28th Convocation of
Dr. Panjabrao Deshmukh Krishi Vidyapeeth

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Realising Dr Panjabrao Deshmukh's Vision of a Food Secure India

Convocation Address

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Hon'ble Pro-chancellor of the University Sh. Radhakrishana Vikhe Patil, State Minister for Agriculture and Marketing, Govt. of Maharashtra. Hon'ble Vice-Chancellor of this esteem University Prof. Raviprakash Dani, Chief Guest of today's Convocation Dr.Yashwant Thorat , former Vice-Chancellors, Members of the Executive Council, Academic Council, Board of Studies, Faculty, distinguished dignitaries, invitees, Candidates receiving Degrees and Honours, farmers, Journalists, Media Core, Ladies, Gentlemen and students.

I am very happy to be here on the occasion of the 28th Convocation of this University, which bears the name of one of the architects of modern agriculture in India. Dr Panjabrao Deshmukh laid the foundation for accelerating agricultural progress in our country during the 1950s and early 60s. He had a strong faith in science and technology as prime movers of change in farmers' fields. In order to highlight the importance of technology, he organized the World Agriculture Fair in 1958. This Fair was opened jointly by Gen Dwight D Eisenhower, then President of the United States and Pandit Jawaharlal Nehru, the then Prime Minister of India. In order to give voice to farmers in policy making, Dr Panjabrao organized the Bharat Krishak Samaj, which is still functioning effectively. In his monthly letters to the Agriculture Ministers of State Governments, Dr Deshmukh described in precise terms the action that should be taken during that month to assist farm families to manage the monsoon. He used to stress that the monsoon and the market are the two major determinants of a farmer's well being. I am particularly happy that this Convocation is being held in the International Year of Family Farming.

I congratulate the Vice Chancellor, the Board of Management, Faculty and Staff of this University on their tireless efforts to take this University to a preeminent position among the agricultural universities of our country. My congratulations go to all the alumni who are taking their degrees today. You have worked hard and proved yourself worthy of holding the degrees of PKV. I also thank the parents of the students who are taking degrees at this Convocation, for their support and often sacrifice which has made it possible for their children to take to education at PKV and become masters of the art and science of agriculture. I would like to take this opportunity to share some of my views on our agricultural future.

Agriculture and food security have been intertwined throughout human history. Agricultural growth is critical for improving food security, most immediately by increasing food production and availability. Agriculture helps to grow crops and livestock for food and industrial raw materials and is the main source of calories for the world's population. The availability of food is a necessary but not a sufficient condition to assure food security.

A considerable segment of the world population, particularly women and children, suffer from the following three major kinds of endemic hunger:

(1) Calorie deprivation arising from poverty induced under-nutrition;
(2) Protein hunger caused by inadequate consumption of pulses or milk, fish and meat and
(3) Hidden hunger caused by the deficiency of micronutrients in the diet.

FAO's most recent estimates indicate that 12.5 percent of the world's population (868 million people) are undernourished in terms of energy intake, yet these figures represent only a fraction of the global burden of malnutrition. An estimated 26 percent of the world's children are stunted, 2 billion people suffer from one or more micronutrient deficiencies and 1.4 billion people are overweight, of whom 500 million are obese. Most countries are burdened by multiple types of malnutrition, which may coexist within the same country, household or individual. The social cost of malnutrition, measured by the "disability-adjusted life years" lost to child and maternal malnutrition and to overweight and obesity, are very high. Beyond the social cost, the cost to the global economy caused by malnutrition, as a result of lost productivity and direct health care costs, could account for as much as 5 percent of global gross domestic product (GDP), equivalent to US$3.5 trillion per year or US$500 per person. The costs of undernutrition and micronutrient deficiencies are estimated at 2–3 percent of global GDP, equivalent to US$1.4–2.1 trillion per year. (FAO State of Food Insecurity in the World, 2013)

The internationally accepted definition of food security is that emerging from the World Food Summit of 1996: "Food security exists when all people, at all times, have physical and economic access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences for an active and healthy life." This definition reinforces the multidimensionality of food security—availability, access, and absorption/utilization of food:

- ***Availability*** refers to the physical availability of food in desired quantities as determined by production net of feed, seed, and wastage plus net imports and draw-down of stocks. As noted in the World Food Summit definition, food security also depends upon the ability to obtain food at all times, including through economic or climatic shocks or non-harvest seasons, as well as the availability of locally acceptable foods, as compared to taboo foods which may be proscribed on the basis of culture, religion, health, or economic value

- ***Access*** is determined by the bundle of entitlements related to people's initial endowments and what they can acquire, especially in terms of physical and economic access to food
- ***Absorption*** is the ability to biologically utilize the food consumed, which in turn is related to the availability of safe drinking water, sanitation, hygienic environment, primary health care, and nutritional knowledge. This broadening of food security toward nutrition security is a recent evolution.

The problem of hunger is not simply a lack of sufficient quantities of food. The chronic hunger caused by protein and calorie undernutrition is exacerbated by malnutrition (the "hidden" hunger caused by the deficiency of micronutrients, which include iron, iodine, zinc, vitamin A, and vitamin B12) and sometimes by human diseases that disable the body's ability to absorb what micronutrients it receives. To address such intertwined problems, there must be synergy among national programs dealing with the availability, access to, and absorption of food. These nutrition security programs should be based on a life-cycle approach that starts with the "first 1000 days" from pregnancy to 2 years old, the critical period when stunting can cause irreversible damage, including impaired cognitive ability.

In September 2012, a High Level Panel of Experts to the United Nations (UN) Committee on World Food Security, which I chaired, released a comprehensive report on *Social Protection for Food Security*, with recommendations for combating chronic childhood hunger. One of its recommendations—the concept of a **"food security floor"**—is particularly worthy of mention. The food security floor recognizes that freedom from hunger is a fundamental human right, defining the minimal steps needed for hunger elimination. These include nutrition literacy, clean drinking water, sanitation, and primary health care. In some "hunger hot spots" of the world where agriculture is the backbone of survival, as in sub-Saharan Africa and South Asia, mainstreaming nutrition in agriculture programs is the most effective and low-cost method of eliminating malnutrition. This requires greater attention to the net income of smallholder farmers, whose women food producers have particular needs that require specific policies and support.

The challenge before us is the development and adoption of agricultural strategies which can help alleviate poverty and malnutrition. The traditional role of agriculture in producing food and generating income is fundamental, but agriculture and the entire food system – from inputs and production, through processing, storage, transport and retailing, to consumption – can contribute much more to the eradication of malnutrition.

Following the green revolution whose thrust was on increasing production through the productivity pathway, agriculture evolved in the decade of the 1970s to include environmental and equity considerations. Sustainable development issues came to the forefront, partly in response to concerns associated with the Green Revolution such as the overuse of agricultural chemicals, the depletion of scarce water resources, and the neglect of farmers and communities in policy-making processes. These concerns encouraged a shift away from a narrow focus on increasing staple food productivity to a more complex perspective on agriculture and rural development. This latter approach coupled intensive

agricultural practices with integrated pest management practices, improved water management practices, precision farming, and other tools and techniques that facilitated stewardship of natural resources. Efforts were accelerated to make the Green Revolution not only more sustainable but more pro-poor. New policies, programs, and investments were specifically designed to integrate rural communities into decision making processes about their own agricultural and rural development as a way of addressing sustainability along with equity issues. There was growing attention on land reform, especially the equitable distribution of land with secure property rights, access to credit and financial services, and programmes more geared toward small-scale farmers.

In recent years, the medical community has begun to pay more attention to the linkages between agriculture, nutrition, and health. There is increasing recognition that agriculture plays a central role in the production, access, and use of nutritious and safe food. It also influences other determinants of nutrition, such as access to clean water and sanitation. Health is now considered a major goal of food systems, in part because of the triple burden of malnutrition: hunger, nutrient deficiencies, and excess calorie intake that leads to overweight and obesity in many countries.

The Secretary General of the UN Ban Ki-moon, launched a 'zero hunger challenge' at the Rio+20 conference on sustainable development held in Brazil in June 2012. At a high level consultation held in Madrid, Spain, in April 2013, it was agreed that the world community should commit to a common vision that hunger, food insecurity and malnutrition should be ended by 2025. At these meetings, governments were requested to pay concurrent attention to the following five pillars of the 'zero hunger challenge' — 100 per cent access to adequate food all year round; zero stunted children less than two years of age; all food systems are sustainable; 100 per cent increase in smallholder productivity and income; and zero loss or waste of food.

Looking back on India's progress on the agriculture front since 1947, India has gone through four distinct phases in its agricultural evolution.

- **Phase I (1947–64):** The emphasis was on the development of infrastructure for scientific agriculture—establishment of fertilizer and pesticide factories, construction of large multi-purpose irrigation-cum-power projects, organization of community development and national extension programs, and initiation of agricultural universities. Still, the growth in food production was inadequate to meet the consumption needs of the growing population, and food imports became essential.
- **Phase II (1965–85):** The emphasis was on maximizing the benefits of the infrastructure created during Phase I, particularly in irrigation and technology transfer. The reorganization and strengthening of agricultural research, education, and extension along with the creation of institutions for providing farmers assured marketing opportunities and remunerative prices for their produce led to a quantum jump in the productivity and production of crops such as wheat and rice, a phenomenon christened in 1968 as the Green Revolution.

- **Phase III (1985–2000):** Organization innovations such as Technology Missions were introduced—the Mission approach involved concurrent attention to conservation, cultivation, consumption, and commerce. This period saw a gradual decline in public investment in irrigation and the infrastructure essential for agricultural progress as well as a gradual collapse of the cooperative credit system. Large grain reserves led to a mood of complacency toward agriculture.
- **Phase IV (2001 to present day):** Recent steps, seek to revitalize agriculture through several initiatives, including the Mahatma Gandhi National Rural Employment Guarantee Act. Also being discussed are policies to address the mismatch between production and post-harvest technologies by way of improving of storage facilities.

The Indian enigma is the persistence of widespread undernutrition in spite of substantial progress in agricultural production. Agricultural growth has led to great strides in food production in India, but chronic undernutrition persists.

One part of the solution to this enigma likely involves focusing on crops and livestock that have large nutritional impacts on both farmers and consumers. Another part may involve addressing socio-economic factors that affect the link between agriculture and nutrition, including the distribution of assets, particularly land; the role of women; rural infrastructure; and rural health and sanitation. The Women Farmers' Entitlements Bill of 2011 that I introduced during my tenure as a Member of the *Rajya Sabha*, was introduced in the Indian Parliament with the aim of establishing women farmers' rights to agricultural inputs, land, water, credit, technology and market.

I have also been involved in the development of two other policy initiatives to tackle this situation. First, the National Food Security Bill (2013) has included nutri-millets in the public distribution system (PDS). These underutilised or orphan crops (referred to officially as 'coarse cereals') will be made available at Rs 1 per kg. This will open up greater market opportunities for these nutritious and climate smart cereals, thereby providing an incentive to both conserve and cultivate them. The greater the opportunity for remunerative marketing, the greater will be the interest of the farm families in the agro-biodiversity hotspot areas to conserve them. Hence, the widening of the food basket to include millets in the PDS is an important step in converting 'hotspots' into 'happy spots'. Secondly, the Union finance ministry provided Rs 200 crore in the budget for 2013-14 for starting a pilot programme on nutri-farms. In such nutri-farms, crops rich in micronutrients like iron-rich *bajra*, protein-rich maize, vitamin A-rich sweet potato and zinc-rich wheat will be introduced.

We have to understand that India will remain a predominantly agricultural country for much of the twenty-first century, particularly with reference to livelihood opportunities. Enhancing small farm productivity and profitability will likely make a major contribution to reducing hunger and poverty. An integrated crop–livestock–fisheries farming system is the way forward for the country. This calls for an Evergreen Revolution (i.e. increase in productivity in perpetuity without associated ecological harm), focused on rain-fed farming areas and crops suited to these areas. The technology required has three components: (i)

defending the gains — through soil health enhancement, water harvesting and management, credit and insurance, technology and inputs, and remunerative marketing; (ii) **extending the gains** — through an appropriate mix of technology, services, and public policies; and (iii) **making new gains** — through improvement in post-harvest technology, agro-processing, genomics and gene pyramiding, and integrated asset reform aimed at equitable land distribution and utilization of water.

Particular attention is needed to agro-biodiversity hotspots. Predominantly inhabited by tribals, these areas are characterised by culinary and curative (medicinal plants) diversity. Women play a key role here. Over centuries, they have conserved for public good, at personal cost, rich genetic variability. More recently, the government, through the National Plant Variety Protection and Farmers' Rights Authority, has started recognising their contributions through the genome saviour award. The following issues are relevant in this context:

1. Commercialisation as a trigger to conservation — we need to standardise methods of creating an economic stake in conservation, thereby helping to improve the economic well-being of the primary conservers.
2. Methods of promoting integrated attention to conservation, cultivation, consumption and commerce, in order to ensure that a representative sample of existing genetic diversity in preserved for posterity.
3. Strategies for marrying nutrition and agriculture, so that nutri-farms can be promoted. (4) Promoting farming systems for nutrition (FSN) which can provide agricultural/horticultural remedies to the prevailing nutritional maladies. As an example, the M.S. Swaminathan Research Foundation in Chennai, India, has designed a Farming System for Nutrition initiative, comprising specific steps and is implementing it in Koraput district of Odisha and Wardha district here in Vidarbha. They include carrying out a nutritional survey of the area and identifying the major causes of chronic and hidden hunger, and redesigning the farming system so that specific agricultural remedies are introduced for each nutritional malady, such as the cultivation of bio-fortified crops and crop-livestock integration.

Indian agriculture has now assumed a legal responsibility, since the National Food Security Act 2013, commits itself to a legal access to food to a majority of our population. The right to food can be fulfilled only with home grown food, since international prices are very volatile. Unlike other rights, like the right to information which can be redeemed with the help of files, the right to food can implemented only with the help of farmers. This is why we have to redouble our efforts in helping farmers to overcome the many challenges they face in producing more food and other agricultural commodities from diminishing per capita land and water resources.

The National Food Security Act 2013 mandates the government to procure wheat, rice, and nutri-millets (often called coarse cereals). **Such procurement at a remunerative price is the pathway for stimulating interest among farmers to produce more.** India is also just beginning to uncover the potential of agri-business, diversification, marketing and exports, as well as increasing the value addition to food production. The country is

exploring whether, with proper protections for the poor and vulnerable, commercial agriculture can be a catalyst for economic development. Also, climate change, manifested in adverse alterations in temperature, precipitation and sea level, will add to the problems of farmers and farming. What steps should we take to ensure sustainable advances in agricultural productivity and production?

In my view, we should attend to six key areas to safeguard the stability and sustainability of agricultural production in our country.

First, we should ensure that soil health is not only conserved but improved continuously. This will require concurrent attention to the physics, chemistry and microbiology of soils. Also, we should take steps to ensure that good farm land is conserved for agriculture.

Second, irrigation security will have to be ensured through integrated attention to harnessing rainwater, river and other surface waters, ground water, treated waste water and sea water. Rain water harvesting should be made mandatory both in rural and urban areas.

Third, technology and inputs need to be tailored to the agro-ecological and socio-economic conditions under which farmers work. Technology is the prime mover of change and a technology upgrading of agricultural practices via the introduction of biotechnology, IT and proper agricultural mechanisation is essential to attract and retain youth in farming.

Four, farmers should receive appropriate credit and insurance support. Credit should be made available at 4 per cent or even lower interest rates as recommended by the National Commission on Farmers (NCF). Insurance procedures should promote group insurance on an agro-ecological basis. Government should promote an **Indian Single Market**, so that agricultural commodities can move across state frontiers without hurdle. This single step would help to eliminate a major cause of price volatility particularly perishable commodities like tomato, onion and potato.

Five, assured and remunerative marketing ultimately holds the key for economically viable agriculture. Procurement at the minimum support price (MSP) is the greatest incentive to farm families. The MSP should be C2 plus 50 per cent as recommended by NCF. The WTO regulations may come in the way of providing our small farmers prices which can help to keep them above the poverty line. We should take the stand at WTO negotiations that in the case of countries like India, where over 50 per cent of the population depend for their livelihood on crop and animal husbandry, fisheries and agro-forestry, there should be a **Livelihood Security Box** on the lines of the green box provisions, which are being taken advantage of by industrialised countries to provide high subsidies to their farmers. A hunger-free India is a goal which is non-negotiable.

Finally, there is need to give the power and economy of scale to small holders. This can be in the form of cooperatives, which have been very effective in the dairy sector or producer companies. Group farming through self-help groups can also be promoted. Today, the small farmer has neither the holding capacity nor bargaining power to ensure that he is able to

get a reasonable price for his produce. Also, some kind of group cooperation is essential to promote ecologically sustainable production measures like integrated pest management, scientific water management, and improved post-harvest management.

The green revolution of the 1960s, which helped us to bid goodbye to a ship-to-mouth existence, and launch a right to food with home grown food movement, was the result of a symphony approach with all the main stakeholders participating in a cooperative manner. It is only synergy between technology and public policy that can safeguard the future of our agriculture and help us generate a malnutrition free India symphony. Technology will help to ensure the ecological sustainability of the production pathway; and pro-nutrition agriculture strategies and public policy will ensure the economic viability of farming through appropriate input and output pricing policies.

2014 is the international year of family farming and we have the largest number of family farmers in the world. As a part of our response to the zero hunger challenge, we should initiate next year **"every family farm a nutri-farm"** movement. Such a movement should have the following strategies:

(1) Enhance productivity and profitability of small holdings.
(2) Eliminate protein hunger through the production and consumption of pulses, milk and egg, among others.
(3) End micro-nutrient malnutrition through the use of naturally occurring and biofortified crops.
(4) Mobilise all government programmes to end hunger and issue every family with a Nutrition Entitlements Passbook.
(5) Bring about convergence and synergy among food and non-food factors such as the benefits of the Rajiv Gandhi Drinking Water Mission, Mahatma Gandhi Total Sanitation Programme and National Rural Health Mission, among others.
(6) Integrate the gender dimension in all interventions and pay particular attention to pregnant women and to the first 1,000 days in a child's life.

A resource centre should be developed in every village to derive benefit from the agro-biodiversity and nutritional knowledge of tribal and rural women. The major goal of this initiative should clearly be of conserving, cultivating and consuming diversity in order to address the twin challenges of poverty and malnutrition.

2016 will be International Year of Pulses. During that year we should bridge the demand-supply gap in pulses. Also, we should propose to the United Nations, to declare one of the years during this decade as the **'International Year of Underutilised Crops'**.

To sum up, Indian agriculture has undergone considerable technological and management transformation since 1947, when the country gained independence. The human population, which was about 350 million then, has now reached 1.2 billion. There is hence no time to relax. Jawaharlal Nehru said in 1947, "Everything else can wait, but not agriculture," and that message is even more relevant today. It will, therefore, be appropriate that during

2014 we convert Lal Bahadur Shastri's slogan "*Jai Kisan*" into a reality and focus our energies on realizing the goal of a hunger and malnutrition free India.

Above all, the lead given by Dr Panjabrao Deshmukh in the area of bridging the gap between scientific know-how and farmers' do-how should be followed. Dr Panjabrao Deshmukh was a great advocate of the technological upgradation of small farms and he organized an **"Atoms on the Farm"** exhibition at the World Agriculture Fair in 1958, in order to raise awareness on the relevance of nuclear technology in scientific agriculture. Molecular genetics has made it possible to overcome calorie deprivation, protein hunger and hidden hunger caused by deficiencies in micro-nutrients. Today, we see great divergence in perception concerning the risks and benefits associated with genetic modification involving recombinant DNA technology. Agricultural Universities and Biotechnology Research Institutes should follow Dr Panjabrao Deshmukh's example and organize in various parts of the country exhibitions on the theme **"Molecules on the Farm"** to bring out the uncommon opportunities opened up by new genetic combinations for facing the challenges of climate change, environmental degradation and malnutrition.

The future belongs to Nations with grains and not guns. We cannot implement the legal commitment to ensure the right to food without accelerated efforts in improving the productivity, profitability and sustainability of Family Farms. I wish you all great success in this challenging task.

Let me congratulate all outgoing alumni once again on your academic accomplishments. I wish you a bright and meaningful professional career and much personal happiness.