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Dr. Nazeerudin
Faculty Member, Center for Rural Development Studies, Bangalore University Karnataka, India

Dr. BM Rajani Kanth
Center for Rural Development Studies, Bangalore University Karnataka, India

Corresponding Author:
Dr. Nazeerudin
Faculty Member, Center for Rural Development Studies, Bangalore University Karnataka, India

India's agriculture: Issues and priorities

Dr. Nazeerudin and Dr. BM Rajani Kanth

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Abstract
Indian agriculture employs the largest share of the workforce – about 42 percent in 2019 – though its share in overall gross domestic product (GDP) is only 16.5 percent. India is still largely a rural economy with 66 percent of the country's population living in rural areas (World Bank, 2019) and agriculture continues to be the mainstay of a large segment of this section of the population. Agriculture is also important for consumers, as an average Indian household spends about 45 percent of its expenditure on food.1 Moreover, given that India is going to be the most populous country, surpassing China, by 2027 (according to United Nations population projections, 2019), it would be a major challenge for Indian agriculture to feed this large population especially in the wake of the emerging challenges of climate change and the degradation of natural resources such as air, water and land, etc. This challenge becomes more serious with the expected rise in per capita incomes2 as well as increasing urbanization – the urban population is estimated to be 600 million by 2030 – both of which are likely to increase the demand for food, feed and fiber. Moreover, not only will there be more mouths to feed, but, as per capita income grows, there will be much higher demand for high value agriculture products such as meat, fish, dairy, fruits and vegetables (OECD/FAO, 2019). This would be very much in line with Bennett's Law of food consumption, which states
The paper is organized as follows: Section 1 presents the backdrop of Indian agriculture within the context of the Indian economy
Section 2 critically examines the Challenges in agriculture sector raising agricultural productivity per unit of land: Reducing rural poverty. Ensuring that agricultural growth responds to food security needs
Section 3 mainly focuses on priority areas in agriculture which includes Promoting new technologies and reforming agricultural research and extension: Water Resources and Irrigation/Drainage Management Facilitating agricultural diversification to higher-value commodities. Poverty alleviation Sustaining the environment and future agricultural productivity Finally It also highlights the intervention of World Bank Support to achieve sustainable agricultural growth.

Keywords: Agriculture, productivity, poverty alleviation sustainable environment challenges

Introduction
While agriculture's share in India's economy has progressively declined to less than 15% due to the high growth rates of the industrial and services sectors, the sector's importance in India's economic and social fabric goes well beyond this indicator. First, nearly three-quarters of India's families depend on rural incomes. Second, the majority of India's poor (Some 770 million people or about 70 percent) are found in rural areas. And third, India's food security depends on producing cereal crops, as well as increasing its production of fruits, vegetables and milk to meet the demands of a growing population with rising incomes. To do so, a productive, competitive, diversified and sustainable agricultural sector will need to emerge at an accelerated pace.
India is a global agricultural powerhouse. It is the world's largest producer of milk, pulses, and spices, and has the world's largest cattle herd (Buffaloes), as well as the largest area under wheat, rice and cotton. It is the second largest producer of rice, wheat, cotton, sugarcane, farmed fish, sheep & goat meat, fruit, vegetables and tea. The country has some 195 m ha under cultivation of which some 63 percent are rainfed (Roughly 125m ha) while 37 percent are irrigated (70 m ha). In addition, forests cover some 65 m ha of India's land.

Methods and Materials
A descriptive and explorative methodology is followed. The secondary data based on various reports from Govt depts and other research institutions.

The published sources such as Web sites, periodicals and Reports are liberally used for the preparation of the paper.

Challenges

Three agriculture sector challenges will be important to India's overall development and the improved welfare of its rural poor:

1. **Raising agricultural productivity per unit of land** Raising productivity per unit of land will need to be the main engine of agricultural growth as virtually all cultivable land is farmed. Water resources are also limited and water for irrigation must contend with increasing industrial and urban needs. All measures to increase productivity will need exploiting, amongst them: increasing yields, diversification to higher value crops, and developing value chains to reduce marketing costs.
2. **Reducing rural poverty through a socially inclusive strategy that comprises both agriculture as well as non-farm employment:** Rural development must also benefit the poor, landless, women, scheduled castes and tribes. Moreover, there are strong regional disparities: the majority of India's poor are in rain-fed areas or in the Eastern Indo-Gangetic plains. Reaching such groups has not been easy. While progress has been made - the rural population classified as poor fell from nearly 40% in the early 1990s to below 30% by the mid-2000s (about a 1% fall per year) – there is a clear need for a faster reduction. Hence, poverty alleviation is a central pillar of the rural development efforts of the Government and the World Bank.
3. **Ensuring that agricultural growth responds to food security needs:** The sharp rise in food-grain production during India's Green Revolution of the 1970s enabled the country to achieve self-sufficiency in food-grains and stave off the threat of famine. Agricultural intensification in the 1970s to 1980s saw an increased demand for rural labor that raised rural wages and, together with declining food prices, reduced rural poverty. However agricultural growth in the 1990s and 2000s slowed down, averaging about 3.5% per annum, and cereal yields have increased by only 1.4% per annum in the 2000s. The slow-down in agricultural growth has become a major cause for concern. India's rice yields are one-third of China's and about half of those in Vietnam and Indonesia. The same is true for most other agricultural commodities.

Policy makers will thus need to initiate and/or conclude policy actions and public programs to shift the sector away from the existing policy and institutional regime that appears to be no longer viable and build a solid foundation for a much more productive, internationally competitive, and diversified agricultural sector.

Priority Areas for Support

Enhancing agricultural productivity, competitiveness, and rural growth

Promoting new technologies and reforming agricultural research and extension: Major reform and strengthening of India's agricultural research and extension systems is one of the most important needs for agricultural growth. These services have declined over time due to chronic underfunding of infrastructure and operations, no replacement of aging researchers or broad access to state-of-the-art technologies. Research now has little to provide beyond the time-worn packages of the past. Public extension services are struggling and offer little new knowledge to farmers. There is too little connection between research and extension, or between these services and the private sector.

Improving Water Resources and Irrigation/Drainage Management: Agriculture is India's largest user of water. However, increasing competition for water between industry, domestic use and agriculture has highlighted the need to plan and manage water on a river basin and multi-sectoral basis. As urban and other demands multiply, less water is likely to be available for irrigation. Ways to radically enhance the productivity of irrigation ("More crop per drop") need to be found. Piped conveyance, better on-farm management of water, and use of more efficient delivery mechanisms such as drip irrigation are among the actions that could be taken. There is also a need to manage as opposed to exploit the use of groundwater. Incentives to pump less water such as levying electricity charges or community monitoring of use have not yet succeeded beyond sporadic initiatives. Other key priorities include: (i) modernizing Irrigation and Drainage Departments to integrate the participation of farmers and other agencies in managing irrigation water; (ii) improving cost recovery; (iii) rationalizing public expenditures, with priority to completing schemes with the highest returns; and (iv) allocating sufficient resources for operations and maintenance for the sustainability of investments.

Facilitating agricultural diversification to higher-value commodities: Encouraging farmers to diversify to higher value commodities will be a significant factor for higher agricultural growth, particularly in rain-fed areas where poverty is high. Moreover, considerable potential exists for expanding agro-processing and building competitive value chains from producers to urban centers and export markets. While diversification initiatives should be left to farmers and entrepreneurs, the Government can, first and foremost, liberalize constraints to marketing, transport, export and processing. It can also play a small regulatory role, taking due care that this does not become an impediment.

Promoting high growth commodities: Some agricultural sub-sectors have particularly high potential for expansion, notably dairy. The livestock sector, primarily due to dairy, contributes over a quarter of agricultural GDP and is a source of income for 70% of India's rural families, mostly those who are poor and headed by women. Growth in milk production, at about 4% per annum, has been brisk, but future domestic demand is expected to grow by at least 5% per annum. Milk production is constrained, however, by the poor genetic quality of cows, inadequate nutrients, inaccessible veterinary care, and other factors. A targeted program to tackle these constraints could boost production and have good impact on poverty.

Developing markets, agricultural credit and public expenditures: India's legacy of extensive government involvement in agricultural marketing has created restrictions in internal and external trade, resulting in cumbersome and high-cost marketing and transport options for agricultural commodities. Even so, private sector investment in marketing, value chains and agro-processing is growing, but much slower than potential. While some restrictions are being lifted, considerably more needs to be done to enable diversification and minimize consumer

prices. Improving access to rural finance for farmers is another need as it remains difficult for farmers to get credit. Moreover, subsidies on power, fertilizers and irrigation have progressively come to dominate Government expenditures on the sector, and are now four times larger than investment expenditures, crowding out top priorities such as agricultural research and extension.

Poverty alleviation and community actions

While agricultural growth will, in itself, provide the base for increasing incomes, for the 170 million or so rural persons that are below the poverty line, additional measures are required to make this growth inclusive. For instance, a rural livelihoods program that empowers communities to become self-reliant has been found to be particularly effective and well-suited for scaling-up. This program promotes the formation of self-help groups, increases community savings, and promotes local initiatives to increase incomes and employment. By federating to become larger entities, these institutions of the poor gain the strength to negotiate better prices and market access for their products, and also gain the political power over local governments to provide them with better technical and social services. These self-help groups are particularly effective at reaching women and impoverished families.

Sustaining the environment and future agricultural productivity

In parts of India, the over-pumping of water for agricultural use is leading to falling groundwater levels. Conversely, water-logging is leading to the build-up of salts in the soils of some irrigated areas. In rain-fed areas on the other hand, where the majority of the rural population live, agricultural practices need adapting to reduce soil erosion and increase the absorption of rainfall. Overexploited and degrading forest land need mitigation measures. There are proven solutions to nearly all of these problems. The most comprehensive is through watershed management programs, where communities engage in land planning and adopt agricultural practices that protect soils, increase water absorption and raise productivity through higher yields and crop diversification. At issue, however, is how to scale up such initiatives to cover larger areas of the country. Climate change must also be considered. More extreme events – droughts, floods, erratic rains – are expected and would have greatest impact in rain-fed areas. The watershed program, allied with initiatives from agricultural research and extension, may be the most suited agricultural program for promoting new varieties of crops and improved farm practices. But other thrusts, such as the livelihoods program and development of off-farm employment may also be key.

World Bank Support

With some $5.5 billion in net commitments from both IDA and IBRD, and 24 ongoing projects, the World Bank's agriculture and rural development program in India is by far the Bank's largest such program worldwide in absolute dollar terms. This figure is even higher when investments in rural development such as rural roads, rural finance and human development are included. Nonetheless, this amount is relatively small when compared with the Government's - both central and state - funding of public programs in support of agriculture. Most of the Bank's agriculture and rural development assistance is geared towards state-level support, but some also takes place at the national level.

The Bank's Agricultural and Rural Development portfolio is clustered across three broad themes with each project, generally, showing a significant integration of these themes.

Agriculture, watershed and natural resources management

- Water & irrigated agriculture
- Rural livelihood development

Over the past five to ten years, the Bank has been supporting

R&D in Agricultural Technology through two national level projects with pan-India implementation (the National Agriculture Technology Project and the National Agriculture Innovation Project) coordinated by the Government of India's Indian Council for Agricultural Research (ICAR).

Dissemination of Agricultural Technology: New approaches towards the dissemination of agricultural technology such as the Agriculture Technology Management Agency (ATMA) model have contributed to diversification of agricultural production in Assam and Uttar Pradesh. This extension approach is now being scaled-up across India.

Better delivery of irrigation water: World Bank support for the better delivery of irrigation water ranges from projects covering large irrigation infrastructure to local tanks and ponds. Projects also support the strengthening of water institutions in several states (Andhra Pradesh, Karnataka, Maharashtra, Rajasthan, Tamil Nadu, Uttar Pradesh) improved groundwater management practices (For instance, in the upcoming Rajasthan Agriculture Competitiveness Project).

Sustainable agricultural practices through watershed and rainfed agriculture development (Karnataka, Himachal Pradesh, Uttarakhand), soil reclamation efforts (Uttar Pradesh) and, more recently, improved groundwater management practices (for instance, in the upcoming Rajasthan Agriculture Competitiveness Project).

Improved access to rural credit and greater gender involvement in rural economic activities through rural livelihood initiatives undertaken by a number of states (Andhra Pradesh, Bihar, Madhya Pradesh, Orissa, Rajasthan, Tamil Nadu) and soon to be scaled up by GOI with Bank support through a National Rural Livelihood Mission.

Agricultural insurance by advising GOI on how to improve the actuarial design and implementation of the insurance program (e.g. rating methodology and product design, index insurance, use of mobile and remote sensing technology to measure yields, etc.).

Improved farmer access to agriculture markets through policy reforms and investments under the Maharashtra Agricultural Competitiveness Project which aims to reform regulated wholesale markets and provide farmers with alternative market opportunities.

The land policy agenda through analytical work as well as non-lending technical assistance in support of GOI's National Land Records Modernization Program.

Better rural connectivity through IDA support to the Prime Minister's National Rural Roads Program (PMGSY), and by connecting rural poor and smallholder farmers through collective action to public services through Self-Help Groups (and SHG federations), Water User Associations and Farmer Producer Organizations. Recently the Bank's

Board of Executive Directors approved the National Rural Livelihood Mission, which supports SHG approaches through a pan-India approach.

Summing Up

Agriculture in India has witnessed an impressive growth trajectory, taking the country from a food deficit one during the 1960s to a marginally food surplus one

Notwithstanding the economic success, the sector today is at a crossroads with numerous opportunities as well as concerns. On the one hand, the sector has grown and diversified, while, on the other. In order to meet these emerging challenges and mold food and agricultural policies, it is important to focus on the priority areas to boost up the agricultural growth in an economically, environmentally and financially sustainable way.

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