Economic and Social implications of Green Revolution in Punjab (India) after Liberalization.

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Abstract: - This research investigates the socio-economic effects of the Green Revolution (GR) and subsequent agricultural transformations on farmers in Punjab, with a particular emphasis on small and marginal farmers. Initially, the GR boosted yields and incomes mainly for large landowners, while smaller farmers encountered difficulties due to rising debts and limited access to formal credit. After the opening of Indian economy in early 90s, despite an increase in institutional loans from 1990 to 2006, many small farmers became increasingly dependent on non-institutional credit from moneylenders and commission agents. The high costs of inputs—such as diesel, fertilizers, and machinery—coupled with low crop returns exacerbated financial hardships, resulting in widespread indebtedness and a rise in farmer suicides. Social issues, including the costly dowry system and pressures associated with loan repayments, further encumber farmers. Government assistance programs frequently overlook many indebted farmers because of the informal nature of their loans. The widening disparity between large and small farmers has heightened economic inequality and diminished the availability of agricultural labor. Additionally, the heavy reliance on subsidized inputs for rice and wheat cultivation has led to environmental degradation. In response, both government and NGOs were are advocating for crop diversification and sustainable agricultural practices; however, small farmers continue to grapple with entrenched challenges such as debt, restricted access to credit, and mechanization, all of which persist in influencing Punjab's rural economy and agricultural landscape.

Keywords: - Green Revolution (GR), Farmer Indebtedness, Small and Marginal Farmers, Non-institutional Credit, Input Cost Inflation, Farmer Suicides, Subsidy Inequality, Crop Diversification

Introduction:-

Economic and social changes following the Green Revolution (GR), along with recent advancements like genetically modified (GM) seeds, have primarily benefited the wealthier sectors of rural society that already had land and capital. In contrast, small and marginal farmers, who had less or no resources, gained little from these developments and many have struggled to keep their farms afloat. While the initial success of the GR led to significant increases in per capita income for large farmers and reshaped the state's socio-economic structure, today's farming economy is marked by record-high debt levels among farmers. Institutional loans owed by farmers rose from approximately 25 percent of the Net State Domestic Product (NSDP) from agriculture and livestock in 1990, to more than 38 percent, or Rs. 124 billion, by 2006. However, this represents only half of the total debt, as about 50 percent of credit needs are met through non-institutional sources, primarily commission agents. Large-scale farmers benefit from institutional credit, while small and marginal farmers often rely on commission agents or moneylenders for both agricultural and social credit.[1]

The central government introduced policy measures in the Union Budget of 2008–09 aimed at reducing the debt of marginal and small farmers who owe money to state, commercial, and regional rural banks, as well as cooperative credit institutions. However, most farmers do not benefit from this assistance, as their loans are not with these institutions.[2]Farmers are forced to take out increasingly larger loans and struggle with repayment due to the sharp rise in the prices of farm inputs and other expenses, such as diesel, which have grown significantly compared to the income they earn from their crops. Over the past decade,(from 1998-2008) the price of diesel has surged around from Rs. 10 to Rs. 30 per liter, urea has risen from Rs. 70 to Rs. 250 for 50 kilograms, and DAP has gone up from Rs. 180 to Rs. 450 for 50 kilograms. Tractors, which once cost between Rs. 6,000 and Rs. 7,000, now cost much more, with a tractor priced at around Rs. 400,000 and a trolley costing about Rs. 50,000. One farmer shared that a tractor they bought for

[1] Finger R, El Benni N, Kaphengst T, Evans C, Herbert S, Lehmann B, Morse S, Stypak N. A meta-analysis on farm-level costs and benefits of GM crops. Sustainability. 2011;3:743–762.
[2] https://www.indiabudget.gov.in/budget_archive/ub2008-09/bs/speecha.htm

Rs. 176,000 a few years ago now costs around Rs. 800,000. Although new state governments often announce better prices for farm produce, farmers say these rates are still not enough to cover the rising input costs, which increase almost daily. From 2001 to 2006, the cost of cultivating rice rose by 5%, and wheat cultivation saw an 8% increase in costs during the same period.[3]

Objectives of the Study:-

To investigate the differential effects of the Green Revolution and subsequent technological innovations, such as genetically modified seeds, on different categories of farmers, particularly by contrasting large-scale farmers with small and marginal farmers.

1. To analyze the escalating levels of farmer debt within the agricultural sector, emphasizing the sources of credit (institutional versus non-institutional) and the consequences for small and marginal farmers.
2. To evaluate the effectiveness of governmental policy initiatives, including the 2008–09 Union Budget measures, designed to alleviate the debt burden faced by marginal and small farmers.
3. To explore the trends in agricultural input costs (such as diesel, fertilizers, and machinery) over the last decade and their effects on the financial viability of farming operations.
4. To assess the correlation between the rising costs of farm inputs and the prices that farmers receive for their products, underscoring issues related to income inadequacy and economic distress among farmers.

Methodology:-

This articles depends upon both primary and secondary data drawn from books, journals, NGO's working with farmers in Punjab region and interaction with farmers in different areas of Punjab.

[3] https://openknowledge.fao.org/server/api/core/bitstreams/705b366a-6fd5-4dba-9b05-6fd01ed72a93/content

Changing socio-economic equations:-

One farmer from Bhatinda region of Punjab described the situation by saying, “Our income has decreased; we keep applying urea to the fields to get a crop, but the yield keeps falling because the soil is exhausted from using the same inputs we’re paying high prices for.” In the southwestern cotton belt, most farmers conduct their transactions with commission agents or moneylenders. These agents lend money to farmers, sell them seeds, fertilizers, and pesticides on credit, and later buy their harvest. The agent earns a 2% commission when they sell the farmer’s crop. Due to factors like a lack of storage, the need to repay debts, and the reliance on commission agents, farmers are vulnerable to fluctuations in crop prices. For example, in 2024, when fresh cotton hit the market, farmers sold it for Rs. 6620 to Rs. 7020 per 100 kilograms, depending on the variety. But once the cotton was no longer available in the market, prices jumped by Rs. 1,000 per 100 kilograms. A similar price increase occurred with wheat. The government procured wheat for around Rs. 2,100, but once farmers had sold their stocks, it was resold for Rs. 3,200 per 100 kilograms. One farmer lamented, “If we can’t find a buyer, we end up selling it to the moneylender at a much lower price, and then they hold onto it and sell it later when prices go up.” Moneylenders have this economic flexibility to earn additional income from such transactions. Normally, the government buys wheat and rice, pays the moneylender, and then the moneylender settles the accounts with the farmer. The biggest cause of farmers' indebtedness is capital and current farming expenses, which account for nearly 80% of outstanding loans. Family events, such as marriages, contribute to 11% of the debt, medical expenses account for 3.4%, and education costs make up 0.8%.[4]

Marriages in rural areas are costly due to the dowry system, and there is significant social pressure to hold lavish weddings and provide a generous dowry. One farmer admitted, "We spend more than we can afford." Many farmers rely on unregulated moneylenders who often operate without formal records, leading to suspicion about their practices. When farmers need loans for a marriage or ceremony, without crop security, moneylenders sometimes ask them to sign blank promissory notes, where the loan amount and date are left blank. Several farmers explained that the moneylender later fills in the amount, potentially doubling it, and demands repayment. As one farmer stated, "Because we've signed the document, the lender can take us to

[4] **Vandana Shiva** *"The Violence of the Green Revolution"*,(P.P 10-15)

court anytime." Those with land can access loans from banks at an interest rate of 7-12%, while moneylenders charge 24-36%. If farmers cannot get loans from banks or moneylenders, they may take out loans to buy tractors or other equipment, which they later sell at a loss to landowners for cash. This can lead to deeper debt problems, especially for farmers without reliable access to moneylenders.

The farmer Unions :-

Few farmer from Malwa belt of Punjab shared, "they owed around Rs. 80,000 to a moneylender after selling their crop. He refused to lend me money for the next crop," even though he had always repaid his loans in the past. The social pressure and gossip in the community led to this refusal. He ultimately located a different moneylender; however, transitioning between lenders proved to be challenging, and he faced difficulties in managing household expenses. The Bharatiya Kisan Union (BKU), an independent farmers' union, was formed by politically engaged farmers who felt that the state's leadership failed to address their economic issues related to the Green Revolution. The BKU's Punjab branch became independent in 1980, although it had been operational under its predecessor since 1972. While the BKU has organized seminars on issues like farmer suicides and the effects of agrochemicals, some farmers, like Surinder Singh, feel that the union's primary concern is raising the minimum support price, not organic farming. In Bathinda, small farmers I spoke to were not members of the BKU, though they acknowledged its presence in many areas. The union has actively campaigned against rising input costs without a corresponding increase in crop prices. Farmers noted that the BKU has a strong influence but is now pressuring farmers to avoid repaying their loans and supporting them when they refuse to do so. However, some farmers felt this approach harmed their relationships with moneylenders, whom they relied on to sell their crops and buy inputs. If moneylenders fear that union members might default on their loans, they may refuse to lend or assist in selling crops. The BKU doesn't offer financial aid but helps farmers by supporting them in disputes with moneylenders, particularly in cases of farmer suicides, where the union may accuse moneylenders of threatening the farmers. In such cases, the union may pressure moneylenders to pay money and cancel loans to avoid legal action.[5]

[5] **P. Sainath** *"Everybody Loves a Good Drought"*, (p.p 56-65)

Framer suicides:-

Between 1988 and 1997, the suicide rate among farmers in Punjab was higher than the general suicide rate, reaching 3.17% during that period, although it has since declined. The general suicide rate rose from 0.57% in 1988 to 2.04% in 2001, according to a 2006 report by the Punjab State Farmer Commission (Kumar et al., 2006). The report also highlighted that districts in the cotton belt, including Bathinda and Faridkot, had a particularly high incidence of farmer suicides between 1991 and 2005. The actual numbers might be even higher since not all suicide cases are officially recorded as such. Farmers pointed out various factors contributing to suicides, with many linking them to crop failure. From 1997 to 2002, during the "worm period" when the American bollworm devastated crops, farmers spent heavily on chemicals, leading to financial strain and, in many cases, suicides. In addition to suicides due to overwhelming debt, some were also linked to personal issues such as family problems, health issues, or substance abuse. Many farmers also blamed government policies for exacerbating the crisis, saying that a system where farmers have to go into debt just to produce food is inherently flawed. As one farmer explained, the new farming practices require substantial investment, and when the crops fail to cover these costs, farmers are left in despair with no way to feed their families and workers. Some farmers also noted that the status of farming as a respected profession had declined, especially among younger generations, as traditional family labor on the land was increasingly replaced by machinery and outside labor. While many marginal and small farmers with less than five acres of land struggle to survive, large farmers with ten acres or more are thriving. Between 1995 and 2001, many small farmers sold their land to larger ones, leading to an increase in the average landholding size from 9.4 to 10 acres, while the total number of landholdings decreased from 1.09 million to 997,000.[6]

Farmers leaving agriculture profession:-

Some families from the smallest farms likely end up in urban slums, although most slum dwellers in Punjab are from outside the state. In Punjab, the average slum population in its 28 major cities and towns is nearly 14%, just below the national average of 15%. Ludhiana has the largest slum population at 314,000, followed by Amritsar at 307,000 (Tiwana et al., 2007). In

[6] **Devinder Sharma** *"The Suicide of Indian Agriculture"*,(P.P 40-77)

1961, during the early days of the Green Revolution (GR), agricultural laborers made up 9.65% of the state's total workforce. By 1991, this number rose to 23.31%, but it has since declined to 16.32%. Only 6.22% of agricultural laborers are women. Many laborers are employed seasonally during sowing and harvesting, and are laid off afterward. The overall agricultural workforce, including both laborers and cultivators, dropped from 62.8% in 1971 to 38.95% in 2001, largely due to mechanization and the rice-wheat crop rotation (Tiwana et al., 2007). In Patiala district, larger farmers often hire migrant workers from Bihar for sugarcane harvesting, as local Punjabis are less willing to work in the fields and demand higher wages. One farmer explained, "The Biharis have no other income and will work for whatever they're paid." The average pay for day laborers is Rs. 100 to Rs. 120 per day, with some farmers providing food, typically raw materials for the workers to cook themselves. These workers often live in small huts on the farm during the busy season. Cotton pickers are paid per weight, earning Rs. 10 to Rs. 12 for every 5 kilograms picked, which amounts to Rs. 120 to Rs. 150 per day, slightly above the typical wage. Since 2005, there has been a decline in the number of migrant laborers, resulting in labor shortages for the state during the paddy season (Tiwana et al., 2007).

Poor resource administration:-

The issue of laborers and bonded labor in India is complex and not fully explored here, as most of the farmers I interacted with were small and marginal farmers who typically cannot afford to hire laborers. However, some small and medium farmers in Punjab do hire laborers, and the larger landholders' exploitation of labor from other states, often as unfree labor, has likely been crucial in financing production during the GR (Brass, 1999; Singh, 1997).Punjab offers several subsidies to farmers, with the total input subsidy in 2003-04 amounting to about 10% of the state's GDP from agriculture. The largest portion, 59.7%, goes toward electricity subsidies, which made electricity free for agricultural use from 1997 to 2002 and again from 2005. Much of this electricity is used for water extraction, contributing to the decline in the water table. Fertilizer subsidies account for 37.6%, possibly leading to the overuse of nitrogen fertilizers, while 2.7% is allocated for irrigation. These subsidies, especially in fertilizer manufacturing, also disproportionately benefit larger landholders and the central region, exacerbating regional and income inequalities in the state. Small farmers who operate on less than five acres, which make up 8% of agricultural land, receive about two-thirds the subsidy per hectare compared to medium

and large farmers, those who oversee 70.2% of the land, possessing holdings of ten acres or greater.. Subsidized inputs, such as fertilizer, canal irrigation, and electricity, are primarily used for rice and wheat cultivation.[7]

The harmful wheat- Rice cycle :-

Recognizing the harmful effects of the rice-wheat rotation monoculture on the environment and economy, the Punjab government is exploring crop diversification, including less water-intensive options like citrus, horticulture, and organic farming. In 2006, four "Councils" were established for this purpose, including the Organic Farming Council of Punjab, which set up a model farm in the northeastern district of Ropar to promote organic farming. The council also supported commercial vermi-compost production and offers small subsidies for bio-fertilizers. Additionally, several NGOs, such as Kheti Virasat, have been working on environmental awareness, water conservation, and organic farming practices for over a decade. Other organizations, like the Faridkot-based Kheti Virasat Mission, are also involved in similar efforts across the state.[8]

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