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Convocation Address



Dr. P. K. Joshi

Director,
National Academy of Agricultural Research
Management, ICAR, Hyderabad

JUNAGADH AGRICULTURAL UNIVERSITY
JUNAGADH

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**National Academy of Agricultural Research Management
Hyderabad - 500 407, Andhra Pradesh**

Her Excellency, the Governor of Gujarat State and Chancellor of Junagadh Agricultural University, Shrimati Kamla, Hon'ble Minister of Agriculture, Cooperation, Animal Husbandry, Fisheries and Cow Breeding, Government of Gujarat, Shri Dileep Sanghani ji, Vice Chancellor of Junagadh Agricultural University, Dr. N.C. Patel, Members of Board of Management, Academic Council, learned faculty, dignitaries, dear students, representatives of press and media, ladies and gentlemen!

I am honored to be with you in this memorable convocation of this prestigious and fast upcoming agricultural university in the country. I sincerely thank to the honorable Vice Chancellor and the Academic Council of the university, for inviting me to deliver the convocation address on this special occasion.

Convocation day is the most cheering day for all those who receive their degrees. I congratulate to all those who are receiving their degrees today. This day allows all of you to enter in a new world; a real life world, which is full of challenges and opportunities. Your education and higher degree will open enormous opportunities for you in a well integrated world. I also complement their teachers, parents and all those who contributed in nurturing these young awardees, who will be flourishing in their own ways, and contributing in nation building process.

Agriculture is the noblest profession in the world. It

vanishes hunger irrespective of administrative and political boundaries in the world. By choosing this noble profession, you have favoured the mankind. Through this profession, you are not only ensuring your own livelihood security but also of all those who are dependent on agriculture, especially the poor farmers. You are now going to be respected because of your higher level of knowledge and accomplishments. There is a saying in Sanskrit, which I quote, "The eldest is respected in his house, the headman in his village. A king is respected in his country, but the learned everywhere." As a learned person, you must take a resolution today that the knowledge, which you have acquired from this 'great temple of learning', will be used for the welfare of poorest of the poor, and bring smiles on the faces of deprived and underprivileged.

Agriculture, in the present context, is in deep crisis. All of you have to play an important role in transforming Indian agriculture from its present crisis to a remunerative, lucrative and responsive sector. It is in this context, I have chosen a topic, entitled **'Challenges and Opportunities before Indian Agriculture' for this memorial event.**

1. Background

Indian agriculture is gradually transforming towards commercialization, diversifying in favor of high-value commodities and integrating with the global markets. But there is widespread unrest and distress among farmers as their incomes are not keeping pace with that of non-agricultural sectors. The overall economic growth was consistently more than 8 percent during the last five years¹ yet agriculture was performing poorly where more

¹This year the economic growth dipped to about 7 percent due to global recession.

than 52 percent population is dependent on livelihood. Growth in agriculture sector was 2.9 percent per annum during 2000-06 period when overall economy grew at the rate of 6.88 percent. With exceptions of last three years, agriculture did not receive due attention in the country. Most of the reforms were initiated in non-agriculture sector while agriculture was just at the receiving end and remain at the cross roads of challenges and opportunities.

An attempt has been made to articulate key challenges and highlight opportunities before Indian agriculture. The list is not exhaustive but indicative of key challenges and opportunities. A way forward to alleviate challenges and harness opportunities is also proposed so as to accelerate agricultural growth and augment farm income.

2. Challenges before Indian Agriculture

Indian agriculture is confronted with numerous challenges. These are both inherited and recent ones caused due to number of exotic forces. In this section three main challenges are discussed: (a) problem of smallholders; (b) declining investment and rising subsidies; (c) rising food prices; and (d) deteriorating quality of natural resources. Challenges related to climate change, risks in production and marketing, and grain management are not being covered in this section.

a. Smallholder agriculture

Indian agriculture is characterized by the smallholders cultivating small pieces of lands. The average size of land holding which used to be 2.30 ha in 1970/71 has reduced to 1.32 ha in 2000/01 due to law of inheritance. Ironically, if same trend continues, the average size of land holding in India will reduce to 0.68 ha in 2020

and 0.32 ha in 2030. About 82 percent farmers in India possess land below 2 ha. The average size of holding of smallholders is as low as 0.63 ha in 2000/01. Further disaggregating the land holdings to marginal farmers (owning land less than 1 ha), which account for about 60 percent farm holdings, the average size of land is low as 0.4 ha. Such tiny pieces of land may not be sustainable and economically viable with the type of production portfolio and market access.

The land distribution is highly skewed and uneven. About 80 percent of the bottom category of farmers own only 39 percent of land; while top 6 percent of farmers (owning land >4 ha) command about 37 percent of the total operated area in 2000/01. In 1970/71, bottom 70 percent holdings owned 21 percent land, while top 15 percent holdings operated 61 percent of area. This clearly shows that smallholders increased from 70 to over 80 percent in three decades and their operational area expanded from 21 to 39 percent. In contrast, the large farmers reduced from 15 to 6 percent in three decades, their operational area also reduced from 61 to 37 percent. Though disparities in ownerships have reduced but resulted in converting large number of smallholders with fragmented holdings. The changing land structure needs to be viewed seriously. The smallholders though more efficient in production, their high transaction costs in accessing input and output markets and low volume of production makes them inefficient.

Therefore, there is a need to arrest the declining tendency of size of land holdings and make smallholders economically viable and sustainable. Failing to correct the existing trends in land structure would mar the efforts of accelerating agricultural growth.

b. Declining investment and rising subsidies

Sustained increase in investment and gradual phasing of subsidies is necessary condition for improving efficiency and accelerating agricultural growth. Unfortunately, it did not happen but its opposite was experienced in Indian agriculture. Budgetary subsidies to agriculture have increased from about 3 percent of agricultural GDP in 1976-80 to about 7 percent in 2001-03 (Government of India 2007). On the other hand, during the same period, the public investment in agriculture declined from over 4 percent of agricultural GDP to 2 percent. Such a trend has serious implications on the long term growth prospects of agriculture sector². The share of public investment in agricultural GDP has fallen from 5 percent during 1980/81-1984/85 to 1.8 percent in 2000/01, and then reversed to 3.0 percent in 2006/07. Despite increased emphasis in public investment, its share in GDP is yet to reach the level in 1980/81-1984/85 period. It is welcoming that private sector investment in agriculture has grown rapidly, and its share in agricultural GDP reached to 9.2 percent in 2006/07 from 5.5 percent in 1980/81-1984/85 period. Private sector investment in total agricultural investment reached to 75 percent in 2006/07, which was about 52 percent in 1980/81-1984/85. Due to private sector investment the total investment in agricultural GDP reached to 12.2 percent in 2006/07, which is highest during the last 25 years. But investment has to further increase to 16 percent of the agricultural GDP to achieve 4 percent growth targets (Government of India 2007).

Contrary to public investment in agriculture, subsidies are

²It is estimated that 10 percent decrease in public investments (including irrigation and power) leads to a 2.4 percent reduction in agricultural GDP growth (Gulati and Bathla 2002).

increasing exponentially. The subsidies are allocated to fertilizer, power, irrigation and other components (like seed and insurance). The estimates show that total subsidies in Indian agriculture have gone up significantly from Rs 15799 crore in 1993-94 to Rs 42743 crore; an increase of over 170 percent. In 2004/05, these subsidies were about 9.6 percent of the agricultural GDP, and about three times of the public investment in agriculture. In 1994/95, subsidies were about 5 percent of the agricultural GDP and about twice of public investment in agriculture. These subsidies need to be reduced and diverted for investment in agriculture to improve efficiencies. Unfortunately, the subsidies are causing more harm than benefiting agricultural system: (i) reducing opportunities for agricultural investment, (ii) deteriorating production environment as the subsidies are encouraging injudicious use of inputs and adversely affecting input use efficiency and production; and (iii) large part of subsidy is going to favorable areas and large farmers; underprivileged regions, farmers and crops are less benefited of these subsidies. A revisit on agricultural subsidies and rationalizing their allocation will benefit agriculture sector and boost investment opportunities.

c. Rising food prices

The unabated rise in the inflation of food commodities is one of the greatest challenges in Indian economy. The annual rate of inflation has almost touched 20 percent during the last one year. High economic growth accompanied by a very low overall inflation, on the one hand, and poor performance of food commodities with sustained high inflation on the other, have created a peculiar situation to tackle the prices of food and non-food commodities. Both demand and supply side factors are

responsible for continuous rise in the prices of food commodities. Obviously, excess demand situation has emerged due to growing gap between demand and supply of food commodities. Increasing population, rising income due to high economic growth, growing urbanization and unfolding globalization are responsible for pushing the demand for food commodities faster during recent times than before. The National Rural Employment Guarantee Scheme, the flagship program of government, has also raised income of poor and increased demand for food commodities in rural areas.

The rising demand for food commodities did not commensurate with the existing supply of food commodities. It appears that India is not prepared to meet the growing demand of essential commodities in an era of high economic growth. The available predictions reveal that the required growth of rice and wheat production during 2004-11 should be around 1.7% per annum to meet the growing demand for these commodities. Unfortunately, the production of these commodities was way behind the projected demand. Speculators and middlemen judged the excess demand before government take any decision, and managed their inventory to take advantage of the excess demand scenario. Rising prices of food commodities will adversely affect the purchasing power of the poor most. Some argue that rising prices would benefit farming community. Contrary to this, farmers, especially smallholders, would be worst affected as they are the net buyers of food commodities. Such a situation would lead to agrarian distress and increase number of people below poverty line.

d. Deteriorating natural resources

Agricultural production environment is affected due to deteriorating quality of natural resources. The problems are related

with the deteriorating quality of soil and water resources. These problems are observed in irrigated as well as rainfed areas. In this section, key problems related to soil and water resources are discussed.

Soil salinity and waterlogging: This problem is largely confined in canal irrigated areas. Mismanagement and extensive uses of canal water in many parts of the country are leading to the problem of soil salinity and waterlogging in about 12 million ha. The injudicious and mismanagement of canal water is a result of poor irrigation infrastructure and high subsidies on canal water rates. The loss due to soil salinity and waterlogging ranges from about 25 percent to complete abandoning crop production.

Soil erosion: The rainfed areas are confronted with the problem of soil erosion in about 130 million ha area. The problem increases cost of production and reduces crop productivity and farm profitability. The problem is more prone in marginal and fragile areas, where underprivileged farming community depends on their livelihood opportunities. The government of India through different ministries has invested more than US\$ 2 billion during the last 50 years until 1999-2000. The investment in watershed program has further got momentum through more people's participation.

Nutrient imbalance: Imbalance use of plant nutrients, largely due to skewed fertilizer subsidy, has led to deteriorate soil quality. To ensure sustained crop productivity, soil fertility has to be improved and maintained by application of balanced nutrients. In several high productivity regions such as Punjab, the NPK applied is 28:7:1 (2004/05), as against the recommended 4:2:1. As a consequence, soils in many regions have become deficit in

nutrients, particularly of micro and secondary nutrients, such as sulphur, zinc, boron, molybdenum, iron, manganese and copper. Often imbalance and increasing use of fertilizers negate the impact of improved varieties and other production practices. The increased inputs are only adding to the production cost, marginalizing net returns to the farmers, and creating environmental problems.

Falling water table: The water table in good quality water areas is steeply declining at a fast rate. Recent report by Brown (2007) revealed that in India, 21 million wells drilled are lowering water tables in most of the country. Excessive use of ground water is due to high subsidies in electricity (power); in some states use of power is free. Ground water is precious and must be conserved and judiciously used.

3. Opportunities before Indian Agriculture

New opportunities in Indian agriculture are emerging as the sector is transforming. These include (a) potential of improved technologies; (b) growing demand for food commodities, especially high-value commodities; (c) participation of organized retail in value chain; and (d) emerging export opportunities. The key challenge before policy makers is to unleash the emerging opportunities in favor of smallholders in areas which were bypassed during the green revolution period.

a. Potential of improved technology

A large number of improved technologies for different agro-ecoregions are available, which have high yield potential. The yields obtained by the farmers are too low against the potential of improved technologies. For example, at the national level the rice yield is around 2 t/ha and of wheat is around 2.6 and 2.7 t/ha. The

yield gap (improved and actual) is ranging between 170 percent in Chhattisgarh to 222 percent in Bihar and Uttar Pradesh. In wheat, it is as high as 105 percent in Bihar to 50 percent in Uttar Pradesh. For sugarcane, the yield gap ranges from 82 percent in Bihar to 148 percent in Maharashtra. The same is true for other commodities. Recent initiative of the government of India to increase foodgrain production by launching 'National Food Security Mission' is welcoming. An outlay of Rs 4882.5 crores was announced for the mission during the eleventh Five Year Plan. The proposed mission envisages to increase the production of rice, wheat and pulses by 10, 8 and 2 million tons, respectively by 2011/12. Bridging yield gaps would be the main plank to augment foodgrain production under the mission. Harnessing the potential of improved technologies will not only increase production but also substantially enhance income from agriculture. Access to high-yielding seeds, fertilizer and other key inputs, and delivery of information about improved technologies should be given higher priority, especially in low yielding states.

b. Growing demand for food commodities

There exists huge opportunity to augment agricultural production as the demand for all the food commodities is growing. The demand for foodgrains is expected to increase to about 297 million tons in 2025 from 211 million tons in 2004/05; an increase of about 18 percent. Contrary to this, the demand for high-value commodities is projected to increase faster than foodgrains; by about 40 percent for vegetables, 60 percent for fruits, 55 percent for milk and 88 percent for meat. The demand for foodgrains, especially of rice and wheat, is growing largely due to increase in population. But the demand for high value commodities (such as fruits,

vegetables, milk, meat, fish) is growing as a result of rising income, growing urbanization, unfolding globalization and changing taste and preferences, besides growth in population. The projections reveal that the food basket in India will continue to diversify with the rise in per capita income.

Indian farmers are responding to the growing demand for high-value commodities. The share of high-value commodities in the total value of agricultural commodities has increased from 32.5% in 1982/83 to 44.4% in 2002/03 (*Birthal et al 2007*), and expected to be more than 50 percent in 2008-09. There was a rapid decline in case of rice, coarse cereals, pulses and also oilseeds. During this period, share of fruits and vegetables in the gross value of agricultural output increased from 14 to 20%. The annual growth in production of high-value commodities was over 6 percent during 1992-93 and 2007/08, which was 4 percent during 1980/81 and 1990/91. In contrast, annual growth in production for foodgrains during these periods was 1.2 and 2.8 percent, respectively. Expansion in the share of high-value commodities (such as horticulture, livestock and fish) is largely because these suit the needs of smallholders (*Joshi et al 2006*). These commodities yield higher, quick and regular returns as compared to cereals and other commercial crops. This is what a smallholder needs and they are responding accordingly. Since these commodities are labor-intensive, and smallholder possesses more labor than large farmers, they may have comparative edge of producing these commodities. The constraints of high risk in production and marketing due their perishable nature may be offset by evolving appropriate institutional arrangements such as contract farming, farmers' associations and farmers' companies. A silent revolution

of such institutional innovations is apparent in India which is enhancing farmers' income and reducing the risk in production and marketing (*Birthal et al 2007*). To cite an example, farmers through contract farming transfer more than 80 percent risk to the industry in case of poultry, which is most vulnerable to risk in production and marketing.

c. Participation of organized retail of food commodities

The organized private sector is entering in agri-business, especially in post-harvest operations such as processing, value addition and marketing. Among others, rise of supermarkets and retail food chains is a unique example which is linking producers and consumers. These are revolutionizing the retail food trade. They account for 70-80 percent of sales in the United States, 50-60 percent in Latin America, a rapidly growing share in Southeast Asia, and a smaller, but growing, share in South Asia. In India, many organized retail chains have been established in food trade. These are becoming major markets for middle-income consumers. Their growth has proliferated in metro cities and gradually spreading in other high income urban areas. The food retail business in India is projected to grow from the present volume of \$189 billion to \$460-470 billion by 2010 (*The Economic Times 2003*). These retail food chains are also developing links with the farmers for supplying the raw materials in unprocessed and semi-processed forms. These supermarkets and retail food chains are providing information, technology, and credit to the farmers and procure the produce from their door-steps, thereby augmenting their income and reducing their risk and transaction costs (*Chengappa et al., 2007*).

The advantages of supermarkets and retail food chains are: (i) reduction in post-harvest losses and wastes, (ii) improvement in

marketing efficiency, (iii) minimization of wastages and overheads, (iv) assurance of food quality and food safety, and (v) provision of more employment opportunities to women for ensuring high quality standards through such operations as cleaning, physical grading, packaging, etc. In developing countries, consumers pay 3 to 4-times the farm-gate prices for the fresh produce. Almost 60-80 percent of price the consumers pay goes to commission agents and wholesalers to cover transportation, loading, unloading, storage, wastage, overheads, profits, etc. In an organized retail market, consumers pay only 1.5 to 2-times the farm-gate prices for basic food (Economic Times 2003). Integrating smallholders in the market chain, cutting marketing costs, reducing wastages, and enhancing consumers' satisfaction are the key factors for the success of retail food chains. As a result, the farmer can earn a higher price, and more profit.

To improve market efficiency, involve farmers in transfer part of profit of emerging opportunities (especially in high-value and processing segment), share the benefit with the consumers, there is a need to promote policies to attract private sector in agri-business.

d. Export opportunities

Indian agriculture is integrating with the global market and getting globalized by suitably designing trade policy. Agriculture trade is growing at an annual rate of 9.6 percent during 1992 and 2007³. These trends indicate that share of agricultural trade in agricultural GDP has consistently increased after the economic reforms initiated in early 1990s. The share of agricultural trade in

³Last two years were unusually uncertain for world agriculture, including India. Therefore, the results are discussed till 2007.

GDP which was 5.4 percent in 1992 went up to 9.7 percent in 2007. This is a clear indication that Indian agriculture is opening and integrating with the global market. Though the value of export is much higher than the imports, the imports are growing faster than exports during 1992 and 2007. The import of edible oil and pulses are the major component in the import basket. The share of edible oil and pulses in total import is about 70 percent. The Indian export basket is changing fast. The traditional export commodities such as tea, coffee, cashew nuts, etc are showing declining trends, while those of non-traditional export commodities such as rice (both basmati and non-basmati), oilmeals, fruits & vegetables, livestock products, spices, cotton, sugar and molasses and marine products are becoming the major items of agricultural export from India.

Promoting export of high-value and processed commodities and reducing import of edible oil and pulses should receive the policy and technology response. To promote export, more focus on quality aspects, especially SPS related issues, in high-value and processed commodities should be given in developing appropriate infrastructure and institutions and providing adequate information to the producers and export houses on meeting the quality standards. To reduce import of edible oil and pulses, role of improved production and processing technologies should be given due importance.

4. Way Ahead to Reap the Benefits

It is clear that there are challenges as well as opportunities in Indian agriculture. Future policies and strategies need to be evolved in such a way that overcome the challenges and harness the gains of the emerging opportunities. The challenge before the policy makers is to increase agricultural production, accelerate the speed

of transition towards commercialization, diversification and globalization, and involve smallholders effectively and genuinely in the process, sharing the benefits with them without compromising the quality of natural resources. This section provides some of the important steps that may accelerate the process of such transition.

a. Enhance investment in agriculture

Agricultural investment needs to be enhanced substantially to create infrastructure for effective transformation of Indian agriculture. The Steering Committee of the Eleventh Five Year Plan has clearly proposed that investment in agriculture has to be stepped up from existing 12 percent of the agricultural GDP to 16 percent to achieve 4 percent growth in agriculture. In current state of agriculture, new form of investment is needed in agriculture. This includes, for example, investment on developing warehouse facilities, cold storage, cold chains, terminal markets, ICT network for information dissemination, establishing weather stations for forecasting and insurance purposes. Rural roads, land and irrigation development, rail connectivity, etc needs massive public investment in partnership with the private sector. The recent initiative of the government on '*Rashtriya Krishi Vikas Yojana* (RKVY), is a welcoming program. The government of India allocated Rs 25,000 crore for the Eleventh Five year Plan under this program. The main purpose of the program was to provide incentives to the states to increase public investment in agriculture and allied sectors (Government of India 2008). Though the program is quite impressive to trigger investment by the states, its success is yet to be assessed.

b. Link farmers with emerging markets

The marketing efficiencies in Indian agriculture are too low compared to the developed countries. It is mainly due to number of intermediaries in the entire value chain, high transition costs, poor road network and transport arrangements. The smallholders with tiny marketed surplus further add up to the inefficiencies. Huge wastage is also one of the key problems among perishable commodities. For example, 25-30 percent of total production is lost during post-harvest. Therefore, vertical coordination has the potential to decrease transaction costs and increase economic efficiency, so that smallholders can seize the opportunities brought forth by the structural change in agriculture. The recent introduction of the Model Marketing Act, an amendment of the APMC Act, paved the way for linking framers directly with the agri-business and processing sector.

Three aspects are critical for involving smallholders in sharing the benefits of agricultural transformation: (i) strengthening farm-firm linkages through intermediate institutional structures such as cooperatives, contract farming and producers' associations, etc; (ii) developing the organized retail industry and coordinated supply chains in the form of supermarkets, ensuring smallholders' participation and enforcing food quality and standards to meet the requirements of global and domestic consumers; and (iii) strengthening the financial sector to ensure regular supply of credit to farmers, firms and retailers (*Joshi et al 2006*). All are happening but need special emphasis to attract private sector and evolve mechanisms that protect interest of farmers.

c. Agricultural insurance

Indian agriculture is prone to high risk and uncertainty. The most important eventualities that adversely affect agricultural production are droughts and floods. High and scanty rainfall and extreme variability in temperature have direct impact on crop yields. Since farm holdings are small, steep or even marginal decline in crop yields adversely affect the food and economic security of farming community. Recurrence of crop failure due to any eventuality often devastates farmers financially and leads to distress and in extreme cases to suicides. Therefore, crop insurance becomes an effective tool against different uncertainties causing crop failure.

In India, the share of agricultural insurance premium in total farm gate value is mere 0.015 percent. At global level, the corresponding figure is about 0.5 percent. The crop insurance in developed and developing countries largely depend on government support in the form of subsidy on premium, reimbursement of administrative expenses of insurance companies, reinsurance support for high-risk crops and financial support for technical guidance. For example, the subsidy on premium is about 70 percent in Canada, 60 percent in United States of America, 58 percent in Spain, and 50-60 percent in Philippines.

Crop insurance in India is at infancy stage. It was recently stated with the introduction of National Agricultural Insurance Scheme (NAIS) in 1999-2000 with the Agriculture Insurance Company of India. The scheme was subsidy-driven in 23 states and two Union Territories, but it is yet to reach to the majority of the farmers. The main reasons for its slow spread were unrealistic crop loss assessment due to inadequate infrastructure in the fields, and

long delay in payment of claims. Absence of adequate infrastructure to provide reliable information about fluctuation in weather parameters is limiting the success of various insurance models. More innovative agri-insurance need to be developed which are flexible, transparent, facile and farmer-friendly. A strong network of weather stations would be pre-requisite for successfully implementing the weather based insurance.

d. Special Agriculture Zone

There is a need for developing Special Agriculture Zones (SAZs) instead of the Special Economic Zones (SEZs), which have created heated political as well as socio-economic debate in the country, and led farmers' agitation and unrest in many parts. Developing SEZ is a recent policy change to make India an internationally competitive and hassle free environment for exports. Although the policy intends to develop the regions and promote export, it was questioned on issues related to welfare of those dependent on agriculture as large cultivated area is acquired for the purpose. Agriculture sector is already under crises, and there is a widespread unrest among farmers due to slowing down or stagnating incomes. The main reasons for the controversy of developing SEZs are (i) diverting fertile and irrigated cultivated areas for SEZs; (ii) paying low compensation to farmers; (iii) ignoring involvement of farmers in the activities of SEZ; and (iv) violating land ceiling laws for industrial houses in the guise of SEZ.

It is important to develop special economic zones for agricultural commodities (especially for crop, horticultural, livestock, fish and medicinal commodities) having agricultural technology malls with an institutional arrangement for farmers to share the benefits of such measures. The sequencing of developing

SEZs should be agriculture centric. In the beginning it should identify the niche areas for developing agriculture, value addition and processing; which should simultaneously provide vocational education and skill development program to the farmer so as to absorb them ultimately in the industrial and/or manufacturing sectors in the medium- and long-term. Some pilot projects should be started in partnership with the private sector by fully involving farmers in sharing benefits.

e. Promote non-farm opportunities

The small and marginal farmers with tiny owned lands in marginal and fragile areas are unviable. The farmers must be absorbed in the non-agriculture sector. Productive non-farm employment and income augmenting opportunities need to be created in the labor-abundant areas to absorb surplus farm labor to non-agriculture. The approach paper by the National Commission for Enterprises in the Unorganized Sector for a 'Special Programme for marginal and Small Framers' showed that the contribution of off-farm income to total income of farmers is usually inversely related to farm size. The report revealed that smallholders with insufficient income from farm with high man-land ratio force them to explore alternative income augmenting opportunities for their livelihood. It was noted that the marginal farmers (<1 ha) rely mainly on wages (54 percent) to supplement their income. Income from cultivation yields only 26 percent of the total income of marginal farmers. The general observation is that the share of wages, animal farming and non-farm business in total income of the farm household goes down with the increase in farm size while share of cultivation increases with the farm size. For marginal and small farmers, wage income and animal farming are the major

ingredients of their income and they have little access to non-farm job opportunities (Government of India 2008). Need-based skill development should be high priority for absorbing smallholders in non-farm sector.

5. Conclusions

It is clear that a huge potential exists for augmenting agricultural production and income by tapping the opportunities and overcoming the challenges. Increasing demand for food (both foodgrains and high-value commodities) is a great opportunity for Indian farmer. The rising incomes, growing urbanization and unfolding globalization are throwing complex challenges as well as enormous opportunities to agriculture sector. The segment of high-value agriculture comprising of fruits and vegetables, livestock (dairy and meat, including poultry) and fishery, is offering abundant opportunities to augment income, generate employment and conserve natural resources. Their advantage is that these commodities suit the needs of smallholders more than the large farmers. Promoting these commodities without compromising the food security would go a long way in empowering smallholders in areas which were by-passed during the green revolution period. Exploring low-performing high-potential areas and promoting those would augment supply of food commodities. Long awaited reforms in agricultural sector are due in key sectors, such as fertilizer, seed, irrigation and power, to alleviate supply side constraints and make farm sector more efficient and responsive. It is also time to review the centre and state relations in agriculture.

A multi-pronged strategy would be required to unleash the

opportunities and overcome the challenges. There is a need to delineate areas based on their potential for promoting foodgrains and high-value commodities for domestic and global markets. Appropriate production, marketing and processing arrangements may be initiated in the entire value chain to minimize losses and improve production and marketing efficiencies. Efforts towards food safety and quality must be ensured, especially for export and remunerative markets. The production environment must be consolidated by forming farmers' associations or cooperatives to take advantage of economies of scale and reduce the transaction costs. Heavy public investment and suitable institutional arrangement would be pre-condition for moving in a high growth trajectory path of Indian agriculture.

Dear awardees, as the globalization is unfolding, numerous opportunities will soon be welcoming you to step in. It is up to you, how you view the emerging opportunities, and harness their potential in favor of our nation, especially for the poorest of the poor. I would like to remind all of you, the words of the father of the Nation, Mahatma Gandhi that 'serving poor is serving God'. Through this profession, you have got an opportunity to serve the God. I urge all of you to become a change agent in our society. Be different from others. Do things differently than others. Move step-by-step; and I am sure that one day, and very soon you will be in the top of the ladder.

Dear friends, build your future reputation with your achievements. I wish all of you to spread the fragrance of your goodwill and contribution all around your environment. I would

like to quote Chanakya on this: **"The fragrance of flowers spreads only in the direction of wind, but the goodness and selfless service of a person spreads in all the directions"**.

I wish you good luck in all your future endeavor; and pray to the God to give you all the success in your life.

Thank you and Jai Bharat.

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