



## Knowledge Paper on “Bio-Control Management- Opportunities and Challenges in Punjab”



## Back in Time

In 1926, the Royal Commission of Agriculture was set up to examine and report the status of India's agricultural and rural economy. The Commission made comprehensive recommendations, in its report submitted in 1928, for the improvement of agrarian economy as the basis for the welfare and prosperity of India's rural population. The net sown area in erstwhile British India was reported as 91.85 million hectares and cattle including buffaloes numbered 151 million. Almost 75 per cent of the cultivated area was under cereals and pulses, **with rice and wheat occupying 46 per cent of the net sown area**. The area under fruits and vegetables was about 2.5 per cent and that under oilseeds and non-food crops was about 20 per cent.

Almost 40 years later, free India appointed the National Commission on Agriculture in 1970, to review the progress of agriculture in the country and make recommendations for its improvement and modernization. Agriculture, in 1970 provided employment to nearly 70 per cent of the working population. The role of agriculture in the country's economic development and the principle of growth with social justice, were core to the discussions.

**Today Agriculture in India**, is described by a net sown area of 141 million hectares, with field crops continuing to dominate, as exemplified by 55 per cent of the area under cereals. However, agriculture has been diversifying over the decades. Horticulture now accounts for 16 per cent of net sown area. The nation's livestock population counts at more than 512 million.

India today is not only self-sufficient in respect of demand for food, but is also a net exporter of agri-products occupying seventh position globally. It is one of the top producers of cereals (wheat & rice), pulses, fruits, vegetables, milk, meat and marine fish.

The impressive agricultural growth and gains since 1947 stand as a tribute to the farmers' resilience to multiple challenges and to their grit & determination to serve and secure the nation's demand for food and raw material for its agro-industries.

It is an irony, that the very same farmer is now caught in the vortex of more serious challenges. Large tracts of arable land have turned problem soils, becoming acidic, alkaline & saline physico-chemically. Another primary factor of production, namely, water is also under stress. Climate change is beginning to challenge the farmer's ability to adopt coping and adaptation measures that are warranted. India's yield averages for most crops at global level do not compare favorably. The costs of cultivation are rising. The magnitude of food loss and food waste is alarming. The markets do not assure the farmer of remunerative returns on his produce. In short, sustainability of agricultural growth faces serious doubt, and agrarian challenge even in the midst of surpluses has emerged as a core concern.

At the basic level, agriculture when defined as an enterprise comprises two segments – production and post-production. The success of production as of now amounts to half success, and is therefore not sustainable.

A Strategic sequential concerns:

- Sustainability of production**
- Monetization of farmers' produce**
- Re-strengthening of extension services**
- Recognizing agriculture as an enterprise and enabling it to operate as such, by addressing various structural weaknesses.**

## **Evolution of Indian Agriculture**

India has been an agriculture-based economy. Though in absolute terms agricultural GDP is growing, as a ratio of the total GDP of the economy it has been declining. Simultaneously notwithstanding that percentage of population dependent on agriculture declined to 48 per cent in 2011, from a high of 85 per cent in 1951, seen in terms of absolute numbers, a sizable population is still dependent on agriculture for its livelihood. Since this sector influences the lives of the entire population, several efforts have been made since independence to evolve appropriate agricultural policies affecting both the producers and the consumers. Given the food deficiency that prevailed and the continued growth of population since independence, the growth strategy for agriculture has been production-centric. The sector received incentives, that have helped the nation to achieve high levels of production for its food security.

### **Various Commission and Committee Reports have influenced the agricultural policies of the country beginning with pre-Independence period.**

The first ever Commission was the Royal Commission on Agriculture constituted in 1926 under the chairmanship of Victor Alexander John, which was mandated primarily to examine and report on the condition of agricultural and rural economy in British India and to make recommendations for agricultural improvement. The Commission submitted its Report in 1928. The first ever Committee, Food Grains Policy Committee (1943) was constituted under the chairmanship of T. Gregory, which mainly focused on food availability, supplies, distribution and control prices, which were the main challenges due to the Second World War. The country also faced severe food shortage due to lower yield levels and the problem of refugees immediately after attaining Independence, when the Government appointed a committee under P. Thakurdas in 1947. Also known as the Foodgrain Policy Committee (1947), it studied the aspects related to food distribution, and the main features of its recommendation were gradual withdrawal of control and removal of restrictions on movements of food grains. Various other Committees followed thereafter. These include Maitra Committee (1950), Mehta Committee (1957), Venkatappaiah Committee (1966). These were mandated to enquire into food and distribution problems and solve the issues. The recommendations of these Committees played important role in the formulation of subsequent agricultural policies.

The policies that came to make a major and long-standing impact in the agriculture sector were adopted in mid-1960s. These measures adopted included production subsidies, minimum support prices, public procurement, storage and distribution of food grains, as also trade protection. During the 1960s and 1970s, widespread adoption of high yielding rice and wheat varieties was promoted in response to glaring food deficit situation in the country. The country also expanded its irrigated area, promoted increased use of chemical fertilizers and pesticides, and improved access to institutional credit. Such a comprehensive policy package led to considerable rise in agricultural production making India self-sufficient in foodgrains at the national level.

The first comprehensive agricultural policy was brought out by the National Commission on Agriculture constituted under the chairmanship of N. R. Mirdha, which submitted its Report in 1976. It mainly emphasized on production, land and water development by addressing the conservation and issues of water management. Land reclamation and harvesting of ground water, development at animal husbandry & fishery sector, besides forestry were recommended. Development of subsidiary activities like poultry, piggery, sheep and goat rearing were also emphasized. Further, it gave thrust on research, education and training for promotion of agriculture and its application to field conditions. Along with the sectoral development, promotion of employment potential in the agricultural sector was also a concern. A Committee chaired by Bhanu Pratap Singh in 1990, made recommendations covering all major sectors of agricultural economy and provided the base for the first draft of agricultural policy resolution, which paved the way for introduction of the first ever comprehensive National Agricultural Policy in 2000.

Then came the National Commission on Farmers (NCF) constituted in 2004, which comprehensively studied the food situation, mostly addressing concerns regarding supplies for the public distribution system and those related to production and productivity. Several recommendations were made by the Commission for reforms in the Indian agriculture. Many of these related to land reforms, irrigation, productivity enhancement through increase in public investment in agriculture related infrastructure, particularly in irrigation, drainage, land development, water conservation, research & development and road connectivity. The Commission also laid stress on timely and adequate supply of credit to farmers, and improving food security for the consumers by addressing of micronutrient deficiency and adoption of an integrated food-cum-fortification approach. The Commission also made an important suggestion to recognize farmer as an important stakeholder.

## **How Punjab figures in Modern Day Indian Agriculture**

Agricultural output as a highest share of the state output is in case of Madhya Pradesh with a ratio of 28 per cent. In Punjab, Uttar Pradesh and Andhra Pradesh, the shares range between 20 per cent and 25 per cent.

The share of income from crop cultivation is relatively higher in Punjab, Haryana, Chhattisgarh, Madhya Pradesh, Uttar Pradesh and Uttarakhand; this is least in case of Jammu & Kashmir, Tamil Nadu and West Bengal.

In Punjab, the state with highest farmer income in the country, the share in income among crop cultivation, farming of animals, wages and non-farm income stands at 60, 9, 26 and 4 respectively.

**Paddy:** States practising Irrigated paddy growing states have definite yield advantages. Among major paddy producing states, Punjab and Andhra Pradesh grow almost the entire crop under irrigated conditions (paddy area under irrigation in these states are 99.6 per cent and 96.8 per cent during 2012-13, respectively).

**Wheat:** All major wheat producing states grow almost the entire crop under irrigation, and hence, offer limited scope to expand irrigation based cultivation. While Madhya Pradesh has 91 per cent area under irrigation, Uttar Pradesh, Punjab, Haryana and Rajasthan have more than 98 per cent wheat area under irrigation. Average yield levels are around 50 qtl/ha in Punjab and Haryana. In Uttar Pradesh and Rajasthan, it stands around 30 qtl/ha and in Madhya Pradesh it is 24 qtl/ha during 2013-14. Hence, efforts to achieve high wheat production seem to depend on factors other than irrigation.

The states of Punjab and Haryana though geographically small still have a large number of regulated markets. Increasing of farmers' incomes requires that adequate infrastructure is provided nearer to farmers' fields, connecting smallholders to the markets and strengthening supply chain linkages. Farmers' income is closely linked to market infrastructure. Small and marginal farmers in particular require good market nearer their farming gates, with robust market linkages.

## **Ironically, it's 2020 Intl. Year of Plant Health and here we're in The State of Punjab!**

***The United Nations General Assembly declared 2020 as the International Year of Plant Health (IYPH).***

***The year is a once in a lifetime opportunity to raise global awareness on how protecting plant health can help end hunger, reduce poverty, protect the environment, and boost economic development.***

## **IPPC and the International Year of Plant Health**

At the 10th Session of the Commission on Phytosanitary Measures (CPM-10) in 2015, Finland proposed to establish an International Year of Plant Health (IYPH) in the year 2020. The proposal received strong support from the CPM-10, which decided to pursue the proclamation of the IYPH in 2020 under the leadership of Finland.

CPM-11 (2016) adopted the scope of plant health in the context of IYPH, *"usually considered the discipline that uses a range of measures to control and prevent pests, weeds and disease causing organisms to spread into new areas, especially through human interaction such as international trade"*, and **the IYPH overall objective "to raise awareness of the importance and impacts of plant health in addressing issues of global importance, including hunger, poverty, threats to the environment and economic development"**.

In December 2018, the United Nations General Assembly adopted the resolution A/RES/73/252 declaring 2020 as the International Year of Plant Health (IYPH). The year is a once in a lifetime opportunity to raise global awareness on how protecting plant health can help end hunger, reduce poverty, protect the environment, and boost economic development.

## **PROTECTING PLANTS, PROTECTING LIFE**

Plants are the source of the air we breathe and most of the food we eat, yet we often don't think about keeping them healthy. This can have devastating results. FAO estimates that up to 40% of food crops are lost due to plant pests and diseases annually. This leaves millions of people without enough food to eat and seriously damages agriculture - the primary source of income for rural poor communities.

Plant health is increasingly under threat. Climate change, and human activities, have altered ecosystems, reducing biodiversity and creating new niches where pests can thrive. At the same time, international travel and trade has tripled in volume in the last decade and can quickly spread pests and diseases around the world causing great damage to native plants and the environment.

Protecting plants from pests and diseases is far more cost effective than dealing with full-blown plant health emergencies. Plant pests and diseases are often impossible to eradicate once they have established themselves and managing them is time consuming and expensive. Prevention is critical to avoiding the devastating impact of pests and diseases on agriculture, livelihoods and food security and many of us have a role to play.

### **Taking an ecosystem approach**

*We can both prevent plant pests and diseases, and tackle them, in environmentally friendly ways - such as through integrated pest management. This ecosystem approach combines different management strategies and practices to grow healthy crops while minimizing the use of pesticides. Avoiding poisonous substances when dealing with pests not only protects the environment, it also protects pollinators, natural pest enemies, beneficial organisms and the people and animals who depend on plants.*

## **From Pioneering the Green Revolution to Discussing Biological Solutions to Sustain its Agriculture**

The Green Revolution in India refers to a period when Indian agriculture was converted into an industrial system due to the adoption of modern methods and technology such as the use of high yielding variety (HYV) seeds, tractors, irrigation facilities, pesticides, and fertilizers.. This was part of the larger Green revolution endeavor initiated by Norman Borlaug, which leveraged agricultural research and technology to increase agricultural productivity in the developing world.

The Green Revolution within India commenced in 1958 that led to an increase in food grain production, especially in Punjab, Haryana, and Uttar Pradesh. Major milestones in this undertaking were the development of high-yielding varieties of wheat, and rust resistant strains of wheat

The Green Revolution in India was first introduced in Punjab in the late 1960s as part of a development program issued by international donor agencies and the Government of India.

During the British Raj, India's grain economy hinged on a unilateral relation of exploitation.[10] Consequently, when India gained independence, the weakened country quickly became vulnerable to frequent famines, financial instabilities, and low productivity. These factors formed a rationale for the implementation of the Green Revolution as a development strategy in India.

The Green Revolution yielded great economic prosperity during its early years. In Punjab, where it was first introduced, the Green Revolution led to significant increases in the state's agricultural output, supporting India's overall economy. By 1970, Punjab was producing 70 percent of the country's total food grains,[13] and farmers' incomes were increasing by over 70 percent.[13] Punjab's prosperity following the Green Revolution became a model to which other states aspired to reach.[14]

However, despite the initial prosperity experienced in Punjab, the Green Revolution was met with much controversy throughout India.

*The recent concerns being raised in this beautiful and prosperous State of Punjab with respect to the detrimental impact of the Green Revolution by the use of chemical agri-inputs is a pity. A pity since all the efforts placed in by the farmers of this State tend to be washed away in just one sentence. A Pity!! Punjab coined with the success of the Green Revolution and its adoption around the country is now faced with criticism.*

The use & misuse, over application of such agro-chemicals has resulted in an abuse of the environment as a whole. The State Agriculture Departments' efforts to curtail such allegations and concerns being raised by a section of the society by imposing restrictions or bans on the use of selective agri-inputs.

***That too to an extent wherein new agri-inputs too face introductory issues for their availability in the State itself becomes an issue.***

## The QUESTION REMAINS

‘Time to think or Rethink’

Lets just ponder on the issue and explore the World of Biologicals in Crop Production & Protection towards a Pathway leading us to achieve sustainability in this Prosperous State of Punjab.



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