



SYSTEMS APPROACH IN AGRICULTURE

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ABSTRACT

In order to ensure a sustainable and inclusive growth of the Indian economy, a systems approach has to be adopted by our policy makers. The present study was undertaken with a focus towards the agricultural sector. Considering the billions to be fed, one must begin from the grass roots by first ensuring food security. While rapid advancements in science and technology are made in diverse domains, India plays a key role in shaping the world politics. The present study was taken up to assess the efforts made by the government, to identify the work that remains to be done in order to ensure a proper implementation of the formulated policies pertaining to agrarian economy. The study was exploratory in nature. The purpose of the study was twofold. One, it highlights the areas of improvements between policy formulation and policy implementation. Secondly, it also gives value able inputs to businesses to identify opportunities from the components of the supply chain and reap the benefits of new project ideas.

KEYWORDS: sustainable, agriculture, government, business, economy, implementation

INTRODUCTION

India is a critical juncture. At one end it is recognized as a key player in shaping the policies of the South –East Asia and the world to a great extent. Back home, rapid advancements are made in the field of space exploration, telecommunication, medicine and infrastructure, to name a few

.while the present government's innate mandate is to remove corruption and bring about a sustainable and inclusive growth, it has also paid considerable attention to ameliorate the condition of the rural populace which constitutes a major chunk of our population. Their contribution is of vital importance as it fulfills a basic need. Hence their wellbeing is of paramount importance if we strive to continue with the present pace of growth in the coming years.

Hence the need of the hour is to identify lapses in the implementation stages of the different policies and set up structures for management scrutiny. It also underlines a need to fix centers accountability. The whole set up requires transparency in its operations in order to eliminate unlawful elements from the business cycle.

REVIEW OF LITERATURE

A systems' approach encompasses a holistic view of the entire domain of study including all its constituent components. The prime component of the rural economy is the farmer. The present study was carried out by analyzing the inputs and the outputs in terms of a block diagram as follows:

The plan of action should begin from the source, i. e. the farmer. The inputs that he receives are of immense importance in determining the nature of his outputs .By means of a simple block diagram we may represent the entity of a farmer as follows:



The inputs that go into farming are made up by the quality of seeds, land fertility (or soil characteristics) water availability, fertilizer and pesticide usage etc. Institutions of the government have been set up to ensure premium quality seeds[1] .Farmers can approach these **seed testing** laboratories and obtain good quality seeds.

Soil testing service in India began in 1955-56 with the soil testing laboratory at IARI as the hub to coordinate with all the other soil testing laboratories in the country. The laboratory, known as

Central Laboratory for Soil and Plant Analysis, is well known among research and extension agencies, and farmers for its advanced facilities, reliability of analysis, and an efficient advisory service. [3]

It is to be noted that the above mentioned labs were also providing advice to the farmers to add suitable supplements in the form of manures and fertilizer to enhance the productivity of their land holdings. In a statement issued by the Agriculture Ministry, additional soil testing labs were being established. This would increase the annual analyzing capacity of state laboratories from 1.78 crore to 2.14 crore[2]. In addition, the government announced Soil Health Card scheme in 2014-15 to provide cards to 14 crore farmers once in a cycle of two years, on a continuous basis. Under this scheme, comprehensive testing of soil samples for 12 parameters including macro and micro nutrients would be carried out. In order to ensure proper implementation of the above plan, all the district collectors in all states have been asked to implement the latest guidelines for establishment of soil testing projects at village level under Soil Health Management (SHM) Scheme of National Mission for Sustainable Agriculture (NMSA).

The setting up of this framework and the mechanism to ensure proper implementation of the formulated objectives are absolutely essential to achieve the desired outcomes. This is what we infer from the case of the Soil Testing Services.

The next point was to ensure **availability of water** and its **proper drainage**. The Eleventh Plan had proposed a PPP in the irrigation and drainage sector in India. According to a report by ADB, At present, 78% of the water in India is being utilized for crops, and this is likely to reduce to 72% in 2025, and 65–68% in 2050, mainly due to competing demands in the domestic and industrial sectors. The net sown area being nearly exhausted, meeting the challenge of food security lies in increasing the food productivity and adopting efficient methods of irrigation. The challenge to be met is to increase the food grain production from the present 216 million tons to 380 million tons by 2050. The central government initiative of 1996–1997 to complete last mile projects under the AIBP received a boost under the Bharat Nirman flagship in 2005, which proposed to create irrigation potential of 2.5 mha during the Tenth Plan Period and 9 mha during the Eleventh Plan Period.[4]

It is to be noted that the Planning commission has classified the irrigation in India in three types on the basis of CCA (CCA stands for Cultural Command Area).It is the basis for the design of water course and an irrigation project. It is the proportion of the Gross Command Area which is culturable and cultivable.The three types were Major, Medium and Minor Irrigation Schemes

Major and Medium Irrigation (MMI) Projects

For the country as a whole, 66% of the total irrigation potential of major and medium projects has been created. The rate of creation of new irrigation potential through Major and Medium projects has increased in the recent past due to fruition of projects started much earlier, which have been expedited due to increased support through AIBP (Accelerated Irrigation Benefits Programme) launched in 1996-97.

Minor Irrigation Schemes

There is significant amount of variation in creation of irrigation potential through minor irrigation (both surface and ground water) schemes from State to State. While full potential through minor irrigation has been tapped in some of the States, it is comparatively low in the others. In a report, the National Commission for Integrated Water Resources Development points out that the carrying capacity of tanks has decreased over time for a variety of reasons and that the restoration and renovation of tanks and other local sources is a priority task as a result of a pilot scheme since 2004-05 taken up by the Government.

The government has spent a whopping sum of approximately \$776 billion over 60 years after independence to create an irrigation potential of about 42.35 mha. This outlay was divided between the major, medium and minor irrigation works . However, a gap does exist between the created and utilized irrigation potential. Hence proper implementation of these policies need to be entrusted to the states and district level officials and a routine reporting of the progress would ensure the desired results.

Pesticides play an important role in sustaining agricultural production. It also helps in controlling vectors responsible for diseases among the crops. However, on the flip side, they can be toxic, causing harm to both farmers and farm animals. Regarding the pesticide usage,

Pesticide Management Bill, 2008 was proposed. It replaced the Insecticides Act, 1968. The highlights of the Bill were as follows:

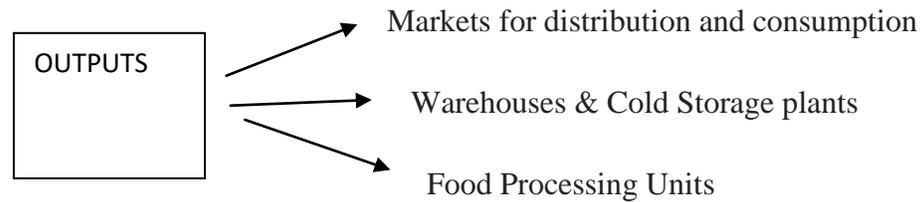
- The Bill has established a Central Pesticides Board to advise the government on matters related to pesticide regulation, manufacture, use and disposal. It establishes a registration committee to register pesticides.
- The Bill established a procedure to license manufacturers, distributors and retailers of pesticides, to be administered by state governments. It required Pesticide inspectors to inspect facilities and collect pesticide samples while pesticide analysts test the samples collected.
- It was found that the Bill did not specify penalties for pesticide inspectors or analysts who misused their powers. A Standing Committee thereafter, recommended that penalties be imposed on such government officers along the lines of similar provisions in the Drugs and Cosmetics Act, 1940 or the Food Safety and Standards Act, 2006. [6]

The Pesticide Management Bill 2017 was proposed. The modalities of the bill being worked upon, sought the intervention of the NITI Ayog. It was found that there were a number of accidental deaths due to unsafe use of pesticides. [7]

The Bill proposes to address the gamut of all aspects of development, regulation and quality monitoring, production, management, packaging, labelling, distribution, handling, application, use and control, including post-registration activities and disposal of all types of pesticides. The Bill proposes stringent punishments to check production and sale of misbranded, sub-standard and spurious pesticides, besides, and most importantly, providing for the disposal of expired, sub-standard and spurious pesticides in an environment friendly and safe manner. [8]

According to a report in TOI, Feb 24, 2018, farmers groups and safe food activists have raised a number of concerns, viz., the bill does not focus on reducing pesticide usage, does not talk about rigorous bio-safety testing and periodic review of health and environmental impacts of pesticides. It does not have a mechanism to trace retailers or brands manufacturing and marketing toxic or spurious pesticides.

Hence , we may conclude that concerted efforts have been made regarding most of the inputs. However much remains to be done. Good quality inputs may logically ensure a good quality output in terms of a good harvest. What we foresee for our farmers is a good quality of life where his basic needs of social and economic security are not compromised. Such a state is only possible when he is assured of good money for his produce. The inputs being adequate, good crop yield may be expected and this in turn should bring prosperity in the village.



Having examined the inputs, it becomes essential to now examine the outputs at the farmer's end. These may include a proper pricing mechanism, delivery mechanism of the harvested crops to the storage plants, food processing plants or to the markets for further distribution and consumption. It is noted that farmers had to often go in for distress sales as there is a negative correlation between productivity and price. Hence the requirement was to move from price volatility to price stabilization.

In order to ensure price transparency and the farmers get good and competitive prices for their products, the government has launched e-NAM. The National Agriculture Market, is an electronic trading portal across India launched by Ministry of Agriculture & Farmers' Welfare, Govt of India, to facilitate farmers, traders, buyers, exporters and processors with a common platform for trading commodities.[9] Their physical presence and dependence on intermediaries will not be required. The consumers would benefit by price stability and availability of products.

In Feb, 2018, the Union ministry of Agriculture and Farmer's welfare have launched six new features to the e-NAM. At present, 470 mandis across 14 states are live and 90 commodities are being traded on e-NAM platform, which was launched in April 2016. The target is to connect 585 mandis with e-NAM by March 2018. The e-NAM model aims at revolutionizing agricultural markets by moving towards 'One Nation, One Market'[10].

India is the largest producer of fruits and second largest producer of vegetables in the world. Both these products are perishable in nature and have a limited shelf life. However due to lack of cold chain facilities, about 25-30% of the produce is lost and farmers are often forced to go in for distress sale. There are two drawbacks in such situations. One, the farmer does not get returns and secondly, majority of the population does not access to these fruits and vegetables which are an essential components of a balanced diet. [11]

At present, a mere 2.2 per cent of fruits and vegetables are processed, even as the country ranks second in the world in terms of production. These data reflect a miniscule percentage in comparison to countries like Brazil (30 %), USA (70 %) and Malaysia (82 %).The National policy aims to increase the percentage of food being processed in the country to 10 per cent by 2010 and 25 per cent by 2025.

The ministry of food processing industries (MoFPI) , the authority for formulation and administration of the rules ,regulations and laws guiding the food processing segment in India was set up in the year 1988. In 2001, the Government of India launched the programme of establishing Agriculture Export Zone (AEZ). Agricultural and Processed Food Products Export Development Authority (APEDA) was constituted in 1985 as the nodal agency to promote the setup of AEZ. These incentives created a favorable environment for investments and exports in the sector.[12]

With the rapid development in the economy, more disposable incomes and changing lifestyle patters, there is an increased demand for the processed foods. In addition there is a huge export potential of these foods which India produces in abundance due to its vast diversity in agro climatic zones. Hence these industries have a great potential in terms of employment generation and contribution to the GDP.

The Government of India has focused on various policy initiatives in the sector which provides initiatives for capital grant, duty free export and tax incentives. Some of the major schemes which are being run by MoFPI are Mega Food Parks Scheme, Integrated Cold Chain and Modernisation of Abattoirs scheme. It may be noted that fund allocation to MoFPI in 10th plan was US\$ 37.5 million that was revised to US\$ 1088.5 million in the 12th plan. [13]

The creation of Cold Storage facilities would prevent distress sale of crops, allow better price realization. In addition, the warehouse receipt could be utilized to secure credit from banks. This may indirectly promote food processing sector, increase the demand for farm produce, increase the availability of food during off season. This in turn lead to better price realization.

RESEARCH OBJECTIVES

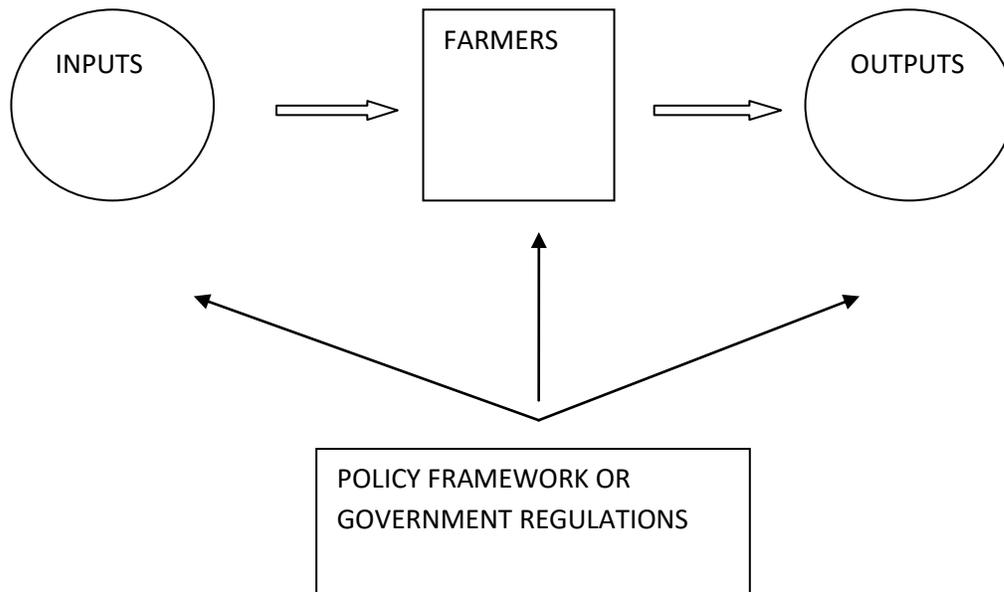
1. To review the current conditions
2. To identify the gaps
3. To suggest possible steps to be taken/considered for policy formulation or implementation

RESEARCH METHODOLOGY

As the nature of the present study is largely exploratory, data were collected from secondary sources.

FINDINGS AND ANALYSIS

On analyzing the structure and processes that affect the farmer, it was found that political framework and will was in place to facilitate the rural economy. However at some points during the implementation phase, some additional features in terms of rules and regulations were required to be introduced in order to ensure that the desired objectives are achieved.



Government regulations do exist in facilitating good quality input. There may be instances where the farmer is unable to reap the benefits due to the lack of awareness. Hence the government must create a pool of more proactive extension officers. At the output end, regulatory framework has been introduced which would provide competitive prices to the farmers and also reduce the wastages. In addition, the government policies were in place to assist the farmers in case of unforeseen calamities such as floods or drought.

RELEVANCE OF STUDY/IMPLICATIONS FOR THEORY AND PRACTICE

As per the Economic Survey, the contribution of Agriculture in the GDP was 17.4% during 2015-16. Agriculture is the principal source of livelihood for more than 58% of the population of India. Hence the study primarily focuses on methods of improving the conditions of the majority of the rural population. It also focuses on areas to be worked upon and also provide ideas for setting up new projects in areas hitherto less explored.

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