IFPRI SOUTH ASIA

CGIAR INITIATIVE ON National Policies and Strategies

SOUTH ASIA POLICY PERSPECTIVES #01 AUGUST 2024

Cluster-Based Development:

Lessons from country experiences for Odisha, India

Ben Belton, Clemens Breisinger, Yumna Kassim, Barun Deb Pal, Sudha Narayanan, and Xiaobo Zhang

Cluster-based development and rural economic transformation

Clusters are spatial aggregations of small businesses producing the same or related goods or services. Together, these businesses have the potential to contribute to economic development of rural areas by compounding the existing strengths of local producing communities. Cluster-based development has been successful where governments facilitate infrastructure and provide services to support existing clusters, often leading to spillover and expansion of these clusters to wider areas over time (Abdelaziz et al. 2021).

Agrifood cluster development can occur via two broad mechanisms: (1) *immanent development*, where clusters of commercial farms as well as firms in the value chain that provide goods and services required by farms (for example, specialized production inputs, machinery, and transport), emerge spontaneously in co-located groups; and (2) *organized development*, where actors such as government, companies, or nongovernmental organizations (NGOs) organize producers into groups to deliver extension services, inputs, or credit or to upgrade production practices, facilitate collective action to improve terms of market access, or enable compliance with standards or forms of branding such as geographic indications.

The *immanent development* of clusters comprising commercially oriented small and medium farms and supporting small and medium enterprises (SMEs) is a common pattern throughout Asia and some parts of Africa, particularly for higher value agricultural products such as farmed fish, poultry, and horticulture. These clusters usually form in places with suitable environmental conditions, geography, and infrastructure, such as access to water, reliable electricity supplies, and good transport links to cities that are major markets for high-value agricultural produce and the source of key inputs such as feeds, medicines, or ice. Typically, new clusters are initiated by small numbers of relatively well-resourced farmers or investors who start the development of a new value chain. Once these pioneering operations are established and have proven profitable, nearby farmers who have observed their success often begin to replicate the model. As the supply of product and demand for inputs from these farms grow, new firms (such as harvesting teams, traders, and transport rental businesses) emerge to provide these goods

and services and specialized inputs (such as nurseries, feeds, agrochemicals, farm machinery, veterinary services, and equipment rentals). As clusters grow, the risks of market entry for new producers and the transaction costs associated with obtaining inputs and selling produce decline. Economies of agglomeration occur due to knowledge spillovers, reduced search and transport costs resulting from the local availability of specialized goods and services, and because specialization and horizontal integration among businesses increase the efficiency and productivity of operations.

Organized development of clusters is based on interventions that foster the establishment of new clusters of economic activity, such as through the creation of special economic zones with preferential policies and infrastructure provision. Most often, such interventions work on a smaller scale by organizing existing farmers or firms into groups to enhance service delivery, create economies of scale, increase bargaining power, and brand products. There are numerous models of cluster-based intervention reflecting a range of objectives. These include co-operatives, group-based certification, and rural development programs such as Japan's One Village One Product (OVOP) and Thailand's One Tambon One Product (OTOP) schemes.

Challenges of cluster-based development

Despite the numerous advantages of agricultural clusters, their development often faces many emerging bottlenecks.

A common challenge is that once nearby farmers observe profitable opportunities created by successful entrepreneurs, many tend to follow suit and enter the business. Large numbers of new entrants mean more intense competition and lower prices. There are two ways to address the challenge of low prices. One is to lower the external costs facing the enterprises in the cluster, such as by expanding access to the outside market. The other option is process or product upgrading and differentiation, such as promotions for regional brands rather than individual marketing.

Another common challenge is the high level of specialization of clusters, often in a single product. In the case of crop and livestock clusters, there is an increasing risk of disease associated with the concentration of agricultural production in one location. To manage associated risks, the government can support interventions such as early warning systems, disease inspections, quarantine centers, the provision of toxin-free seedlings, and other services.

Other challenges associated with organized cluster formation include the elite capture of resources, such as where cluster leaders are locally influential people with the power to appropriate resources for direct personal gain or direct them to their clients along political or other patronage lines. In addition, the existence of deeply entrenched local institutions that conflict with cluster goals and prove difficult to disrupt, such as relationships between traders and farmers based on resource provision, can hamper cluster development.

Importantly, challenges faced by agricultural clusters are often context and location specific. When planning to support cluster-based development, it is important to diagnose the bottlenecks and identify solutions. Many of these are indigenous and context specific, and thereby difficult for outsiders to identify. Local elites can play a more effective role than outsiders and upper-level government, given their informational advantage. In many cases, it is beyond an individual enterprise's capacity to tackle the challenges. Collective actions are called for instead.

Overview of Odisha's agrifood system

Odisha has a gross cropped area of about 4.5 million hectares and 85 percent of the population is rural (Deb Pal et al., forthcoming). In 2017–2018, Odisha contributed 3 percent to India's gross value added (GVA) in both agriculture and manufacturing, with mining contributing 9 percent. Per capita GDP in 2018 was about US$1,402, compared with India's overall per capita GDP of about US$1,974 for the same year. Employment in agriculture dropped from 62 percent in 2004/05 to 44 percent in 2018/19, consistent with a parallel drop from 56 percent to 42 percent in the rest of India for the same years. Odisha's agricultural GVA increased by 3.1 percent in the 15 years between 2004/05 and 2019/20, including a 4 percent increase in the crop subsector, 5 percent in livestock, 3 percent in forestry, and 8 percent in fisheries. In 2017/18, primary agriculture accounted for 78 percent of Odisha's agrifood system, while processing and input supply each accounted for 3 percent, and trade accounted for 15 percent.

Table 1 Structure of agrifood system in Odisha and rest of India

	Share of value chain (%) in total agrifood gross value added (GVA)		Share of off-farm activities (%) in the GVA of individual value chains	
Agrifood value chain	Odisha	Rest of India	Odisha	Rest of India
Agrifood GVA	100.0	100.0		
Cereals	14.1	13.4	12.1	33.8
Roots and tubers	1.0	1.3	16.6	28.3
Pulses	2.1	2.7	10.0	15.0
Oilseeds	0.9	4.3	17.0	40.9
Fruits and vegetables	28.9	13.9	19.9	30.2
Sugarcane	0.2	5.0	59.7	65.5
Fibers	1.3	10.8	27.2	85.3
Tea, coffee, and cocoa	0.1	1.3	94.4	69.8
Other cash crops	7.2	9.7	21.9	37.0
Livestock	16.2	23.2	24.3	29.7
Fisheries	15.3	6.9	41.7	45.8
Forestry	12.7	7.1	13.4	34.7
Other food	0.0	0.4	100.0	100.0

Source: Reproduced from Deb Pal et al. (forthcoming).

Economic and institutional reforms in Odisha target the improvement of per capita income and average standard of living. As Odisha's economy grows and urbanizes and its rural economy develops, it leads to changes in land-use patterns, market expansion and more nonfarm employment opportunities. However, the success of this economic transformation depends on effective strategy design, global lesson-sharing, and a contextual understanding of Odisha's agrifood system. Cluster-based development is one potential avenue for achieving the government's goals.

What are the lessons from other countries for Odisha?[1]

Cluster formation is a continuous process, encountering various binding constraints along the way, either on the supply side or the demand side, that are beyond the capacity of individual enterprises to address. Whether a cluster can grow and develop depends crucially on whether the bottlenecks can be resolved. Because the bottlenecks are context- and time-specific, it would be impossible for a planner or outsider to prescribe a one-size-fits-all intervention to overcome all binding constraints. Instead, as mentioned earlier, local elites, such as business leaders and local officials, are better placed to identify emerging bottlenecks and locally appropriate solutions. In China, for example, because local governments have an embedded interest in promoting local economic development, they are keen to provide local public goods or initiate joint actions to address successive binding constraints and facilitate cluster development. In comparison, the role of the local government is more muted in some African countries (such as Egypt), limiting the growth potential of agricultural clusters.

It is important to align the incentives of local leaders with local economic development. However, it would be a daunting task to reform the incentive system of local officials in the short run. A more viable option is to encourage NGOs or business organizations, to play a more active role in initiating joint actions in countries lacking incentives for local officials.

Thailand's OTOP program provides a good example of a long-running, government-facilitated, cluster-based rural development scheme. Under this scheme, established in 2001 as part of decentralization efforts, each tambon (subdistrict, equivalent to a tehsil in Odisha) selects one superior local product to receive formal branding as a "starred OTOP product." These products include a wide range of foods (accounting for two-thirds of items), traditional handicrafts, and textiles. Community members receive assistance in improving the quality and marketing of their products through skills development and extension programs, product development assisted by universities, small business loan programs, support for digital marketing, and a national certification scheme that serves to promote the best quality products (Kurokawa 2009). The OTOP program's success lies in its coordination across multiple ministries, government departments, and state institutions, including banks and universities; and the linking of local initiatives to a larger scheme that offers local cluster members access to national and some international markets.

In Bangladesh, clusters of aquaculture farms, supporting businesses, and third-party logistics services have emerged spontaneously over the past 25 years as a form of unplanned development, in response to buoyant domestic consumer demand. The clustered form of value chain development has lowered transaction costs and stimulated uptake of new technologies and practices, thereby increasing farm productivity and efficiency and giving rise to a value chain that functions effectively and relatively equitably. The cluster-based growth of commercial aquaculture in Bangladesh has increased the supply of fish and significantly reduced real fish prices, making fish more accessible to lower-income consumers, thereby contributing to national food and nutrition security. Although not arising as a result of direct intervention, these aquaculture clusters have been enabled by public investments in market-enhancing infrastructure such as a dense rural road network, high levels of rural electrification, and the establishment of numerous public and private rural–urban wholesale markets.

[1] Based on findings from Zhang (2023).

These examples show some common challenges and opportunities for cluster-based development. Unleashing the power of cluster-based development will require more value-chain- and location-specific study.

ABOUT THE AUTHORS

Ben Belton is a research fellow, Development Strategies and Governance Unit (DSG), International Food Policy Research Institute (IFPRI). **Clemens Breisinger** is a senior research fellow, DSG, and program leader for the Kenya program, IFPRI. **Yumna Kassim** is a program manager, DSG, IFPRI. **Barun Deb Pal** is a research coordinator, Foresight and Policy Modeling Unit, IFPRI. **Sudha Narayanan** and **Xiaobo Zhang** are senior research fellows, DSG, IFPRI.

ACKNOWLEDGMENTS

This work is part of the CGIAR Research Initiative on National Policies and Strategies (NPS). CGIAR launched NPS with national and international partners to build policy coherence, respond to policy demands and crises, and integrate policy tools at national and subnational levels in countries in Africa, Asia, and Latin America. CGIAR centers participating in NPS are the Alliance of Bioversity International and the International Center for Tropical Agriculture (Alliance Bioversity-CIAT), International Food Policy Research Institute (IFPRI), International Livestock Research Institute (ILRI), International Water Management Institute (IWMI), International Potato Center (CIP), International Institute of Tropical Agriculture (IITA), and WorldFish.

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Funding for this work was provided by the CGIAR Trust Fund. This publication has been prepared as an output of CGIAR Research Initiative on National Policies and Strategies (NPS) and has not been independently peer reviewed. Any opinions expressed here belong to the author(s) and are not necessarily representative of or endorsed by IFPRI or CGIAR.

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IFPRI is a CGIAR Research Center

NASC Complex, Dev Prakash Shastri Road, Pusa, New Delhi 110012, India | T: +91-011-42244545 | F: +91-011-42244549
Email: IFPRI-NewDelhi@cgiar.org | https://southasia.ifpri.info