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Socio-Economic Dynamics of Potato Cultivation in Hooghly District, West Bengal: Agrarian Change, Market Volatility, Smallholder Vulnerability, and Sustainability

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Abstract

Potato cultivation occupies a pivotal place in the agrarian economy of Hooghly district in West Bengal. It is not only an important food crop but also a major cash crop that sustains farm income, rural labor demand, transport, packaging, cold storage, and local trade. Yet the same crop is associated with high production costs, strong dependence on irrigation and external inputs, unstable prices, unequal market power, and growing ecological stress.

This revised article examines the socio-economic dynamics of potato cultivation in Hooghly through a mixed-method framework that combines primary survey findings from 200 farmers with secondary evidence drawn from official statistical handbooks, Government of India agricultural statistics, Government of West Bengal planning documents, and relevant scholarly literature. The analysis shows that Hooghly remains one of the major potato-producing districts of West Bengal and that the crop expanded because of favourable alluvial soils, irrigation support, cold storage growth, and proximity to metropolitan markets. At the same time, the benefits of commercialization remain unevenly distributed. Small and marginal farmers dominate the agrarian structure, but they face the greatest exposure to credit dependence, price collapse during harvest, rising input costs, and limited bargaining power. Secondary data further reveal wide fluctuations in area, output, and yield at district level, while primary evidence highlights the continuing centrality of shallow tube well irrigation, dependence on saved seed among resource-poor cultivators, and weak soil-testing practices. The paper argues that the future of potato cultivation in Hooghly is promising but must be made more equitable and sustainable through fairer marketing arrangements, stronger institutional credit, improved extension services, crop-risk support, better water management, and wider adoption of ecologically responsible cultivation practices.

Keywords: potato cultivation, Hooghly district, West Bengal, small farmers, market volatility, cold storage, sustainability

Introduction:

India has been influenced by commercialization, change in technology, integration of markets as well as changing consumption patterns in farming. Amid this broader change, potato has become one of the most significant food and cash crops due to its brief degree of its crop period and the high demand in the market, and contribution to food security and rural livelihoods. According to the official statistics, India has about 57.05 million tonnes of potato production in 2023-24 and 58.11 million tonnes in the third advance estimate in 2024-

25 and West Bengal alone has about 13.76 million tonnes and about 24 percent of the total national output (Department of Agriculture & Farmers Welfare [DA This ascertains the harvesting season, and traders and storage-linked representatives enjoy a reduction in prices and a subsequent upswing later in the season. This imbalance brings about repetitive hardship to the cultivators with no access to capital, formal credit or storage facility. This issue is more acute among the small and marginal farmers who prevail in the agrarian setup in West Bengal and who form the market decisions more based on the debt and urgent cash requirement than on strategic targeting (DWRID, 2024; Pandit et al., 2003; Singh et al., 2005). The current updated text is a reaction to the necessity to present the topic in a more in-depth and publication-competent manner. Rather than describing potato farming in Hooghly descriptively, the paper puts it in a larger context of agrarian change, Introduction of inputs, market unpredictability, and sustainability. It combines findings of primary surveys with secondary data provided by districts and states, such that the discussion will be based on both field and official data. It is argued centrally that potato growing in Hooghly continues to have economic importance and developmental potential, however, its sustainability in the long-term will relies on whether it is possible to make commercialization fairer, more resilient, and more ecologically balanced in favor of the farmers who make it possible.

Review of Literature:

A considerable literature has explored the aspects of potato and West Bengal that deal with the production, marketing, storage, technology, and sustainability. One of the first regional descriptions of potato in West Bengal was made by Choudhari (1957) and the suitability of the crop agro-climatically and in terms of economics was highlighted. In a study of the national level, Pandey and Sarkar (2005) suggested that potato emerged as a strategic crop in the new millennium due to its ability to score on food-security relevance and commercial prospects, but also cautioned that sustainability, environmental pressure, institutional support and market governance would be more frequently relevant. The structural weakness of the potato economy producers has continually been pointed out in marketing studies. According to research conducted by Pandit et al. (2003) prices fluctuation, storage, transport and middleman factors were found to be key obstacles in marketing of potatoes in India. Coming down to Hooghly district, Singh et al. (2005) conceptualized the marketing outlets and splour of price and revealed that the producer returns were undermined by the intermediary-controlled marketing structures. Subsequent studies of price-behaviour also observed obvious seasonality of the prices of Hooghly potatoes, whereby prices tend to be lower during the period between January and April and increases later on in the year, underscoring the fact that farmers are at systematic disadvantage in sales during the period of harvest time (Mithiya et al., 2019). The other area of significant scholarship is related to productivity, spatial variance, and the instability of the district level. Roy et al. (2019) demonstrated that the change in potato cultivation in Hugli district has been oscillating by area, output, and yield over time, indicating that the change in the sector has not been linear with time with a uniformly stable output. They also highlighted in their work the unfairness of block-level productivity and the significance of local infrastructural and environmental circumstances. More recently, applying SWOT-AHP analysis, Yasmin (2023) reported the demand at a steady year-round as one of the key strengths of potato growing in Hugli, and increasing expenditure cost and fluctuating profitability as threatened weaknesses. The geographical advantage plus the practical question of sustainable future is particularly

valued based on this line of research. Another body of research has examined the post-harvest management and cold storage. Panigrahy et al. (2000) acknowledged the significance of scientifically placed cold storage facilities to horticultural economies, whereas Kumar et al. (2004) examined the losses of products after their harvest and attracted the interest of unavoidable losses in the area of handling, storage and distribution. Cold storage in potato areas like Hooghly is not a marginal activity but a core determinant of when the market can be met, how the market will be realized and on what terms. Recent scholarship has also been increasingly concerned with environmental issues. Shaw and Topno (2022b) reported the large-scale application of fertilisers and pesticides in the growing and cultivation of potato in Hooghly and that people were highly aware of the reduction in soil fertility, the pesticide resistance, which necessitated the variables of crop rotation, bio-fertilisers, and using herbal pesticides. They find that the cultivation of potatoes in Hooghly needs to be examined not only in terms of profitability and productivity but also in terms of ecological cost and even the consequences of poor health on people. The literature thus makes four general points. First, potato is a commercially important crop, which has great livelihood implications. Second, marketing and price instability are still focal issues. Third, regional advantage is determined by the local infrastructure, i.e. irrigation and cold storage. Fourth, sustainability issues have become beyond the economics of cultivation. Nonetheless, these dimensions are still much divided in the literature. The current research fills this gap by considering the Hooghly potato economy as an interdependent socio-economic system where landholding pattern, irrigation, storage, price behaviour, household vulnerability and ecological strain constantly interact.

Objectives of the Study

The study has four objectives:
(1) to investigate the structural significance of the potato farming in the Hooghly district in larger contexts of India and the West Bengal;
(2) to examine socio-economic profile and production practice of a group of potato growers in the study area;
(3) to analyze the influence of market volatility, access to storage, and dependence on inputs in determining smallholder vulnerability;
(4) to assess the policy paths and sustainability issues that need to be made to ensure that the potato economy is more equitable and resilient.

Study Area and Methodological Framework

Hooghly district is located in the eastern region of West Bengal and it holds a significant space in the agrarian economy of the state. Major parts of the district are typified by fertile alluvial soils, relatively, high populousness and strong rural- urban connections. Its closeness to Kolkata and the bigger metropolitan market have already been supportive of the growth of commercial crops, and the development of irrigation and cold-storing facilities has helped increase the viability of the potato-growing business. The district block-wise data indicates that potato is not just in a single pocket but it is distributed in a cluster of cultivated blocks like Dhaniakhali, Pandua, Tarakeswar, Haripal, Polba-Dadpur, Goghat-II, Arambagh and Pursurah.

In terms of methodology, both secondary and primary data are used in the article. There is its primary evidence in a field survey of 200 potato growers carried out in various blocks of Hooghly district, that is, in Pandua, Balagarh, Dhaniakhali, Singur, Haripal, Tarakeswar,

Jangipara, Chanditala, Pursurah, Khanakul-I, and Goghat-II. The general investigation employed interviewing schedules, on-field conversations, and statistical description to learn the actual landholding, family structure, science orientation, dependence on irrigation, source of seed, and marketing limitations.

Secondary sources were identified as Agricultural Statistics at a Glance 2024-25 published by the Government of India, the District Statistical Handbook: Hooghly (2018), the Project Implementation Plan of WBADMIP Phase-II (2024), and other academic research on the topics of productivity, marketing, prices, pesticide use, and sustainability. The integration of both primary and secondary evidence enables the transit of the household conduct to a broader district and state level interpretation.

It should be said that the last nationally comparable statistics on potatoes are released on India and state level, but the most available consolidated district handbook series in Hooghly reports on crop, block, irrigation and storage data through 2017-18. Instead of considering it a weakness, the study relies upon the district series to examine structural trends and volatility and the most recent national and state-level statistics to place Hooghly in the modern potato economy.

Results and Discussion

In the empirical discussion, which follows, there should be a transition towards larger scale as to local scale. The initial stage positions West Bengal into the current Indian potato economy, the subsequent stage components study the trends in Hooghly in the district level and at block level, and finally the correlation of these structural patterns to survey-based information on cultivators' vulnerability, market behavior and environmental stress.

1. Potato in India and West Bengal: Contemporary Statistical Context

Table 1 with official data proves two important facts. To start with, potato is still a nationally important crop in India, with production continuing to be over 57 million tonnes in both 2023-24 and 2024-25 (third advance estimate). Second, West Bengal is again one of the two major potato producing regions in the country besides Uttar Pradesh. West Bengal was estimated at approximately 515 thousand hectares under potato and approximately 13.76 million tonnes of production estimated in 2024-25 with the average yield of 26,724 kg per hectare. These are not mere statistical indicators; they are signs that the agrarian and market economy of the state is still relying on potato as a commodity. However, the power of the whole at the level of the state cannot be confused with homogeneous welfare among farmers. The state planning documents underlining the agricultural significance of West Bengal also highlight that an approximate of 96 percent are small and marginal farm households and that the average area of operation is approximately 0.77 hectare and annual household income reliant on agriculture (DWRID, 2024). The agrarian structure of the broader agrarian is essential to the potato economy. It implies that despite the commercial dynamism of the crop concerned, most growers are on small parcels, restricted in the amount of risk they can take and in the space that they can absorb- production or price spikes. Potato is therefore a parody crop; a very profitable crop during good seasons, but a very stressful crop during hikes in costs or plummets in selling price.

Table 1.

Potato area, production, and yield in India and West Bengal, 2023-24 and 2024-25

Region	2023-24 Area ('000 ha)	2023-24 Production ('000 t)	2023-24 Yield (kg/ha)	2024-25 Area ('000 ha)	2024-25 Production ('000 t)	2024-25 Yield (kg/ha)
India	2322.23	57053.34	24568	2359.32	58108.00	24629
West Bengal	489.00	13000.00	26585	515.00	13763.08	26724
West Bengal share in India (2024-25)	-	-	-	22%	24%	-

Source: Department of Agriculture & Farmers Welfare, Agricultural Statistics at a Glance 2024-25. 2024-25 figures are third advance estimates.

2. Hooghly District: Trend in Potato Area, Output, Yield, and Cold Storage

Table 2 presents the official data on potato growth and cultivation by district to reflect the structural significance and instability of this industry in Hooghly. Potato-hectares did not drop below 99 thousand hectares during 2013-14 to 2017-18 and even exceeded 111 thousand hectares in 2015-16. The production had shifted to 2.078 million tonnes in 2013-14 to 3.629 million tonnes in 2017-18, but the most notable aspect of the series is volatility, rather than consistent growth. Yield was 32,414 kg per hectare in 2013-14, rose to 34,802 kg per hectare in 2014-15, collapsed to 12,662 kg per hectare in 2015-16, and then recovered strongly to 36,594 kg per hectare in 2016-17 and 34,994 kg per hectare in 2017-18. The observed oscillating trend agrees with Roy et al. (2019), who characterized the productivity of the district in potato production as having extreme fluctuations over time.

It is also indicated in the same table that potato farming in Hooghly is highly inquisitively fitted with storage facilities. The number of cold storages increased from 136 in 2013-14 to 146 in 2016-17 and remained at that level in 2017-18. Cold-storage capacity grew to 2.052 million metric tonnes compared to 1.718 million metric tonnes at the same time and the reportedly benefited number of cultivators has also increased by 1,050,000 compared to 845,000. These numbers indicate that management after harvest is not a subsidiary activity within the Hooghly district; it is the backbone of the potato economy.

Meanwhile, the plenty of storage does not necessarily correspond to equity. Producers with greater access to capital have the ability to store and sell later into the season, and sell later in the season, unlike smaller farms which may sell produce right after harvest to settle loans or pay household bills or other fines. Cold storage is therefore in a draw, both a facilitating institution and a location of inequalities of time, liquidity and bargaining power, at the same time.

Table 2.
Potato trend and post-harvest infrastructure in Hooghly district

Year	Potato Area ('000 ha)	Potato Production ('000 t)	Yield (kg/ha)	Cold Storages (No.)	Cold Storage Capacity (MT)
2013-14	99.8	2077.5	32414	136	1718000
2014-15	100.7	3506.1	34802	142	1912000

Year	Potato Area ('000 ha)	Potato Production ('000 t)	Yield (kg/ha)	Cold Storages (No.)	Cold Storage Capacity (MT)
2015-16	111.6	1413.3	12662	140	1934000
2016-17	100.1	3664.1	36594	146	2052000
2017-18	103.9	3629.3	34994	146	2052000

Source: District Statistical Handbook: Hooghly (2018), Tables 5.2, 5.3, 5.3(b), and 5.7.

3. Selected Block-Level Pattern of Potato Cultivation and Irrigation, 2017-18

The data collected at the block level indicate that the potato farming activity is both an agglomerated and dispersed activity in Hooghly. Table 3 indicates that Goghat-II, Pandua, Polba-Dadpur, Dhaniakhali, Arambagh, Haripal and Tarakeswar are all blocks that registered significant area and production in 2017-18. Goghat-II covered around 9,621 hectares of potato aimed and achieved a potato production about 359,397 tonnes whereas Pandua got about 350,992 tonnes and Polba-Dadpur got about 353,545 tonnes. Three blocks of potato also became major like Dhaniakhali, Tarakeswar and Haripal. The fact that years in a number of these blocks have produced over 35,000 kg per hectare indicates that they are capable of producing, yet the irrigation records indicate that these performance levels are highly infrastructure focused.

As indicated in Table 3 column of irrigation, there are significant irrigated land blocks that have major potato blocks. There were 20,105 hectares of irrigation in Pandua, Arambagh 16,732 hectares, Dhaniakhali 15,559 hectares, and Polba-Dadpur 13,498 hectares. This highlights one of the key characteristics of the Hooghly potato economy, that potato is not growing well simply due to the quality of the soil or its accessibility to markets; rather it grows well in a locus where irrigation, the use of inputs, and connectivity to markets intersect. Practically, it also signifies that any impairment in the groundwater availability, energy price, and canal provision, or irrigation repairs can affect output and profitability directly.

These block-level patterns aid in understanding why cultivation of potatoes has turned into such an influential factor in the rural economy of the district. It is diffuse enough to define agrarian organization on a district level, but concentrated enough in a few belts in such a way as to generate extreme pressure on water, storage, labor, and market organization.

Table 3
Selected major potato-growing blocks in Hooghly district, 2017-18

Block	Potato Area (ha)	Potato Production (t)	Yield (kg/ha)	Total Irrigated Area (ha)
Pandua	9549	350992	36757	20105
Polba-Dadpur	9497	353545	37227	13498

Block	Potato Area (ha)	Potato Production (t)	Yield (kg/ha)	Total Irrigated Area (ha)
Dhaniakhali	9403	316997	33712	15559
Tarakeswar	8048	297157	36923	5324
Haripal	8148	286123	35116	11634
Goghat-II	9621	359397	37355	12122
Arambagh	9128	253720	27796	16732
Pursurah	6799	225836	33216	6545

Source: District Statistical Handbook: Hooghly (2018), Table 18.1 and Table 18.2.

4. Primary Survey Findings: Social Base and Production Practices

The main survey proves the statement that social foundation of potato production in Hooghly is predominantly smallholder in nature. Sixty-eight percent of the respondents who replied to the survey were of the marginal farmer type. That is an important discover, as it implies that the potato economy of the district is not controlled by big capitalist farms, but by small-scale cultivators with little land and but little ability to take risks. The survey has also determined that 58 percent of people who participated in the survey were part of large family units that may have either conflicting implication. Family labour will have, on the one hand, some cost reductions in cultivation; while on the other, household consumption requirement burdens the cash realization imperative of the harvest in quick-fix mode. The other interesting observation is that 72 percent of the respondents were mediocre adopters of scientific practices of potato cultivation. This is significant since it questions the naive belief that technologically passive farmers are vulnerable. Instead, the evidence indicates that a number of small and marginal producers realize that they are actively working to ensure that they can match the recommended practices. But adaptation is no guarantee of security. Financial exposure could be being added instead of being reduced by scientific adoption under the circumstances of fluctuating prices and high cost of inputs. Unequal capacity in the farming population is also evident in irrigation and use of seeds. Approximately, 83 percent of the farmers surveyed relied on shallow tube wells, and 17 to have relied on canal water. This trend suggests that the irrigation process is still based on groundwater when it comes to planting potatoes. It also concurred with the broader state-level issue of ground water dependence that raises the expense and produces long-term sustainability issues, (DWRID, 2024). The survey also revealed that over fifty percent of the participants used past stock seed implying seed-saving is prevalent among resource-constrained farmers. Although this can help to cut down short term cash expenses, it can also influence the quality of yield and susceptibility to diseases in comparison with scrutinized and scientifically handled seed.

Table 4

Selected indicators from the field survey of 200 potato farmers in Hooghly district

Indicator	Value	Interpretation
Sample size	200 farmers	Primary survey across selected potato-growing blocks of Hooghly district
Marginal farmers	70.5%	Potato cultivation is dominated by resource-poor smallholders
Large family units	58%	Household labour remains important, but consumption pressure is also high
Medium adopters of scientific cultivation	72%	Adoption exists, but does not remove market and cost vulnerability
Main irrigation source	83% shallow tube wells	Groundwater dependence is central to production
Canal irrigation users	17%	Surface-water support remains limited relative to tube wells
Seed source	More than half from previous stock	Saved seed remains common among resource-constrained farmers
Income pattern	Largest group below ₹60,000 annually from potato	Returns remain modest for many cultivators despite commercialization

Source: Primary field survey reported in the uploaded manuscript and related thesis-based analysis.

5. Environmental Stress and Emerging Sustainable Practices

Another problem is related to cultivation cost structure. One of the gravest forms of weaknesses according to Yasmin (2023) in the current potato economy of Hugli district is the rising expenditure. Field-level evidence supports this observation as does the larger trend in potato production of depending on the purchased seed, chemical fertilisers, pesticides, irrigation energy and hired labour. The net margins may be negative where gross returns are enticing as cost inflation tends to accelerate more than the prices.

The secondary statistics of the district also indicates increased chemical dependence. The total consumption of fertilisers in Hooghly has risen, with the consumption level reaching 107.80 thousand tonnes in 2013-14 increasing to 135.50 thousand tonnes in 2017-18. The potato aspect of this district-wide rise is not an isolated fact, but it is a significant context growth measure of a mainly agricultural intensive district where potato happens to be one of the most popular commercial crops. To be more specific, the survey conducted by Shaw and Topno (2022b) in Hooghly established that 65.6 percent of the people knew about decreasing soil fertility due to the use of chemicals, approximately 70 percent were convinced in the existence of pesticide resistance, and 2.7 percent of the sample of the study conducted regular soil analysis. These results point to an agriculture system in distress: farmers are aware of degradation, but still, institutional and technical help on the way to corrective actions is insufficient.

Simultaneously, the environmental narrative is not completely adverse. The same study found that respondent levels had started using bio-fertilizers/herbal pesticides (32.5 percent) and rotating crops (58.7 percent). These are key beginnings to a more sustainable future. They demonstrate that cultivators need not be naturally hostile to ecologically friendly practices, but instead require economically viable options, which reliable extension services and policy interventions can help to implement to a greater extent.

The potato economy of Hooghly can however not be seen as an issue of luxury as far as environmental sustainability is concerned. The productivity and livelihood security are directly influenced by soil health, pesticide management, water use, and disease control. Such an input-intensive commercial method that causes soil degradation and aggravates resistance issues will in the long run prevent even the profitability that it aims to uphold.

Table 5
Environmental indicators related to potato cultivation in Hooghly

Environmental indicator	Value	Implication
Total fertiliser consumption in Hooghly district	107.80 thousand tonnes (2013-14) to 135.50 thousand tonnes (2017-18)	Indicates rising chemical intensity in an already input-heavy agrarian system
Farmers aware of soil fertility decline	65.6%	Cultivators recognise long-term ecological stress
Farmers undertaking regular soil testing	2.7%	Scientific corrective feedback remains extremely weak
Farmers reporting pesticide resistance	About 70%	Increasing disease-control cost and chemical dependence
Use of bio-fertilisers / herbal pesticides	32.5%	Sign of emerging ecological adaptation
Practice of crop rotation	58.7%	Important basis for more sustainable potato-based agriculture

Source: District Statistical Handbook: Hooghly (2018), Table 5.6; Shaw & Topno (2022b). Fertiliser data are district-wide and provide contextual evidence for an intensive agricultural system in which potato is a leading commercial crop

6. Market Volatility, Distress Sale, and Unequal Capture of Value

Market volatility has been one of the most decisive forces which determine the lived experience of potato growers in Hooghly. As demonstrated in the marketing literature, the prices of potatoes have always been very volatile, and that farmers are hardly the direct beneficiaries of high value at harvest time (Pandit et al., 2003; Singh et al., 2005). The time-series analysis by Mithiya et al. (2019) validates the fact that January to April the prices tend to be low in Hooghly district and start to increase after that. This annual phenomenon has economic implications since this is the season of harvest which is associated with the phase of most low prices when farmers are at the point of greatest price pressure to sell.

The repercussions impact small time and marginal farmers to an extent. Potation plants demand an outlay upon seed, labor, manure, pests, water, transportation, grading and in most instances storage. Upon receiving the harvest, farmers usually require urgent money to cover informal lending interest, input debt, cover storage fees, or household consumption. Due to this, a good portion of crop is being sold in distress. People that are more liquid, or those that have a superior network in commerce are able to store produce and wait till it can be sold later at a better price. Therefore, gains are not equally distributed in the market; they go to the individuals who are in control of time.

This structural imbalance describes how a district may be both a place of accumulation of aggregate production of potatoes and a place of apprehension at the cultivator level. The high production is not necessarily what leads to secure livelihoods. Instead, it can further strengthen reliance on volatile markets, particularly when institutional procuring, stabilization of prices, and farmer collectives are not strong. It is not that prices themselves fluctuate; it is just that the ability to withstand fluctuation is not evenly spread.

7. Why Small and Marginal Farmers Remain the Most Vulnerable

The small and marginal cultivator is the most vulnerable in this system. The evidence presented in this paper suggests four (and a potential fifth) relevant factors that lead to vulnerability, which combine at their intersection: small operational holdings; dependence on purchases for inputs; irrigation by groundwater; agriculturalists without adequate access to storage and credit equalization/storage and land tenure; exposure during seasons of price collapse. No single explanation accounts alone for rural distress. Rather, vulnerability is cumulative.

This is especially important for framing potato cultivation in a positive but realistic light. Potato should not be a symbol for crisis alone. Undoubtedly, it has created income opportunities, boosted local shops and supported economies of cold storage and transport, and reinforced Hooghly district's commercial agricultural character. But its rewards have been mediated through institutional inequality. The crop that offers income and opportunity also brings increased risk where public support, farmer organizing, and fair access to markets fall short. Policy action on multiple fronts is thus necessary for a sustainable and inclusive future for the district’s potato economy.

The primary requirement is institutional credit, in an adequate volume, timely and of reasonable cost to prevent the farmer from being locked into unremunerative sales due to a cycle of informal debt. The second is expanded extension support for seed quality, disease management, soil testing, and integrated nutrient and pest management. For the third, market organization that is fairer to farmers via producer collectives and farmer-producer organizations, transparent grading and sale practices, reliable market intelligence etc. The fourth is better crop-risk support, including insurance and emergency intervention in price crashes.

The fifth is ecological reinforcement through crop rotation, organic or semi-organic soil management and more rational use of water.

Such measures would curb-at least some of-the farmer distress; they would also help retain the strengths that made Hooghly a top potato district. In other words, sustainability is not an obstacle to productivity; it is the precondition for long-term productivity.

Conclusion:

Potato farming is now a symbolic element of the agrarian economy in Hooghly district. With its fertile land, irrigation support, transport linkages and cold-storage infrastructure, potato has emerged as a big commercial crop in the district bearing livelihoods impact at scale. The latest national and state statistics reaffirm the continued significance of potato in both India and West Bengal, whereas district-level data indicate that Hooghly has been able to retain a substantial area, output as well as storage capacity.

But the evidence also suggests that this success is uneven. Production and yield have been quite volatile, cultivation costs continue to be high, and market timing favours better-capitalized actors over normal cultivators. A field survey and supportive studies clarify that social anchoring of potato cultivation in Hooghly is through small and marginal farming. These farmers are not passive or indifferent to technology; many actively adopt scientific practices, and they manage to sustain the crop in difficult conditions.

But they're still exposed to irrigation dependence, costly inputs, distress sale and environmental degradation. The continued prevalence of poor soil-testing practices and widespread worries about declining fertility and pesticide resistance also show that economic sustainability and environmental sustainability go hand-in-hand.

So, the larger lesson of this study is balanced and constructive. Hooghly's potato economy is not a dying system; it is one that is always changing and you can always gain from it. But for that dynamism to remain socially just and ecologically sustainable, policy support should go beyond output expansion alone. Fairer marketing, better storage access for real growers, improved credit, effective extension services with humane inputs and farmer centric sustainability practices will shape a more secure future.

Fairer marketing, improved storage access for actual farmers, sustainable credit availability and extension services with living planet-based inputs will be the way forward to active food sovereignty of the people. Enforcing these norms makes potato cultivation in Hooghly not just a more lucrative crop, but also a livelihood option that can become firmer and nobler for those who grow it.

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