famines by developing and adopting climate resilient farming systems. 2010 has been declared by the United Nations as the **International Year of Biodiversity**. Biodiversity is the feedstock for a climate resilient agriculture. We should therefore redouble our efforts to prevent genetic erosion and to promote the conservation and sustainable and equitable use of biodiversity.

2010 will also witness a major Conference at the United Nations Headquarters in New York to review the progress made since the year 2000 in achieving the U N Millennium Development Goals. The first among these goals is reducing hunger and poverty by half by 2015. Unfortunately the number of hungry children, women and men, which was 800 million in 2000, is now over a billion. This is partly due to a rise in food prices, thereby making it difficult for the poor to have access to balanced diet at affordable prices. There is no time to relax and the farmers of the Punjab must redouble their efforts to increase food production through an ever-green revolution pathway of increasing productivity in perpetuity without associated ecological harm. Without the total commitment of PAU and the farmers of Punjab to the goal of producing more by adopting climate resilient farming systems, the goal of “food for all and for ever” cannot be reached in our country.

Adaptation to Climate Change:

A group of scientists led by MSSRF have undertaken studies during the last five years in Rajasthan and Andhra Pradesh on climate change adaptation measures. The districts chosen were Udaipur in Rajasthan and Mehabubnagar in Andhra Pradesh. The approach adopted was to bring about a blend of traditional wisdom and modern science through farmer participatory research. The participatory research and knowledge management systems adopted under this programme during the past five years have provided many useful insights for developing a climate resilient farming and livelihood security system. Five of the meaningful adaptation interventions were the following.

- **Water conservation and sustainable and equitable use:** Families in the desert regions of Rajasthan have long experience in harvesting every drop of rain water and using it economically and efficiently both for domestic and agricultural use. The traditional methods were reinforced with modern scientific knowledge, like the gravity flow method of water management.

- **Promoting fodder security:** Livestock and livelihoods are intimately related in arid and semi-arid areas. The ownership of livestock is also more egalitarian. The sustainable management of common property resources, particularly pasture land, is essential for ensuring fodder security. Therefore, high priority was given to the regeneration of pasture land and the equitable use of grazing land.
- **More crop and income per drop of water:** In areas where water for irrigation is the constraint, it is important that agronomic techniques which can help to increase yield and income per drop of water are standardized and popularized. One such method introduced under this project is the System of Rice Intensification (SRI). SRI was popularized in Andhra Pradesh, since this system of water and crop management helps to reduce irrigation water requirement by 30 to 40%. This method thus helps to avoid the unsustainable exploitation of the aquifer.
- **Weather Information for All and Climate Literacy:** What farmers need is location specific meteorological information at the right time and place. Generic weather data will have to be converted into location-specific meteorological advice. For this purpose, mini-agro-meteorological stations managed by the local community were established. This has helped to impart to Climate Literacy as related to food, water and livelihood security.
- **Strengthening Community Institutions:** Effective implementation of adaptation measures will need active group cooperation and community participation. Steps were taken to involve the grassroot democratic institutions like **Panchayats** and **Gram Sabhas**. Also, Smart Farmers' Clubs were organized to give the power of scale in water harvesting, soil health management and other adaptation measures undertaken by farmers with small holdings.

The above interventions were supported by training and skill development and education and social mobilization. A Training Manual was prepared by MSSRF for training one woman and one male member of every Panchayat as **Climate Risk Managers**. Such local level Climate Risk Managers will be well trained in the art and science of managing weather abnormalities. The work has highlighted the need for location specific adaptation measures and for participatory research and knowledge management. The adaptation interventions have also highlighted the need for mainstreaming gender considerations in all interventions. Women will suffer more from Climate Change, since

they have been traditionally in charge of collecting water, fodder and fuel wood, and have been shouldering the responsibility for farm animal care and post-harvest technology. **All interventions should therefore be pro-nature, pro-poor and pro-women.**

The last five years have been an extremely rewarding learning period. The results and experience have shed light on the way forward. It is clear that to promote location specific and farmer-centric adaptation measures; India will need a Climate Risk Management Research and Extension Centre at each of the 127 agro-ecological regions in the country. Such centres should prepare Drought, Flood and Good Weather Codes what can help to minimize the adverse impact of abnormal weather and to maximize the benefits of favourable monsoons and temperature. Risk surveillance and early warning should be the other responsibilities of such centres. Thus the work done so far has laid the foundation for a **Climate Resilient Agriculture Movement** in India. The importance of such a Movement will be obvious considering the fact that 60% of India's population of 1.1 billion depend upon agriculture for their livelihood. In addition, India has to produce food, feed and fodder for over 1.1 billion human, and over a billion farm animal population.

Challenges Ahead:

2010-11 is a watershed year in the history of Indian agriculture. **Producing food in adequate quantities and making them available at affordable prices will be the greatest challenge during this year.** Also, our food security should be built on the foundation of home grown food, since agriculture is the backbone of the livelihood security system of nearly 700 million people in the country. Nearly 60 per cent of the cultivated area is rainfed and these are the areas where pulses, oilseeds and other crops of importance to nutrition security such as millets are grown. I need hardly emphasize that India is the home for the largest number of malnourished children, women and men in the world. The majority of the malnourished are producer-consumers (ie, farmer-consumer) and landless labour. Increasing the productivity and profitability of small farms is the most effective method of achieving the UN Millennium Development Goal No. 1; ie, reducing hunger and poverty.

Road Map:

A road map for our agricultural renaissance and agrarian prosperity was presented by the National Commission on Farmers (NCF) in their 5 reports presented between 2004-

2006. The reports are yet to be printed, let alone implemented. For example, 70 per cent of India's population do not find a place in the Padma awards announced on January 26 each year, although the NCF had stressed the need for according social prestige and recognition to farmers through such gestures. Farming, particularly in the heartland of the green revolution comprising Punjab, Haryana and Western UP is in deep ecological and economic crises. No wonder over 40 per cent of the farmers surveyed by NSSO wish to quit farming, if there is another option. Some of the areas needing immediate attention and action are the following:

- **Defending the gains already made in the green resolution areas through Conservation Farming**, involving concurrent attention to soil health enhancement, water conservation and effective use, biodiversity protection and launching of a **Climate Resilient Agriculture Movement, is an urgent task.** These are the areas which feed the public distribution system. NCF had recommended the allocation of Rs.1,000 crore for this purpose. Expenditure in this area will also come under the **Green Box** provision of WTO. Climate resilient agriculture will involve shifting attention to per day rather than per crop productivity.
- **Extending the gains to eastern India, the sleeping giant of Indian Agriculture:** Bihar, Chattisgarh, Jharkhand, eastern UP, West Bengal, Assam and Orissa have immense untapped production potential. A large number of GOI schemes with a substantial financial outlay, like the Rashtriya Krishi Vikas Yojana, Food Security Mission, and National Horticulture Mission exist, but are not making the desired impact on the productivity and production of small farmers. A well planned **“Bridge the Yield Gap Movement”** needs to be initiated with the active involvement of farming families, Gram Sabhas need to be involved in finalizing the components of the **Bridge the Yield Gap Movement.** The different agencies involved in this task should adopt a **“Deliver as one”** approach with the help of Gram Sabhas.
- **Enhancing the productivity of dry farming areas:** The gap between potential and actual yields with the technologies on the shelf ranges from 200 to 300 per cent in these areas. Prime Minister Rajiv Gandhi initiated a dry land farming revolution in these areas through the Pulses and Oilseeds Missions, but the end to end approach he had designed was soon given up and there was a reversion to the business as usual approach. I suggest that during 2010-11, **60,000 Pulses and Oilseed Villages may be organized in rainfed areas,** to mark the 60th

anniversary of our Republic. In each of these villages, there should be a **Lab to Land** programme organized by the ICAR and Agricultural Universities. These **Pulses and Oilseed Villages**, may be developed with the help of Gram Sabhas and with the active involvement of farm scientists with the requisite knowledge and experience. NREGA workers can help in water harvesting, watershed management and soil health enhancement. Such villages should pay integrated attention to conservation, cultivation, consumption and commerce. Assured and remunerative marketing will hold the key to stimulating and sustaining farmers' interest. Today, the consumer is paying very high prices for pulses, but the producer lives in poverty.

- **Mahila Kisan Sashaktikaran Pariyojana:** In 2004-05, 49% of male workers and 65% of all women workers were in agriculture (NSSO 2004-05). 83% of rural female workers are engaged in work related to crop and animal husbandry, fisheries and forestry. Farm size is declining and 70% operated less than 1 ha in 2003, compared with 56% in 1982. **Conferring the economy and power of scale to farm families with small holdings is the most serious challenge facing our agriculture.** Cooperative Farming has been successful in the dairy sector in Gujarat and a few other States. It has not been successful in crop husbandry, although Andhra Pradesh has recently initiated a programme for promoting farm cooperatives. There is increasing feminization of agriculture as well as NREGA. Gender specific needs of women farmers, including credit, technology, training and support services like crèches and day care centres, are urgently needed. I therefore suggest that a **Mahila Kisan Sashaktikaran Pariyojana** may be initiated during 2010-11. The implementation could be through the women members of Panchayats and Women Self-help Groups.
- **Yuva Kisan and Agricultural Renaissance:** Nearly 70 percent of our population is below the age of 35 and 70 per cent of them live in villages. **The future of our agriculture will depend upon attracting and retaining youth in farming.** This is one of the principal goals of the National Policy for Farmers (2007). There are several government projects, which if revamped and revitalized, can help to make farming as a profession attractive to educated youth. A new programme for youth in agriculture may be initiated by integrating several ongoing schemes like the **Small Farmers' Agri-business Consortium (SFAC)**, Agri-Clinics, Agri-business Centre, Food Parks, etc, This will help to stimulate the formation of Young Farmers' Self help Groups. SFAC could be developed into a **Young**

Farmers Agri-business Consortium, bringing together all relevant programmes.

Climate change and Food and Water Security: Food and water security will be the major causalities of a rise in mean temperature, monsoon uncertainty, drought, floods and sea level rise. Some of the steps which could be initiated during 2010-11 are:

- Promoting a water conservation pond as well as a biogas plant in every farm, whenever farmers have farm animals.
- Plant one billion fertilizer trees which can serve as **soil carbon banks**, enrich soil fertility and enhance farm productivity. Funds for this purpose (Rs. 13,000 crore) are available with the Ministry of Environment and Forest under the Compensatory Afforestation Fund Management and Planning Authority (CAMPA).
- Establish **Farmer Participatory Research and Training Centres for Climate Change Management in each of the 127 agro-climate zones of the country**. Such centres will train at least 1 woman and 1 man in every Panchayat as Climate Risk managers. The centres can be located in either Agricultural and Animal Sciences universities or Krishi Vigyan Kendras or ICAR Institutes.
- **Building Mangrove and Non-mangrove Bioshields along the Coast:** These are essential for reducing damage from sea level rise, cyclones and tsunamis. Along with the bioshields, 1000 **Sea Water Farming** demonstrations can be organized. Sea water is a social resource, as stressed by Mahatma Gandhi, when he launched the salt satyagraha. Sea water farming will involve the establishment of agri-aqua farms. The Farmer Participatory Demonstrations could be organized along our coast as well as in the Lakshadweep and Andaman group of islands.

National Grid of Ultra-modern Grain Storages: During this year, we should begin establishing ultra-modern grain storages at least in 50 locations in the country, each with a storage capacity of a million tonnes of food grains (ie, a 50 million tonnes storage grid). **Government should remain at the commanding height of the food security system.**

2010 is a do or die year for Indian agriculture. If we don't take steps to address the serious ecological, economic and social crises facing our farm families, we will be forced to support foreign farmers, through extensive food imports. This will result in a rise in food inflation, increase the rural-urban and rich-poor divides and allow the era of farmers' suicides to persist. On the other hand, we have a unique opportunity for

ensuring food for all by mobilizing the power of **Yuva and Mahila Kisans** and by harnessing the vast untapped yield reservoir existing in most farming systems through synergy between technology and public policy.

Overcoming hidden hunger caused by micronutrient deficiencies like iron, iodine, zinc, Vitamin A and Vitamin B12 can be achieved by growing and consuming appropriate local vegetables and fruits. There is a horticultural remedy for every nutritional malady. **Moringa**, which is a jewel in the horticultural crown, is an example.

Urban and non-farming members of the human family should realize that we live on this planet as the guests of sunlight and green plants, and of the farm women and men who toil in sun and rain, and day and night, to produce food for over 6 billion people, by bringing about synergy between green plants and sunlight. Let us salute the farmers of the world and help them to help in achieving the goal of a hunger free world, the first among the U N Millennium Development Goals.

The National Policy for Farmers (2007) calls for a paradigm shift from measuring agricultural progress solely in terms of production, to assessing advances in agrarian prosperity. It calls for steps to attract and retain youth in farming. For this purpose, the National Commission on Farmers appealed to our Agricultural Animal Sciences and Fisheries University to adopt and implement the motto, “**Every scholar an entrepreneur**”. Currently, 57% of our population depends upon agriculture for their livelihood, but the contribution of agriculture to GDP has been going down and is at present about 18%. As men migrate to towns and cities in search of jobs, there is increasing feminization of agriculture.

NCF recommended group farming through self-help groups and contract farming, if it represents a win-win situation for producers and purchasers. In a recent article in the Economic and Political Weekly (2010), Bina Agarwal has pointed out that collectivities of small farmers can help to improve their economic well being. We need urgently a **Small Farm Management Reform** and PAU can show the way.

This decade will show that the future belongs to Nations with grains and not guns. Human destiny during this decade and beyond will be shaped by farm women and men. This Decade will thus be the **Decade of Farmers**.