

# Agrifood Systems Policy Research

## HISTORICAL EVOLUTION OF AGRIFOOD SYSTEMS IN ODISHA, INDIA

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### ABOUT THIS RESEARCH NOTE

The diverse political influences and agrarian histories in Odisha have played a major role in determining the heterogeneous regional contexts of agricultural development in the region. Several important political-economic developments like land tenure systems, feudal and semi-feudal structures, and their alliance with colonial extraction of revenue and taxation regimes historically have determined the agrarian pathways manifested in present inequalities in access to land, resources, and capital. There is a historical path dependence in agrarian systems, agrarian relations and the policies that aim to bring about changes. Thus “solutions” to a sustainable and resilient agrifood system needs to be contextualized within the historical and socio-political context.

This research brief discusses the major drivers of food production and food security in Odisha charting the evolution of agrifood systems in the state. It traces the major political, economic, and social developments in Odisha that have taken place since 1850 that have determined the agrarian relations and agrifood outcomes for the region. It also discusses the major climatic events, particularly droughts and floods, that have influenced food production and livelihoods of rural communities. It brings out the temporal continuities and discontinuities in agrarian relations and technological transformations in agriculture.

### KEY STUDY FINDINGS

1. Odisha has consistently reported lower crop yields and input use in agriculture as compared to the national average since independence. The state has reported underutilization or non-utilization of land and agricultural labour, degradation and diversion of cultivable land, and stagnant crop and resource productivity. Despite several initiatives, including land and tenancy reforms, landlessness has remained pervasive.
2. Agriculture in the state is largely rainfed. Irrigation development has been sporadic, with no particular attention to groundwater irrigation even though evidence shows positive linkages between irrigation, agriculture, livelihood, and poverty.

3. The emphasis on paddy has been the characteristic of Odisha agriculture and rice remains the staple food from historic times. The dependence of farmers on rice is not due to its high net revenue, but due to its subsistence nature of production. The net profits from rice cultivation have been declining post-liberalization due to an increase in input prices without a corresponding rise in its productivity.
4. Exploitation of forest and mineral resources in the state has come at the cost of displacement of the local tribal communities. Poverty in the hilly and forested tracts of Odisha is due to poor quality of human capital, backward and unsustainable agriculture, and reckless exploitation of forest resources that has perpetuated poverty and malnutrition.
5. The structure of the credit market reveals acute and chronic indebtedness of the peasantry, especially among poor and marginal peasants who mostly borrow from informal sources. The formal credit agencies only provide loans to those who own land, benefiting only the upper landowning class. Low-caste households pay much higher mean interest rates and the average interest rates increase during drought years forcing poor farmers into a debt trap. Distress selling of landed property and assets is common at times of droughts and floods.
6. Tribal land alienation has historical roots. Though successive governments have launched welfare schemes for tribal populations in pockets of underdevelopment but have not done anything about clearing of land rights of the tribal people which remains the root cause of their poverty, starvation, and malnourishment. Among social groups, it is the scheduled castes and scheduled tribes who account for the bulk of the poor population. Thus, spatial, and social vulnerabilities reinforce each other.
7. Before 1947, the colonial nature of the land revenue administration entailed high revenues coupled with inappropriate land management practices that led to poor agricultural growth, low food production, and deterioration of the rural economy in Odisha. Post-independence academic discourse points to high exposure to natural hazards, and high societal vulnerability due to underdevelopment, poverty, and deprivation leading to food insecurity.
8. Rural society in Odisha seems to have been synonymous with widespread poverty and low purchasing power since colonial times. Overcrowding in agriculture happened in British Odisha with the closing of village salt and textile industries. However, even after economic liberalization in the 1990s, agriculture remains the livelihood of more than 70% of people in Odisha. Disguised employment is one of the causes of lower wage rates in the farm sector and lower purchasing power.
9. Lower investment in land in British times was associated with the apathy of the British administration and the profit motives of the absentee Bengali landlords. But at present, rich peasants in Odisha hardly invest 2% of their surplus in agriculture. Rack renting, usurious money lending, and speculative trade have been their principal methods of appropriation of agricultural surplus, which is largely spent on conspicuous consumption and luxury living.

## BACKGROUND

Odisha is among the poorest states of India where poverty is highly concentrated – both spatially and socially (de Haan and Dubey, 2005). Historically, food security has been the biggest challenge in Odisha. Major starvation deaths occurred in modern Odisha in 1866 during the great famine when Odisha was under British rule (Samal 2000; Das 1989). However, frequent incidences of starvation deaths were reported even in the post-independence period, particularly in the districts like Kalahandi, Balangir, Koraput, and Mayurbhanj (Ambagudia 2010)). Periodic events of cyclones, droughts, and floods have also been associated with food shortages, loss of crops, and lowering of purchasing power (Bahinipati 2014). It has impacted farm households' consumption patterns, especially with respect to either consuming less amounts of food or changing the food basket to less nutritious diets (Bahinipati & Venkatachalam 2015).

Though the state reported higher agricultural growth during the 1980s it was always below the national average (Patra 2014). Policy changes during the Economic liberalization of the 1990s also did not lead to any improvement in the agricultural sector and instead increased disguised unemployment in the farm sector (Pattanaik & Nayak 2014). Studies reveal a process of pauperization of agriculture' with farming becoming a high-risk and low-return activity with increasing input prices and bottlenecks in the marketing of agricultural products (Sahoo et al. 2020). Increasingly the small and marginal farmers are getting more

prone to agrarian distress (Haan & Dubey 2005).

Rice is the major food in rural and urban areas of Odisha. Most cultivators depend on subsistence agriculture and hence their diets mostly consist of home-grown agricultural commodities (Barik & Dash 2007)). Thus, the availability of adequate food is directly linked to the agricultural performance of the state. Poor agricultural performance in the state has been inevitably associated with poverty, lower purchasing power among the populace, and even higher incidence of underweight children in rural areas (Haan & Dubey 2005; Behera & Penthoi 2017). The most recent initiative to improve productivity and promote household-level consumption started in 2017 with the "Odisha millet mission". This is a novel initiative that aims to revive millet cultivation and consumption through a "farm to plates" approach that includes incorporating millets in nutrition programmes along with encouraging millet production with new agronomic practices, processing, and marketing.

Even with several interventions, Odisha has been caught up in a vicious cycle of low production and inefficient distribution. This is due to a combination of economic, social, ecological, and institutional factors that has historical roots that contribute to present issues of food security in the state. In other words, the current state of the agrifood system in Odisha is a function of pre-independence and post-independence policies and hence it needs nuanced reflection.

## OBJECTIVES

This research study aims to trace the major drivers of food production and food security in Odisha charting the evolution of agrifood systems in the state. The key questions of the study are:

1. What are major political, economic, and social developments in Odisha that have taken place since 1850 to recent times that have determined agrarian relations and outcomes for the country?
2. Have major climatic events in historical and current times (e.g droughts and floods) influenced the trajectory of evolution of food systems?
3. What are the temporal continuities and discontinuities in agrarian relations and outcomes between 1850 and presently prevailing contexts?
4. How have these evolving agricultural political-economies determined current drivers, production processes, consumption patterns, decision-making, and ecological factors of modern agrifood systems?
5. What political and structural barriers and opportunities do these historical developments provide for study and action towards transformations of present agrifood systems?

## DATA AND METHODS

This study is based on a review of published literature including historical studies, available colonial/royal archival documents (gazetteers, Commission reports, etc.), policy reviews, and post-independence policy and planning documents relevant to the agrifood sector. The major limitation of the study is that it leaves out a large body of literature that remains either unpublished or is published in Oriya. This study takes into consideration only material that is available originally in English or is translated into English from Oriya.

To bridge this gap to some extent, the understanding of the historical arguments and facts has been corroborated with interviews with key expert informants. Moreover, this review of historical, economic, and political events is further enriched by a stakeholder consultation held on 25th November 2022 (add a reference to the stakeholder workshop report) where experts from different regions and sectors in Odisha and with varied expertise further added nuance to the thematic and narrative scope of the study.

Finally, the report has taken an approach of interpretive historical inquiry method for analytical and thematic assessments of all historical events from agricultural policy decisions to climatic disasters that have shaped the current drivers of agrifood systems in modern Odisha.

## STUDY FINDINGS

The literature focusing on the issues of agricultural productivity and food security during the period before 1947 (pre-Independence period), focuses predominantly on the land revenue administration of the British government. They all draw the same conclusion that the “apathy” of British officials and Indian (Bengalis in particular) zamindars led to the economic drain of Odisha (Jit 1984; Bag 2007; Samal 2000). Excessive land revenue, notwithstanding the productive capacity of the land, and the simultaneous destruction of village cottage and salt industry gradually led to the deterioration of the agricultural economy of Odisha (Samal 2000). It does not elaborate much about the agricultural practices and patterns per se nor on the determinants and drivers thereof.

Contrary to the writings of Indian historians, British officers and European travelers paint a different picture of colonial Odisha. They emphasize the benevolent measures of the British Government and the political peace and stability that it brought to the region which was ruled by small kings and chieftains who were constantly fighting over land. They praise their system of land revenue as more scientific based on cadastral surveys and the generous investments in canal systems hitherto unknown to this region (Mishra 2001). Their narrations claim that British investment in infrastructure like canals saved the region from incessant flooding and insured it against drought. The development of ports, roads, and railways brought in more trade and prosperity. These scholars blame the “lack of enterprise” of the farming community of

Odisha which heavily depended on the “caste-exclusiveness” of the agrarian society. Moreover, “climatic disasters” resulted in starvation, food insecurity, poverty, and overall economic backwardness of the region (Mishra 2001, Moris 1968).

To counter this claim, De (1965) has pointed out that the fertile lands of Odisha never saw any famine like that of 1866 even during other foreign rules like that of the Marathas because land taxes were always adjusted to the productivity of a particular year. The canal infrastructure in Odisha had technological faults that neither took into consideration the hydrogeology of the deltaic plain nor the socio-economic condition of the people (D'Souza 2006). It seems that the canals were constructed as another measure to extract surplus without having any prior understanding of whether it would be able to generate any surplus of any kind. The indifference of the British administration is clear from their records of the famine commission where details are given on how delays were made in stopping rice exports, bringing in food relief, and even providing casual labor work in food-for-work programs (Mohanty 1993). The poor became poorer, malnourished, and died of starvation.

Two aspects continued to have a direct impact on the agrifood systems in British Odisha: a vicious cycle of low food production and low consumption given a large majority of the population in British-ruled Odisha depended on subsistence agriculture; and major climatic hazards that led to investments in certain types of infrastructures like canals and embankments.

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In this context, I would like to emphasize on two aspects that has direct impact on the agrifood systems and agricultural drivers of Odisha which in turn has direct bearing on food production and food security of people of Odisha. First, I will discuss the vicious cycle of low food production that has direct link to household food security in the regions considering a very large majority of population in British ruled Odisha depended on subsistence agriculture. Second, I will show how major climatic events have led to changing policy discourse in the state leading to financial investments for agricultural production and even overturn of administrative authorities making those policies.

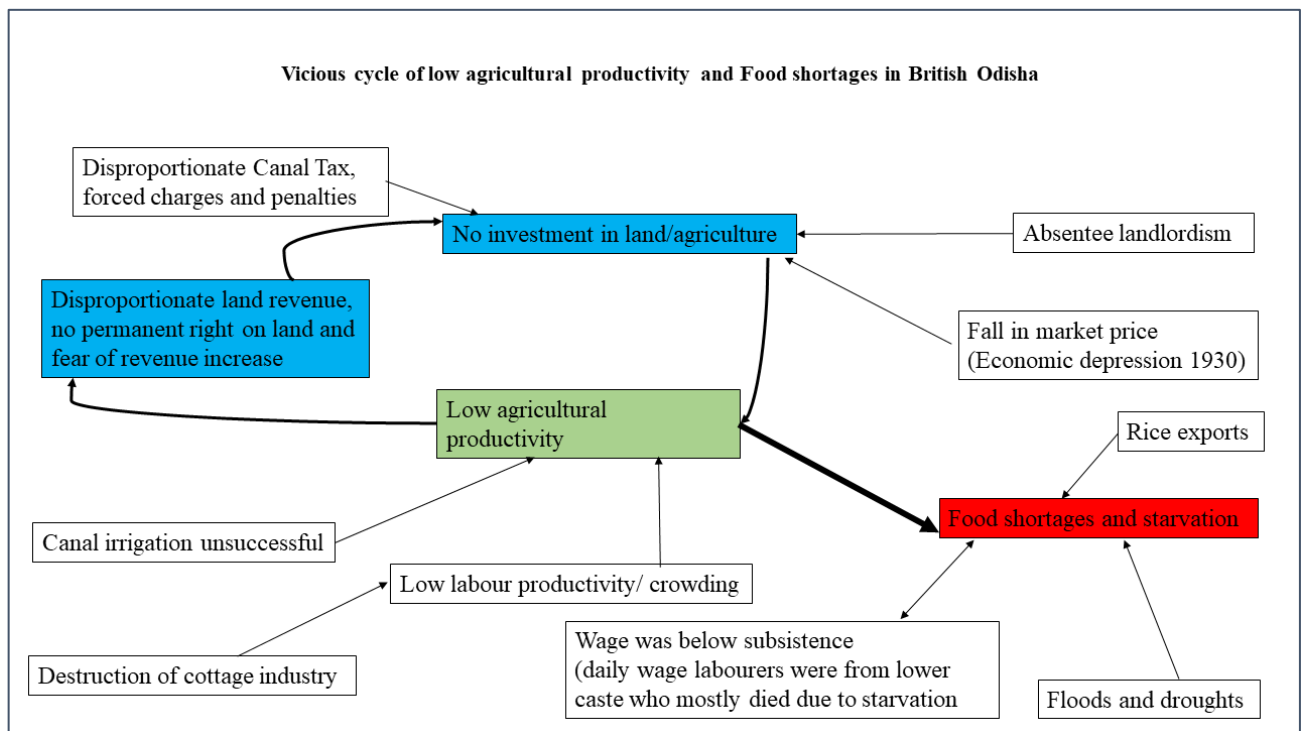
## A vicious cycle of low agricultural productivity and food shortages in British Odisha

In pre-independence times, the food systems were essentially local. Inevitably, there was a direct relationship between low agricultural productivity in the region to food shortages and starvation of its residents. There appeared to be a vicious cycle of low agricultural productivity in Odisha which is elaborated in the diagram below (Figure 1). Despite abundant stretches of fertile land and copious rainfall, Odisha remained trapped in a cycle of consistently low agricultural productivity, mostly due to a lack of investment in land improvement or technological changes both due to lack of money and lack of incentives for the landholders. The landlords were speculators who mostly lived out of Odisha without having any first-hand experience of people's suffering. Many Bengali landlords probably did not know about land fertility and its productive capacity in Odisha. They had simply

invested in huge tracts of land and had appointed middlemen to collect rent and make profits.

The actual tillers of the land who had much knowledge of the productive system and were directly affected by its low productivity had no means to invest in any input to increase productivity. The high land revenues (both land and canal taxes) would leave them with no savings to invest in the next crop and debt traps were usual. Moreover, canals on the deltaic plain had problems of excessive siltation, which led to more floods than the protection of embankments (D'Souza 2006). The economic depression of the 1930s led to a fall in rice prices and farmers could recoup much less revenue from rice sales than expected even during good harvests.

With the destruction of the local college industry and salt industry, all unemployed laborers took to agriculture as their livelihood. With overcrowding in agriculture, the monopoly of the landlords increased.



With no bargaining power, the agricultural wage rates remained perpetually low and a series of middlemen usurped the profits of even the good harvest. Rural society in Odisha came to be synonymous with widespread poverty and low purchasing power. The absolute food shortages were created both due to lower crop production as well a lack of purchasing power. To make matters worse, traders started hoarding rice and exported good quality rice to Burma and even to Europe through the ports (Bhaduri 1976).

### **Linking climatic events with policies on water control and food production**

Although there was a vicious system that perpetually kept the agrifood production system low in Odisha, the narrative of food shortages was always linked to climatic disasters – both floods and droughts. This point can be proved by the chronology of various climatic disasters in Odisha that forced the administration to take a stand to either increase investment to increase food production or to give relief to the farming community to improve their purchasing power (Table 1). The following examples illustrate how climatic hazards were propellers of new policies.

**1.** After the great flood in 1856, there were major deaths and crop losses in Odisha. Widespread dissatisfaction, deaths, and starvation under the administration of the East India Company were first-time acknowledged by Britain. This became a pretext to shift administration from the hands of the East India Company directly under the British crown within two years in 1858. Though a change in administration was a promise to change the exploitative rule, in reality, nothing much changed under the crown.

**2.** In 1865 there was a drought that led to massive crop loss. Middlemen had hoarded grains to sell at a higher price the next year. But in 1866, there was a severe flood that hampered the transfer of foodgrains to the starving population that led to the greatest famine in the modern history of Odisha reporting a death of 8% of the total population within the calendar year of 1866. This event shook the administration and paved the way for huge investment in canal infrastructure, the first of its kind in Odisha with an aim to increase crop yield with canal irrigation and protect agricultural plots from inundation due to heavy rains.

**3.** Odisha experienced another famine in 1897. By this time, the British government was very dissatisfied with the revenue collection in Odisha. The canals could not even recoup the capital cost and maintenance cost was on a rise. Unfortunately, due to the hierarchy of the land revenue payment system, the landlords got the benefits of increased productivity since rents were fixed after permanent settlement. The poor peasants were already under a relentless debt trap and were struggling to meet their ends. Although there is no scientific evidence to support that productivity had increased during that time, few records of the British offices mention the expansion of area under crops and good yields even during years of low rainfall. Antagonized with this notion of good yield and frustrated with not being able to recoup the investment cost, when zamindars wanted tax concession, the British initiated the second long-term land settlement to prepare fresh records of rights of the farmers and reassess and increase rent for increasing Government revenue.



**Table 1 - Timeline of important events that mark food production and food security under British Odisha**

Year	Major events
1803	Odisha was occupied by the British and was under East India Company
1837	The first Odisha settlement provided written leases ( <i>kali pottahs</i> ) to the resident village raiyats to protect them from rent enhancement or arbitrary eviction. There was a large class of non-resident cultivators who without this protection
1856	Great flood
1858	Odisha came under direct control of British crown
1865	Drought or insufficient rainfall
1866	Odisha famine due to drought
1876	Bengal Irrigation Act of 1876, This Act, as amended, remains the basic irrigation law for the States of Bihar, West Bengal and Odisha.
1866-1900	Odisha Canal Project that led to the construction of North Odisha Canal System
1885	Bengal Tenancy Act of 1885
1892-1901	Construction of Rushikulya canal system in South Odisha
1897	Famine due to flood and drought
1898	The initiation of second long-term land settlement to prepare fresh records of rights of the ryots and reassess and increase rent for increasing Government revenue,
1920	Major flood
1920	The Congress identified itself with the Utkal Union Conference for the creation of linguistic provinces
1924	A flood committee was formed by the government that proposed spending of 56000 rupees, but it was rejected
1927	Major Flood. Flood enquiry committee formed but all recommendations rejected citing reasons of paucity of funds
1 April 1936	Modern Odisha came into existence
1936	Odisha Tenancy Act
1937	Famine and formation of Irrigation committee
1937	Odisha Tenancy (Amendment) Bill passed to safeguard their rights and privileges of tenants
1937	Introduction of Agriculturist Loans Odisha Amendment Bill 1937 to enable government to lend money to agriculturist to pay off their prior debts
1937	Special irrigation Project was formed that worked to divert river water to fields to minimize flooding of rivers
1939	Moneylender's Bill to regulate money-lending business in Odisha
1946	Flood control and irrigation came under a special priority scheme, Starting of Mahanadi Valley project the dam was successful in controlling flood to a large extent

4. There was a major flood in 1920 that led to a loss of crops and a shortage of food. After the rent increase in the second long-term settlement, the dissatisfaction among the Oriya peasants increased. The local peasants were also resentful of their Bengali Landlords. By this time the Indian freedom struggle was also organized, and it was influencing the local politics of the regions. This became the basis for the Congress to be identified itself with the Utkal Union Conference demanding the creation of linguistic provinces speaking Oriya. The people of Odisha wanted to have a province of their own to take care of their interests that were being overshadowed by the people speaking the “dominant language” of the province.

5. The birth of Modern Odisha in 1936 was due to the complete dissatisfaction of the people of Odisha based on a narrative that “Odisha was constantly neglected and only used for generating revenue and surplus and only Oriya people in the Congress party can address to their growing needs”. This dissatisfaction and narrative came from the background of repeated rejection of the British government to invest in canals to protect Odisha's land from flooding on grounds of a paucity of funding.

6. As promised by the leaders of Modern Odisha, just after its bifurcation into a new province several measures like the formation famine and irrigation committee, amending of the Odisha tenancy bill to safeguard the rights and privileges of tenants, the introduction of agriculturist loans amendment bill to enable the government to lend money to agriculturist to pay off their prior debts and moneylender's bill to regulate

money-lending business in Odisha came into force. Even a special irrigation Project was formed that worked to divert river water to fields to minimize flooding of rivers. Even flood control and irrigation came under a special priority scheme, starting of Mahanadi Valley project in 1946 that later became successful in controlling floods to a large extent.

### **Drivers of agricultural productivity and food security after independence: 1947 to present**

The academic discourse on Odisha after independence has concentrated more on underdevelopment, poverty and backwardness of peasants, underdeveloped agriculture, and social deprivation of the less privileged sections of the society including access to health care and education. The current drivers of food production and distribution are summarized in the Figure 2.

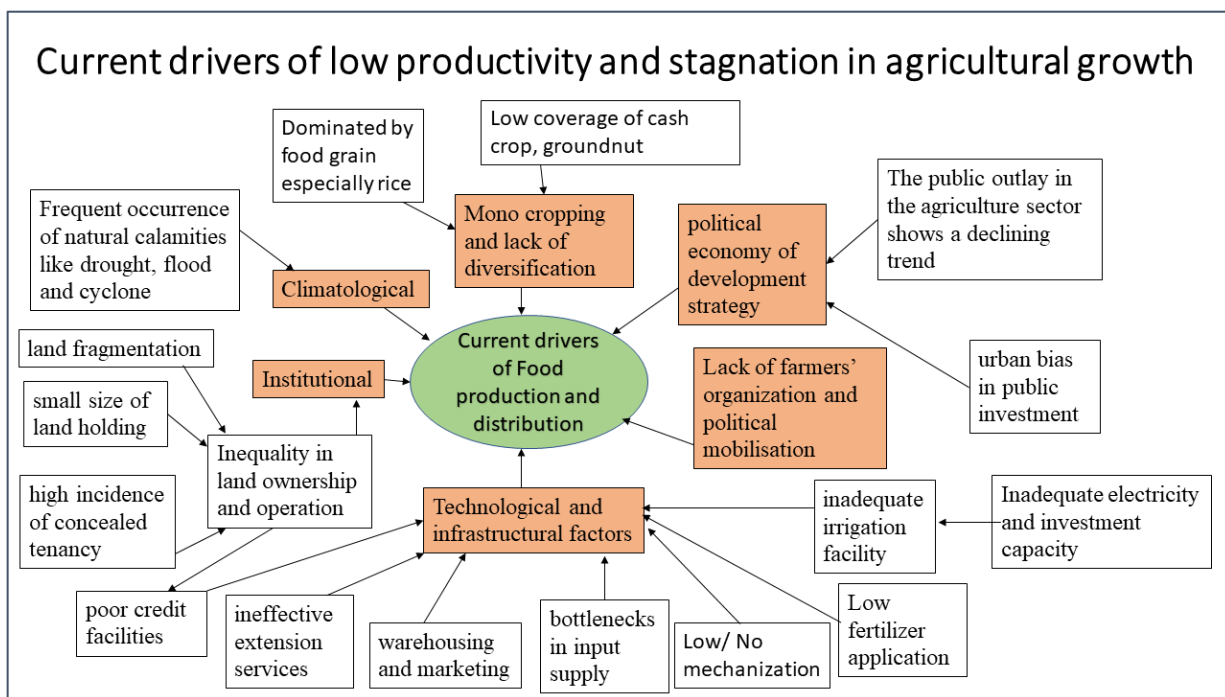
The first set of drivers is related to institutional factor and particularly to land and its distribution. The discourse on lower levels of agricultural productivity during the British administration revolved around high land rents and unequal distribution of land among cultivators. To correct this inequality in land ownership and increase investment in land, land and tenancy reforms were introduced in Odisha as the first major step after independence to increase food production and increase farm incomes of rural population. Unfortunately, these reforms did not bring any visible result. Still today Odisha's low agricultural productivity is associated with inequality in land ownership and exacerbated by small size of land holding, land fragmentation and high incidence of concealed tenancy.

In this context, agrarian scholars have noted that “Green Revolution seems to have simply bypassed the state” (Mishra 2015, pp. 3). These scholars equate Green Revolution to an era where intensity of application of modern inputs particularly HYV seeds, irrigation, and fertilizer increases. Odisha has never reported increase in application of inputs. On the contrary, low levels of agricultural productivity have been associated with low levels of fertilizer application, poor development of irrigation potential, lack of mechanization, low energization of irrigation pump sets and poor credit facilities. There are also bottlenecks in input supply like ineffective extension services warehousing and marketing (Pattanaik & Mohanty 2016).

Paddy is the principal crop of Odisha and also the staple food of its population. Monocropping of paddy with lack of diversification poses another challenge in the state. Paddy being a water intensive crop is much affected due to untimely and less rainfall. The state has been experimenting with drought resistant

rice varieties at a pilot scale (Swain et al. 2009). But there seems to be no effort to increase coverage under assured irrigation to mitigate such risks. Groundwater irrigation is prone to well failure in the hard rock topography and poor quality of electricity supply has dissuaded the farmers to invest in tube-wells in the fertile tracts (Srivastava et al. 2014). Most probably, lower yields and high input prices keep the net returns low, leaving no surplus for private investment in any land augmenting technology. Though recent trends have shown some degree of diversification specially towards maize and groundnuts, it is of negligible proportion (Nayak & Kumar 2019).

The other driver that indirectly affects agricultural growth is the political economy of development strategy in Odisha which shows a declining trend in public outlay in the agriculture sector and an urban bias in public investment. This is possible due to a lack of farmers’ organization and political mobilization.



Though there is evidence of few peasant movements, Odisha has never witnessed large-scale organization by peasants (Bag 2007). Many scholars also attribute this reason to the failure of land reforms in Odisha that were relatively more successful in neighboring West Bengal. In recent times Odisha became the pioneer in electricity reforms in the country during the 1990s when generation, transmission, and distribution activities of the Odisha State Electricity Board (OSEB) were unbundled and in 1999, power distribution was privatized in the state. Unlike other dominantly groundwater-irrigated states, where even the metering of pump sets is a challenge, the state brought about these changes without any farmers' protests.

### **SUMMING UP: CONTINUITY AMIDST CHANGE**

From the analysis of the historical trend and drivers of agrifood systems in Odisha since 1850 two important points can be stated. With respect to the popular discourse in published literature, it is seen that pre-independence literature emphasizes land revenue administration as the most important driver of agricultural growth and food production. Post-independence academic discourse concentrates on natural calamities, underdevelopment, poverty, underdeveloped agriculture, and social deprivation of the less privileged sections of society as reasons for food insecurity. However, in the last four decades, it seems that there is an overwhelming emphasis on climate change as the main driver of crop loss and agricultural backwardness of the state.

However, it will be interesting to read two excerpts about Odisha from two different periods describing the situation of food security and the condition of the agrarian society in their respective periods,

showing that not much has changed on the ground.

The first budget speech in the Assembly, in 1937, identified the reasons for agricultural distress under British rule as the recurrence of floods and famines, absentee landlordism, and rack-renting combined with the usurious rates of interest of the moneylenders. Bhatia (1963) writes "Such rack-renting and lease arrangements not only impoverished the farmers but also destroyed all the incentive for agricultural improvement and investments". "Moreover, absentee landlordism also led to the degradation of poor peasants to the status of agricultural labor class in the villages, who ultimately sold their land to the usurious moneylenders" (Jit 1984). In the present context, nothing seems to have changed. Barik & Dash (2007) write, " In Odisha, the rich peasants hardly invest 2% of their surplus in agriculture. Thus, rack renting usurious money lending, and speculative trade have been their principal methods of appropriation of agricultural surplus, which they largely spent on conspicuous consumption and luxury living. The availability of cheap labor in abundance due to non-availability of secondary employment resources, the acute and chronic indebtedness of peasantry, and accumulation of quick profit through trade, further strengthen their counterproductive roles".

To conclude thus we find that there is a clear historical path dependency in agrarian systems, agrarian relations, and even the policies that tries to bring about those changes. Thus, to bring about any positive change for sustainable and equitable production and distribution systems one needs to understand the underlying geographical, socioeconomic, and political systems from both historical as well as present contexts.

## REFERENCES

- Ambagudia, J. (2010). Tribal rights, dispossession and the state in Odisha. *Economic and Political Weekly*, 60-67.
- Bhatia, B. M. (1963). *Famines in India: A Study in Some Aspects of the Economic History of India, 1860-1945*, Bombay: Asia Publishing House.
- Nayak, C., & Kumar, C. R. (2019). Crop diversification in Odisha: an analysis based on panel data. *Agricultural Economics Research Review*, 32(347-2019-3215), 67-80.
- Srivastava, S. K., Srivastava, R. C., Sethi, R. R., Kumar, A., & Nayak, A. K. (2014). Accelerating Groundwater and Energy Use for Agricultural Growth in Odisha: Technological and Policy Issues. *Agricultural Economics Research Review*, 27(2), 259-270.
- Swain, M., Swain, M. and Das, D.K. (2009) Regional disparity in agricultural development in Odisha in the pre and post-reform periods. *Social Change*, 39(2): 195-215.
- Pattanaik, F., & Mohanty, S. (2016). Growth performance of major crop groups in Odisha agriculture: A spatiotemporal analysis. *Agricultural Economics Research Review*, 29(347-2016-17247), 239-251.
- Bag, S. K. (2007). Agrarian Problem, Peasants And National Movement In Odisha. In *Proceedings of the Indian History Congress* (Vol. 68, pp. 944-964). Indian History Congress.
- Bahinipati, C. S. (2014). Assessment of vulnerability to cyclones and floods in Odisha, India: a district-level analysis. *Current Science*, 1997-2007.
- Bahinipati, C. S., & Venkatachalam, L. (2015). What drives farmers to adopt farm-level adaptation practices to climate extremes: Empirical evidence from Odisha, India. *International Journal of Disaster Risk Reduction*, 14, 347-356.
- Barik, B. C., & Dash, A. (2007). Agrarian Economy of Odisha and Poverty: Reflexive Observation. *The International Journal of Sociology of Agriculture and Food*, 15(1), 65-75.
- Behera, S., & Penthoi, G. C. (2017). Food insecurity and government intervention for sustainable food access in Odisha. *International Journal of Latest Technology in Engineering, Management & Applied Science (IJLTEMAS)*, VI, 38-46.
- Jit, N. K. (1984). *The Agrarian Life and Economy of Orissa: A Survey 1833-1897*, Calcutta: Punthi Pustak.
- Bhaduri, A. (1976). The evolution of land relations in eastern India under British rule. *The Indian Economic & Social History Review*, 13(1), 45-53.
- Das, P. C. (1989). *The Economic History of Odisha in the 19th Century*, New Delhi: Commonwealth Publishers.
- Haan, A. D., & Dubey, A. (2005). Odisha: Poverty, disparities, development of the underdevelopment? *Economic & Political Weekly*, 40(28), 2321-2329.
- Patra, R. (2014). Agricultural development in Odisha: are the disparities growing? *International Journal of Food and Agricultural Economics (IJFAEC)*, 2(1128-2016-92052), 129-144.
- Pattanaik, F., & Nayak, N. C. (2014). Agricultural Growth in Odisha During 1970-2012: An Analysis. *IUP Journal of Applied Economics*, 13(1).
- Sahoo, P., Sahoo, D., & Chandra, S. (2020). Changes in rural poverty among occupational groups in Odisha: an analysis of post-reform period. *Journal of Land and Rural Studies*, 8(2), 150-165.
- Samal, J. K. (2000). *Economy of Colonial Odisha, 1866-1947*, New Delhi: Munshiram Manoharlal.
- Mishra, D. K. (2015). *Production and exchange relations in rain-fed agriculture: The case of rice in Odisha* (No. 12). RGTW working paper.
- Mishra, P. K. (2001). *Historians and Historiography in Orissa*, Delhi: Indian Publishers and Distributors,
- Mohanty, B. (1993). Orissa Famine of 1866: Demographic and economic consequences. *Economic and political weekly*, 28(1,2), 55-66.
- D'Souza, R. (2006). *Drowned and dammed: colonial capitalism and flood control in Eastern India* (p. 107). New Delhi: Oxford University Press.



## ABOUT TAFSSA

TAFSSA is a CGIAR regional integrated initiative to support actions that improve equitable access to sustainable healthy diets, improve farmers' livelihoods and resilience, and conserve land, air, and water resources in South Asia.

## ABOUT CGIAR

CGIAR is a global research partnership for a food secure future. Visit <https://www.cgiar.org/research/cgiar-portfolio> to learn more about the initiatives in the CGIAR research portfolio

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