



GROUNDWATER DEPLETION AND AGRARIAN CRISIS IN PUNJAB ECONOMY

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Abstract

Punjab is predominantly Agrarian state. Punjab agriculture is known for Green Revolution of the late 1960s and 1970s. Punjab has recorded significant agriculture growth since the period of Green Revolution and known with the title of “India’s Breadbasket”. Punjab, the most prosperous state in the country until recently, is in the midst of a severe economic crisis. The adaptation of new agriculture strategy limited the state to only two crops, wheat and rice. The use of fertilizers, pesticides, insecticides and fungicides has increased. It has led to depletion of ground water, ecological destruction and forced living under the burden of debt. It leads to extreme poverty and forcing them to commit suicide. The need for agriculture diversification and adopt a pro-people and pro-nature model to address growing poverty, hunger and inequalities in India.

Keywords: Punjab Agriculture, Green Revolution, Groundwater Depletion, Ecological Destruction

Punjab is predominantly Agrarian state. Punjab agriculture is known for Green Revolution of the late 1960s and 1970s. Green Revolution is resulted of New Agriculture Technology which is packages of high yielding seeds, guaranteed irrigation, chemical fertilizers, pesticides, fungicides and other chemicals, machinery and modern farming methods. Punjab has recorded significant agriculture growth since the period of Green Revolution and known with the title of “India’s Breadbasket”. Punjab, the most prosperous state in the country until recently, is in the midst of a severe economic crisis. The Punjab model of agricultural modernization was born out of a food shortage in the 1960s, when a country that lacked the resources to buy from abroad had to seek food aid from the United States under PL480. Around the same time, India fought an unexpected war with China in 1962, had two consecutive droughts in 1964-65 and 1965-66, and fought another war with Pakistan in 1965. The U.S., a major food donor, has threatened India with withdrawing food aid unless the country accepts the policies proposed by western powers towards Pakistan. Due to drought and resources diversion, India’s domestic food grain production in 1965-66 was 72 million tons, while the market demand was about 90 million tons. Considering the income level and distribution, there is a gap of about 20 percent between market demand and domestic grain production. Those cannot be filled by imports. The country lacks the resources to buy food grains. Aside from the foreign exchange difficulties, the sheer logistic of transporting and distributing such a large amount of food is not easy task. Food imports rose

sharply from 3.5 million tons in 1961 to 6.27 million tons in 1964 and reached an all-time high of 10.36 million tons in 1966. (Sidhu, 2002).

There are only two ways to increased food production. One option was to implement sweeping land reforms to redistribute land, as it is ultimately determined that smaller land holdings are more productive than larger ones and reallocating land in favor of smaller landowners and landless laborers will lead to an increase in total output. Alternatively, the country must find, within framework of existing institutions, a technological solution to the country's chronic food shortage through the use of seeds of high yielding varieties and a package of cheap subsidized inputs, along with credit, guaranteed remuneration prices to farmer's and the central governments sponsors a mechanism to clean up surplus food to create a food supply system that can take care of the vulnerable in the society. Given the class structure of the Indian state, any radical land reform is not possible, especially without pressure from small farmers and landless laborers who lack organizing power. In this case, India adopted for the second option. This alternative is also touted by many western scholars sponsored by the Food Foundation and the Rockefeller Foundation as a strategy suitable for India's chronic food shortage without disrupting the balance of political power. The Union Government was decided to adopt new agricultural techniques, studied the various aspects in different region of the country and adopted by hardworking farmers, farm laborers, and small rural artisans in Punjab. Considering abundant natural resources, fertile land, proper water table, climate conditions favorable for different crops, priority is given to Punjab. Since the advent of the Green Revolution in the mid-1960s, the Punjab economy has undergone significant structural changes (Satish, 2006). The Punjab economy has witnessed accelerated economic growth and increased per capita income (Jodhka, 2006) and declining rural poverty levels (Satish 2006, Jodhka 2006). This is possible because the Green Revolution was a period of transformation of Indian Agriculture into an industrial system. Nonetheless, currently the agriculture in Punjab has been going through an unprecedented agricultural crisis and also suffers from socio-economic problems in the form of farmers and agricultural laborers suicide. With the fruits of the Green Revolution fading away and currently in the midst of a severe agricultural crisis, Punjab farming is no longer a viable and lucrative profession (Bhangoo, 2005, Dutta, 2012, Rangit et al., 2005, Sidhu, 2002, Singh, 2007, Singh and Singh, 2012). The main goal is to achieve food security through scientific methods. However, little or no effort has been made to educate farmers about the high risk associated with intensive pesticides and fertilizers use.

An agricultural crisis has emerged and manifested itself in the form of farm suicides. The farmer suicides were first reported by the media in Karnataka, Kerala and Andhra Pradesh. But in a prosperous state like Punjab, reports of their suicides are unexpected (Singh, 2000). Suicides have been observed in rural Punjab since the mid-1980s (Gill, 2005). The liberalization and globalization introduced in the early 1990s further exacerbated the crisis of the capitalist economic development path in the agricultural economy (Gill and Singh, 2006). Policies in the post-liberalization period adversely affected agriculture as farmers perished in a large numbers (Suri, 2006). Suicides in farm communities in Punjab, especially in Malwa region, have been in the headlines for many years (Bhangoo, 2006). In recent years, many farmers in the state have committed suicide, most of them related to debt problems (AFDR, 2000, Iyer & Manick, 2000, Kumar and Sharma, 2006).

Punjab is the food bowl of the country with a contribution of more than 40 percent of the central pool of wheat and 26 percent of rice. Agriculture contributes to the economy with about 21 percent of GSDP against an all India figure of 14 percent.¹ But now Punjab pays the price for food security. The costs of food security Punjab has paid include cancer, kidney failure, stillborn baby and birth defects. In view of Punjab's outstanding contribution to central grain reserve, the Central Government implemented a Minimum Support

¹ <http://pbindustries.gov.in/thrustsectors/manufacturingindustry/foodprocessingindustries>

Price Strategy for agricultural products in 1973. Rice/ paddy is not suitable for the agro-climatic conditions of Punjab. The use of pesticides and fertilizers caused many health problems for the state's population. The excessive use of fertilizers and pesticides resulted the polluted of air, soil and ecologically degradation.

Groundwater depletion in Punjab is a growing concern. Ground- water levels in much of the state have dropped to dangerous levels. Rice cultivation in the state is the root cause of the problem.

The use of groundwater for agricultural irrigation is one of the most important factors leading to groundwater depletion. Groundwater in most parts of Punjab is no longer drinkable. Without water, life is impossible, so water is the elixir of life. The people of Punjab are still suffering due to declining groundwater level and it is not easy to predict what will be severe shortage of groundwater for people of Punjab in the future. Before the introduction of "The New Agricultural strategy" in Punjab, irrigation was done with canals and wells and there were no serious problems with the water table. In Punjab, only 27 per cent of area use canal water for irrigation, and the remaining 73 per cent rely on tube wells. In 1961, the number of tube wells in Punjab was only 7,445. By 2021, that numbers has risen to around 1.5 million, largely due to adoption of this technology.² Initially, after the adoption of 'The New Agricultural Strategy' irrigation was done with diesel, engine and integral motors. But the farmers were forced to bring in submersible motors due to falling water table, which is one reason they are heavily in debt.

Today, farmers have to use their own or rented tractors to drive submersible motors due to insufficient electricity supply, and high diesel prices have become of the reasons why farming has become a loss-making profession. Desertification is currently Punjab agriculture's largest issue. Desserts are emerging from fertile terrain due to a falling water table. A Punjab Government report from 2018 states that approximately 79% of the state's groundwater resources are overused, and that by 2039, the groundwater supply is expected to run out entirely, leaving only yearly replenish able resources for human use. Punjab's groundwater resources were evaluated block-by-block by the Central Government Water Board in 2020. According to the report, only 17 of the 150 blocks that were evaluated, had groundwater levels that were considered to be in the "safe" zone. There were "over-exploited" groundwater resources in up to 133 blocks, with at least six of those being in the "critical" Zone. According to the Central Groundwater Board's guidelines, "critical" denotes that more than 90% of the groundwater resources have been drained, while "safe" denotes that fewer than 70% have. By 2029, Punjab's groundwater reserves in the top 100 meters—often referred to as the "good quality" mark—are probably going to run out. Additionally, it will fall below 300 hundred meters by 2039, at which point the water's quality is too tainted to be useful for anything.³

In India, in 2012-13, marginal farmers with less than 2.5 acres accounted for 68 percent and small farmers with less than 2.5 to 5 acres accounted for 18 percent. In 2018-19, the number of marginal farmers increased to 71 percent and the number of small farmers fell to 17 percent. As a result, the proportion of marginal and small farmers, which was 86 percent in 2012-13, increased to 88 percent in 2018-19.⁴ The rise of new class in Rural India who owns land but do not cultivate it. The proportion of cultivators in the agricultural sector has declined and the proportion of non-cultivators who depend on the other sources of income has increased. Such non-farming landowners are known as India's "new landowners". The land occupancy rate of semi-middle, medium and small farmers has continued to decline, leading to an increase in the proportion of marginal farmers. In this regard, the fact is that, due to the economic and agricultural policies adopted by the country, agriculture is operating at a loss, although the proportion of marginal farmers has increased, a large number of marginal farmers have become agricultural laborers. For small and marginal farmers in Punjab, farming is a definite death. They can't handle the rising costs,

² Singh, Gian (2002): "Punjab Assembly Elections 2022: Ignoring the groundwater depletion problem", 27 Jan.

<http://www.downtoearth.org.in/blog/water/punjab/-assembly-electins-2022-ignoring-the-groundwater-depletion-problem-81286>

³ "What the Punjab Farmer Want is not What the Punjab Farmer Needs", The Economic Times. <https://m.economictimes.com>

⁴ Singh, Gian (2021): "Farmers And Agricultural Laborer's Suicides- Time For Governments And Society To WakeUp", 31 October. <https://countercurrents.org/2021/10/farmers-and-agricultural-labourers-suicides-time-for-governments-and-society-to-wake-up/>

fluctuating prices and climate changes, or the debt that comes with buying machines. Small and Marginal farmers in Punjab are in crisis as farming is not viable for them due to increasing input costs, stagnant productivity, declining profitability and rising cost of living. Agricultural conditions appear to be against marginal farmers who are too poor to farm.⁵The new agriculture model which is based on purely capitalist economy is not suitable for environmentally and ecologically. Point out that every year in Punjab and adjoining states, a large number of deaths are caused by road accidents and health disasters caused by smog from rice harvesting. The Green Revolution led to depletion of fertile land and the erosion of natural crop diversification. In fact, the land, air, water and economy of Punjab have deteriorated to a large extent recently, which has a devastating impact on people's lives. A few decades ago, the Punjab economy was generally ahead of all other states in the nation due to natural crop diversification, fertile soil, clean air and water, and a healthy environment. The status of Punjab has declined due to the agricultural policies of the government, especially the federal government. Youth of Punjab are going to abroad due to lack of employment opportunities and very low standards job. This phenomenon is depriving Punjab of knowledge, capital and demographic benefits that people are paying dearly for now and it is very difficult to predict the future of Punjab due to this phenomenon. Punjab to take crop diversification, instead of sowing and planting a mono-crop of wheat-rice combination, sow and plant a combination of crops such a wheat-maize, wheat-cotton and other suitable crop combination which need for irrigation is less than the paddy. Justice should be done for the Punjab river waters. Therefore, the Riparian principle of water separation should be adopted by the Government. Government should follow the land reforms which is favorable in the small and marginal farmers. The benefits of the land reforms should be given to the actual cultivators of land. To do this, the Central Government must determine reasonable crop prices and ensure that crops are purchased at those prices. The Central Government has been determining MSPs for 23 commodities.

Although the marginal and small farmers have a very small marketed surplus, the Central Government should ensure the remunerative prices for the farmers. At the same time, procurement prices must be secured to protect small and marginal farmers from market exploitation. The Government has to give the first priority to marginal and small farmers by providing subsidies, concessions and grants. Education helps humans understand and solve the problem they face. Healthcare delivery increased human efficiency and performance.

Government should ensure that public institutions provide both services to all sectors, including marginal and small farmers. Research and Development (R&D) play an important role in reducing the cost of agricultural production. The increasing use of machinery and herbicides in the New Agricultural Strategy has reduced the employment opportunities of the farmers and laborers in agriculture sector. To overcome this, Government should not only ensure 100 days of employment for the rural poor (including marginal farmers under MGNREGS), but also increase the number of working days advertised to gain employment as needed in the segment, and wages paid under MGNREGS should be equal to minimum Government-mandated wages. The Central and State Government are responsible for ensuring that agricultural related research and development activities are carried out in public institutions. To solve the problems in the agricultural sector, the Government must adopt a pro-people, pro-nature economic model rather than a pro-capitalist one.

⁵ Reddy, B. and Shaw A. (2012): "Rise of 'New Landlords': A Rejoinder", Economic and Political Weekly, Vol. 47, No. 21, <https://www.epw.in> 26 May.

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