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Agri-Environment for Inclusive Growth in India

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ABSTRACT

Agriculture plays a significant role in economic growth and development. As the provider of food, it is a cornerstone of human existence. As a furnisher of industrial raw materials, it is an essential contributor to economic activity in other sectors of the economy. Agriculture is a substantial user of natural resources, particularly land and water. Its activities significantly impact the availability of these resources and their quality. As an industry founded on biology, agriculture significantly impacts ecosystems and non-agricultural plants and animals, particularly in terms of biodiversity. As with most forms of human activity, agricultural activities can have negative environmental impacts (generate negative environmental externalities) manifested in soil degradation and erosion, air and water pollution, and biodiversity loss. However, in contrast to many other forms of economic activity, agriculture can also generate positive externalities as reflected in the creation and maintenance of attractive landscapes and contributing to managing water supplies and maintaining wildlife habitats.

Given the above context, this paper attempts to briefly review agriculture's contribution to economic growth and environmental quality. It explores the possible solutions to boost Agricultural inclusive growth through technological innovations and further argues for Sustainable Natural resources management and supply chains system. It highlights the importance of gender issues in agriculture and Financial inclusion. Finally concluded that technological interventions combined with appropriate institutional innovations to strengthen the farm delivery system and improve the distribution of growth benefits, where environmentally sustainable principles are being ensured. A descriptive methodology is followed.

Keywords: *Agriculture, Sustainable, Environmental, Economic growth, Inclusive.*

INTRODUCTION

Agriculture plays a significant role in economic growth and development. As the provider of food, it is a cornerstone of human existence. As a furnisher of industrial raw materials, it is an essential contributor to economic activity in other sectors of the economy. Agriculture is a substantial user of natural resources, particularly land and water. Its actions significantly impact the availability of these resources and their quality.

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As an industry founded on biology, agriculture significantly impacts ecosystems and non-agricultural plants and animals, particularly in terms of biodiversity. As with most forms of human activity, agricultural activities can have negative environmental impacts (generate negative environmental externalities) manifested in soil degradation and erosion, air and water pollution, and biodiversity loss. However, in contrast to many other forms of economic activity, agriculture can also generate positive externalities as reflected in the creation and maintenance of attractive landscapes and contributing to managing water supplies and maintaining wildlife habitats.

Agriculture's role in economic growth

Agriculture has played and continues to play a vital role in global economic development. Pre-industrial economies were characterized by a large share of the economically active population engaged in an agricultural sector with low labour productivity. The presence of surplus labour in agriculture was identified by Lewis (1955) as a pre-condition for growth in the rest of the economy. Lewis argued that the agricultural sector provides a source of labour (and capital) that can be redirected into other areas of the economy to fuel the expansion of output in those sectors. The exit of work from US agriculture to more productive non-agricultural uses in the period after the Second World War has, for example, been identified as a significant contributor to the high rate of economic growth experienced in the United States until the early 1970s (Denison, 1985). The critical role played by increased agricultural productivity in economic growth in Japan (Ōkawa & Rosovky, 1960 & 1973) and Europe (Johnson, 1997) has also been documented.

The Indian economy has been growing at an impressive rate of seven per cent per annum during the last decade, while the agricultural sector has maintained a growth rate just above three per cent during this period. This, coupled with the high dependence of the population on agriculture, resulted in the widening of rural-urban income disparity. It is, therefore, necessary that Indian agriculture must grow faster for inclusive economic growth. In order to accelerate and sustain agricultural development, the ecological foundations (land, water, genetic resources, etc.) should be strengthened, and higher investment both from public and private sources should be encouraged. Also, necessary reforms to ensure the participation of disadvantaged regions and groups in the growth process should be intensified. This brief discusses these issues and underscores the need for the ever-green revolution with the right mix of technological, institutional and policy options.

METHODS AND MATERIALS

A descriptive and explorative methodology is followed. The secondary data is based on various reports from Govt depts and other research institutions. The published sources such as Web sites, periodicals and Reports are liberally used to prepare the paper.

Agricultural growth

The current agricultural growth rate of more than three per cent is not disappointing, but this should be seen in terms of the economic viability of small farmers and the high incidence of rural poverty in some parts of the country. For example, small farmers occupy 60-80 per cent of the land in the eastern region, and the incidence of poverty ranges from 28 to 46 per cent in this region. Therefore, the agriculture sector must grow to increase farm income and reduce rural poverty. The experience of East Asian countries shows that higher growth can be realized in smallholder agriculture. Still, there should be a rapid transfer of people from agriculture to industrial or rural non-farm sector. In India, when employment elasticity is low in agriculture, the non-farm sector's growth becomes critical, which depends on agricultural development and rural infrastructure.

There are three major growth trends in Indian agriculture. The first trend relates to higher growth rates of coarse cereals, mainly maize,

oilseeds and cotton, in recent periods. The growth in maize and cotton is primarily technology driven. In oilseeds, area expansion, price incentives and better seed varieties were responsible for yield growth. The second major welcome trend is impressive agricultural growth in some states like Gujarat, where institutional reforms to expand irrigation and technology transfer were the major contributing factors (Shah et al., 2009). The third major trend has been the rapid growth of high-value commodities like fruits, vegetables, livestock and fisheries. Price incentives, mainly because of rising demand and strong market linkages, prompted farmers to diversify towards these commodities. This was accompanied by supply-side factors like improved seed availability and other planting material. The evidence indicates that these sectors will continue to grow faster and, therefore, will compete for an area with food grains. Thus, there is a need to raise the productivity of food grains to release the area for the high-value commodities, which will require better technologies and input delivery systems in newer regions like eastern India.

Table 1: Annual growth rates in agricultural GDP, 1999/2000 to 2008/09

Commodity groups	Growth rate (%)
All India	***3.23***
Cereals	1.65
Pulses	1.74
Oilseeds	4.63
Fruits and vegetables	2.77
Livestock	4.59
Fishery	4.30

Note: Growth rates are excluding the abnormal year of 2002-03

Innovation system

Since much of the hope for an increase in agricultural productivity is pinned on technological innovations, it is imperative to strengthen the innovation system. The first and foremost requirement for this is enhancing public investment in agricultural R&D. The annual growth in public investment has slowed down from close to 6 per cent in the 1990s to 3 per cent during the last decade. The investment intensity, i.e. public investment as a percentage of agricultural gross domestic product (AgGDP), is nearly 0.6 per cent for research and almost 0.2 per cent for an extension. This is far less not only in terms of the investment made by other countries, including China and Brazil but also much lower considering the capital increase- the intensity of R&D. Private investment though growing fast remains at the periphery in terms of its overall share (15 per cent) in the total investment. Biotechnology research, attracting more private investment, is concentrated in pharmaceuticals, and agri-biotech commands only 14 per cent of the total turnover. To attract private investment and foster partnership with the public sector, an institutional mechanism for cost and benefit sharing in intellectual property rights is evolving. In the new IPR mechanisms, benefits are shared with the innovator whilst protecting the rights of farmers and local communities. Although the institutional mechanism is in place, the actors are learning to use this regime to realize their objectives. The bottom line shall be determined by the cost-effectiveness and the credibility of the IPR mechanisms, and the capacity of the participating institutions (Pal et al., 2007).

Table 2: Trends in public investment in agricultural research, 2004-05 prices

Indicator	1991	2001	2009
Public investment (Rs crore)	1,597	2,472	3,376
Public investment as percentage of AgGDP	0.45	0.47	0.61
Investment per hectare of agricultural land	118	174	240

Note: Investment intensity data are triennium averages ending in the year indicated in the column.

Sustainable Natural resources Management

Sustainable use of natural resources, enhancement of ecosystem services like reduction in greenhouse gases, and building resilience to climate change are essential for sustainable agricultural growth. These sustainability issues are more severe in fragile and rain-fed regions and, therefore, significant for inclusive growth. Technological options promoting conservation and efficient use of natural resources and institutional reforms to improve incentives for adopting environment-friendly farm practices can contribute to sustainable production systems. Institutional reforms should also promote incentives for cooperative solutions for common property resources. These solutions should be based on collective learning and involve low transaction costs for their implementation. Management of irrigation water resources is a classic example, and institutional reforms directed to improve the efficiency of surface irrigation can reduce the pressure on groundwater resources and, therefore, promote conjunctive use of surface and groundwater. It is found that good governance, clarity of objectives, appropriate scale (size and scope), compliance with rules, and use of powers are also positively associated with the performance. The management expertise and adaptability to local conditions also affect the distribution of benefits, especially among the rural poor.

There is an increasing awareness about the ecosystem and environmental services and the vulnerability of Indian agriculture to climate change. Ecosystem services and farm income are adversely affected by erratic and extreme weather events, which are found to be of higher magnitude in semi-arid regions. These regions have become more vulnerable to climate change because of their greater exposure and sensitivity to climate change, especially temperature and rainfall, and the limited adaptive capacity of the farmers. The expected loss of productivity and income may be up to10 per cent (IPCC, 2007). Therefore, building the resilience of agriculture through appropriate technical and policy interventions, risk management, and information system should be accorded high priority.

Accelerating of agricultural value chains

Agricultural market reforms are directed to promote innovations for creating and distributing value along the supply chains. In the process, supply chains are getting shorter by the elimination of those intermediaries which do not add any value. Therefore, these innovations reduce the cost, link production with consumption and improve the overall efficiency. In the process, some of the inefficient chains and procedures are being replaced by better ones. For the viability of innovative business models, three things are essential: a) market information flows backward to the farmers, b) desirability of having farmers as partners in venture capital for increasing their share, and c) a good business model with adequate institutional and technological support. One crucial concern is serving smallholders who now occupy more than 40 per cent of agricultural lands. There are a few examples which suggest the possibility of inclusion of smallholders. A viable business model should meet the requirements of amenable to scaling up, financial sustainability and better economic efficiency.

Gender issues in agriculture

Mainstreaming gender issues in agriculture development is essential for inclusive growth

as it affects a large section of the rural population. On efficiency grounds also, any exclusion of rural women will adversely affect child health and education, which in turn have far-reaching effects on labour productivity and economic growth. The options often discussed for social and economic empowerment of women are: increasing women's access and control over productive assets like land; entrepreneurship and skill development; education; and legal provisions for their representation in development programs. Efforts are being made on these lines, but the progress is rather mixed. The Hindu Succession Act (2005), giving property rights to daughters, has been implemented with great variability from state to state, and social traditions still have more say in the rights and control of land. Even the tradition of a daughter's right to parental property in southern India has also become weak. Therefore, skill development, education and participation in welfare programs could be more effective for the empowerment of rural women.

Financial inclusion

Financial exclusion, defined as the inability to access necessary financial services in time at affordable cost, is a major impediment to inclusive growth. Although the share of marginal and small farmers in the total credit is higher than their share in land area, but this is declining, and the institutions like Regional Rural Banks are also neglecting the rural poor. More than 51 per cent of farm households are excluded from both institutional and informal sources of credit, while 73 per cent of farm households do not have access to institutional credit. The exclusion incidence is higher in the central, eastern and north-eastern regions, where 64 per cent of the farm households are financially excluded. Credit needs for medical and social purposes, slowdown of agricultural growth, institutional norms and procedures, and weak financial positions of some institutions have contributed to the financial exclusion. Recent innovations like Kisan Credit Cards, Joint-liability Groups and Self-help Groups have made some difference, but innovations in the delivery system are essential for the financial inclusion of farmers and rural poor.

Summing Up

Agriculture, being the primary activity, particularly for a largely populated country like India, remains the most important part of the economy, directly impacting people's livelihood. Therefore, finding out environmentally sustainable solutions requires a detailed understanding regarding space and people located in major parts of the country.

Acceleration of agricultural growth is necessary to reduce rural-urban income disparity,enable the growth of non-farm sector for income diversification, control inflation and alleviate rural poverty. Concerted efforts in this direction should entail technological interventions combined with appropriate institutional innovations to strengthen the farm delivery system and improve the distribution of growth benefits. These innovations should specificallyaddress the issues of aggregation of production by a large number of smallholders, improvement of the delivery of inputs, credit and technology, and marketing efficiency. The importance of these factors has been demonstrated by the states like Gujarat showing high agricultural growth. The issue of human capital development is also important to grapple withthe increasing sophistication of technologies, farm practices, marketing and processing.

CONCLUSION

It is concluded that the improving environmental awareness, availability of publicly funded agricultural extension services and sharing of agricultural information with farmers may influence individual farmers' decision to adopt agricultural best management practices to protect the agri-environment. Linking the agricultural produces procurement policy of the government with the green Certification of agriculture may encourage farmers to adopt sustainable agricultural practices. There is a need for a holistic approach to the problem, and all issues from production till consumption involving all stakeholders need to be dealt

with simultaneously and not one after the other. We should also realize that a very vast agro-ecological diversity characterizes Indian agriculture in terms of natural endowments, rainfall, landforms, soils, climate, biodiversity, socio-economic levels of farming communities, etc, and therefore, the Integration of agricultural policies with the environment, water and land use policies could be the first step which ensures Agri Environmental Sustainability in particular and Inclusive Growth in General.

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