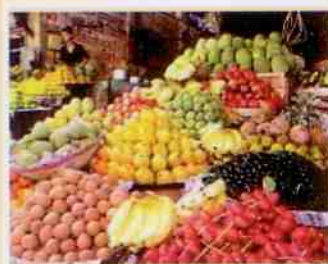




10th STATISTICS DAY



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**THEME: AGRICULTURE AND
FARMERS' WELFARE**

GOVERNMENT OF INDIA
MINISTRY OF STATISTICS AND PROGRAMME IMPLEMENTATION
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AGRICULTURE AND FARMERS' WELFARE IN INDIA: ROLE OF STATISTICS

Food and Agriculture Organisation of the United Nations

1. Introduction

About half of the Indian population earn their livelihood directly and indirectly from agriculture. It also supports the largest proportion of population who are poor (measured by any methods) in absolute and relative terms. This high level of dependency on agriculture clearly implies that if we want to achieve development goals as outlined in the Sustainable Development Goals (SDGs, 2015-2030), we need to bring transformation in the agricultural sector. This realization is reflected in Prime Minister's vision of achieving the target of doubling the income of the farmers by 2022.¹

In the above backdrop, this paper attempts to understand the major features and challenges of Indian agriculture and the role and contribution of statistical systems in enhancing farmer welfare through agricultural development.

2. Indian Agriculture: Features and Challenges

While the contribution of agriculture to GDP fell from 28.3 % in 1993-94 to 13.9 % in 2013-14, it continues to support half of the work force in the country (the employment share declined

¹ The details of this announcement and an analysis of the possibilities of achieving this can be found in Chandrasekhar, S., Mehrotra, N (2016). Available at <http://www.livemint.com/Politics/ibdSw1oYBh27Towb1X3qjN/Govt-sets-up-panel-to-lay-out-plan-for-doubling-farm-incomes.html> http://www.epw.in/system/files/pdf/2016_51/18/Doubling_Farmers%27_Incomes_by_2022_0.pdf

from 64.85% during 1993-94 to 48.9 % in 2011-12) (NITI Aayog, 2015; GOI and OUP 2014). Even more importantly, the poorest of the poor are still dependent on agriculture for their livelihoods. To improve the livelihoods of this large proportion of population and transform their lives by achieving the SDGs is a challenging task. The strategies for that have to focus undoubtedly on bringing transformation to the agricultural sector.

Some of the major issues in Indian agriculture that emerges out of several studies covering different regions and time periods are discussed below. These observations are supported and monitored by data and information provided by a well-established and competent statistical system evolved over the last seven decades based on robust scientific principles and time tested protocols. The six major features of Indian agriculture which is widely discussed in literature are briefly presented below.

2.1 Small size of holdings

Small holders (less than 2.0 hectares) constitute 83% of total landholdings and cultivate 42% of operated land (Chand, R., Prasanna, P.A.L., Aruna, S, 2011). This acts as a major constraint in availing the benefits of economies of scale in access to and utilization of major inputs (land, labour, human and machine, irrigation, fertilizer, credit, technology) and realizing remunerative prices from markets for their produce (Harriss-

White (2004) ; Agarwal, B (2011)). Hence, though their performance with respect to production parameters are superior, small size of land holding prevents them from realizing enough returns to move out from the vicious circle of poverty to prosperity (Chand.*et.al*, 2011; Hazell., 2011). The outcome of this differential access is evident from the fact that consumption expenditure of marginal and small farmers exceeds their estimated income by a significant margin, and they seem to cover the deficits by borrowing or other means (NCEUS, 2008). This further exacerbates their situation as poor households and in the aggregate level results in higher levels of incidence of poverty when compared to medium and large farmers. (*ibid.*, 2008).

2.2 Low productivity levels

Even with considerable investments in technology generation, transfer of technology and various forms of input and output support programmes and policies, the productivity levels in majority of important crops remain very low compared with Global productivity levels. In the case of major cereals like wheat and rice, India's yield levels are lower by 46 % and 39 % respectively when compared to China (GOI, 2016). Although the nature and extent of various constraints vary, India needs to focus its efforts in bridging yield gaps.

2.3 Shrinking land and water resource base

Fueled by rapid industrialization, urbanization and climate change, the resource base critical for agricultural production (primarily land and water available for cultivation) is shrinking at an alarming

rate (GOI, 2016). When compared with China and Brazil, India uses two to four times more water to produce one unit of major food crop (Chapagain, A. K., Hoekstra, A. Y, 2008). This clearly will have serious implications in the sustainability and production potential of agricultural systems eroding the foundations of food and nutritional security. (FAO and Earthscan, 2011).

2.4 Climate Change and Associated Risk and Vulnerability

Studies have shown that changing climate (inadequate and unequal distribution of rainfall, rise and fluctuations in temperature, raising sea levels, increase in the frequency of natural calamities etc.) has adverse effects on the agricultural production systems threatening food and nutritional security of vulnerable communities, particularly the small holders (Swaminathan, M.S., Rengalakshmi, R, 2016). Rural communities in affected areas are vulnerable to the risk of increased crop failure, loss of livestock, depletion of marine and aquaculture resources and forests (Dev, M.S., 2012). Though the nature and extent of impact may vary with regions and communities, farming community, particularly small holders are the ones who are more vulnerable and risk prone.

2.5 Segmentation of agricultural markets

The levels of segmentation of agriculture markets for output erode the benefits through competition, efficient resource allocation, specialization in subsectors and fewer intermediaries. This creates wide gaps in farm gate and wholesale prices and between wholesale and retail prices resulting in welfare losses for producers as well as consumers

(GOI, 2016).

2.6 Changes in dietary patterns

Studies examining patterns and trends in dietary composition of various groups of population over time has shown that there has been a diversification of Indian diets away from cereals to high value products like milk and meat products, vegetables and fruits- essentially, a shift from carbohydrate dominated to protein dominated diet (Pingali, P. 2006; Dev, 2012; Gaiha, R., Kaicker, N., Imai, K., Kulkarni, S.V., Thapa, G, 2013). This shift in the dietary composition offers huge potential for smallholders who contribute significantly towards diversification to high value crops to increase their returns from cultivation (Dev, 2012; BIRTHAL, P.S., JOSHI, P K, Narayanan, A.V, 2011).

3. Evolution of Indian Agricultural Statistics Systems

The Indian Statistical System has contributed to the progress and development of agriculture sector in a very significant way. These contributions are synonymous with the achievement of Prof. P. C. Mahalanobis whose visionary leadership made possible the establishment of a sound and scientifically designed statistical system to make remarkable contributions to the progress of the nation.

Soon after independence, the National Income Committee formed under Chairmanship of Prof. Mahalanobis, recognised the need for setting up institutions to meet the needs of information for planning (GOI, 1951). The formation of national agencies, such as the National Sample Survey (NSS) in 1950 and the Central Statistical Organisation

(CSO) in 1951 were feathers in the cap of Indian Statistical System.² The second Five Year Plan (1956-61) model prepared by P. C. Mahalanobis, based on statistical model, gave equal importance to consumer goods and producer goods industry, with an emphasis on village and cottage industries as well as increasing the supply of fertilizers, pesticides, machinery and equipment for agriculture (Mahalanobis, 1961).

The National Sample Survey which later evolved as the National Sample Survey Organisation (NSSO), in 1972, was the brainchild of P. C. Mahalanobis. It pioneered in conducting sample surveys covering various social and economic facets of life through nation-wide surveys. The first round of survey which took place from October 1950 to March 1951, provided data on socio-economic characteristics of households under separate categories, i.e., general household particulars; agriculture and livestock, households industry, craft and trade; services and financial operations; and household consumer expenditure. (GOI, 2004). Altogether NSSO have published results on seventy one rounds on various socio-economic issues of importance to development. The Directorate

² During the pre-independent period major efforts were carried out under the leadership of Prof. P.C. Mahalanobis on comparing agricultural data collected by long established mode of survey through plot-to-plot complete enumeration which was thought to give better results than sample surveys. One of the first experimentations in sample surveys was done for assessing area and yield of jute crop in Bengal in 1935. Subsequently during the Bengal famine of 1943, a sample survey of rice crop was started and compared with results of plot-to-plot enumeration simultaneously carried out by the Government Department in Bengal. The sample survey bore accurate results at costs less than one-tenth of that of plot-to-plot enumeration. Gradually statistical systems throughout the world came to embrace sample survey with grace.

of Economics and Statistics under Ministry of Agriculture has contributed significantly in providing forecasts and estimates of crop acreages and yields. A comprehensive scheme for the study of principal crops in India under Commission for Agricultural Costs and Prices collects detailed data on costs and returns realised by cultivators across 16 states covering wide range of crops (GOI, 2000). The data on costs and prices collected under this scheme continues to provide estimates of costs and returns from farming which form the basis of various price support mechanisms (Minimum Support Price and Procurement Price) to ensure the welfare of farming community while achieving the goals of food security. Data related to wages received by and paid by various categories of working class helps in construction of various indices to monitor living conditions of vulnerable sections and to take appropriate policy decisions and State interventions.

4. Indian Statistical systems in Modern Times: Challenges and Opportunities

In recent times, with the changing global order and economic systems of the world, where complexities of social systems have increased, statistical systems are facing increasing challenges and demands that is put upon it is coming from diverse sources and with increased frequency. First and foremost, India needs to focus on the features and challenges of agriculture production systems in a way that contributes directly towards improving the overall wellbeing of the farmers. In a country of diverse population, multiple social and linguistic identities as well as ecological diversities, enormous amount of accurate

data and information collected and interpreted scientifically is required to understand the social and economic changes encompassing issues ranging from poverty and inequality, agriculture, food, health, education, industry, manufacturing and social mobility to formulate appropriate policies and strategies for intervention. Policies and strategies supported by relevant high quality and scientific data alone can bring transformations in agriculture and in essence the livelihood of the bottom of the pyramid population. The major areas where statistical systems can contribute to bring the transformation in agricultural sector and in improving farmer's livelihood systems are briefly as under.

4.1 Better Forecasting:

Timely and accurate forecasting of weather and climatic parameters facilitates formulation of better adaptation strategies and support the farmers in their decision making process with respect to agricultural production. It can even save lives and livelihoods of millions of population living in areas which are ecologically fragile and vulnerable to natural calamities. In this light, India's forecasting capabilities need to cater to the wide range of agro-ecologies in which agricultural production happens with different levels and capabilities.

4.2 Methodologies to Assess Risk and Vulnerabilities to Climate Change:

Addressing the challenges raised by climate variability emerges as the most critical element in ensuring sustainable agricultural production systems to ensure food and nutritional security of

vulnerable population through better adaptation strategies. This demands highly competent and sophisticated risk and vulnerability assessment and strategies for adaptation. A synergy of existing statistical systems in various sectors along with competent analytical capabilities, complemented by collection of data on some specific climate change related factors, by and large, should be able to effectively address the challenges posed by climate change.

4.3 Tracking Price Trends and Volatility:

A dashboard of information generated by tracking spatial and temporal movements in prices and commodities in different markets in the country can educate farmers about their prospects in realising better returns while ensuring competition and fairtrade. The National Statistical System should be proactive in achieving these capabilities and provide useful information on timely basis which can improve decision regarding cropping pattern, marketing strategies, post-harvest handling and value addition strategies.

4.4 Export Import Scenarios:

In a globalised economy, comparative advantage plays a major role (subject to policy framework) in determining movement of commodities across geographies. Availability and access to reliable data, information, and the knowledge generated by analysing those helps evidence based decision and policy making process related to exports and imports. This facilitates reduction in inefficiencies and distortions through suitable export import policies and tariff regimes. The ultimate beneficiary will be the farming community who

can avail opportunities to reap benefits of their comparative advantages, secure their food and nutritional security and at the same time protect themselves against price volatility and instability in international markets.

4.5 Measuring Welfare and Monitoring Impact

Assessing the impact of various development interventions is crucial to get the best out of scarce resources and competing demands. The surveys conducted by NSSO through several rounds covers a wide range of welfare indicators across diverse geographies and population. A meaningful combination of the results when put against relevant questions can facilitate formulation of suitable policies and appropriate interventions to bring out the poor and marginalised in the countryside, including farmers.

5. Global Perspective on Statistics in Agriculture

In a globalized world where barriers for flow and exchange of commodities and information are vanishing, and where nations are addressing the challenge of achieving growth with equity, our statistical systems should be well equipped to capture these complexities and its distributional patterns and welfare implications.

To achieve the SDGs, we need to focus our efforts on the most deprived and vulnerable population spread across various geographies, agro-ecologies, cultural and socio-economic landscapes. The basic requirement and necessary condition for such an act is a robust, scientific and high-

quality statistical information that can support analysis and informed policy decision making. This undoubtedly points to the importance of a global perspective of statistics on agriculture. The pace of agricultural growth has direct implication on the pace of eliminating poverty and hunger and ultimately achievements of our development goals. A statistical database on global agriculture, which is of high quality and having high standards of comparability that can capture the specificities and diversities of varied and complex agricultural production systems across the world can equip us with robust analysis and informed policy decisions in support of sustainable development. In the backdrop of a looming threat of climate change that can impact lives and livelihoods of millions of vulnerable population, a sustainable global statistical capacity to produce reliable and timely statistics and indicators measuring a country's progress, particularly of agricultural sector is a necessary condition to make planet earth a better place to live. This can facilitate reliable forecasting of weather and climatic events; better targeting and priority setting of our developmental interventions, equitable distribution of scarce resources, and technology transfer, to achieve the goals of eliminating poverty and hunger and achieve food and nutritional security. There can't be a better expression of this philosophy than the motto of the World Statistics Day, "Better Data. Better Lives"

6. Conclusion

In India, agriculture provides livelihoods to more than half of the country's population. Majority of the holdings are small (< 2ha). This results in lower

levels of returns from cultivation and incidence of higher levels of poverty among small holders when compared to large cultivators. Hence, to improve the welfare of bottom of the pyramid population of the country we need to bring transformation in the agricultural sector.

As a science, in India, Statistics has contributed to the process of nation building in the formative years and later through massive efforts on data collection, estimation and analysis by national institutions. The availability of statistical data related to crop area, yield levels, input usage, cost of cultivation, income levels, consumption levels, food and nutritional security and all other facets of socio-economic life of farming community indicates impressive achievements of the Indian Statistical System.

It goes without saying that in an ever changing world, statistical systems are subjected to various challenges and demands. The National Statistical Systems should live up to these challenges by preserving achievements of the past and providing direction to policy making efforts to face new challenges and address the question of farmers' well being more effectively and comprehensively. It should take up the challenge of times by providing information and knowledge through better forecasting, developing methodologies to assess risk and vulnerabilities to climate change, effective and timely tracking of price trends and volatility, analyzing export-import scenarios for better decision making and measure welfare changes for better impact. An increased focus on the quality of data collected, using available data through more rigorous analytics, closer link between the

policy makers and 'number crunchers' not only at the central but also in state and lower levels, and above all further development of a decision making system that relies more on objective set of information that also addresses the longer term sustainability issues, in particular, of natural resources India has at its disposal, would go a long way in enhancing the contribution of statistics to agricultural development. Indian Statistical System has responded adequately to the challenges that it faced in the past and those of us who benefit from this system are confident that it will effectively face the challenges that are emerging and will emerge in the future.

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