

## **Enhancing food security through Public Enterprise**

Mary C. Smith

London University, UK

marycsmithuk@gmail.com

### **Abstract**

Public enterprises contribute significantly to food security by investing in agricultural infrastructure, ensuring affordability and accessibility of food, and responding effectively to emergencies that may threaten the availability of food supplies. Their interventions play a vital role in safeguarding the well-being and stability of a nation's food system. However, evidence shows that due to problems of targeting the poor and due to endemic corruption in public enterprises, adequate amount of food is not reaching the poor. While the public distribution of food through public enterprises has avoided famines, malnutrition persists especially in small remote villages.

**KEYWORDS:** Food Security, public enterprise, public distribution

### **Introduction**

The prevalence of hunger in the modern world is a moral burden and a significant intellectual challenge to the development community and policy makers. Experience demonstrates that the availability of means of subsistence and increased earning potential do not inevitably result in the eradication of hunger or improvement of nutritional status. The majority of countries that have attained high standards of nutrition and health have done so by purposefully concentrating on food and nutrition interventions (Pettigrew et al., 2023). An effective system for supplying food grains to the impoverished in rural areas can prevent famine and lessen hunger in developing countries. Experience shows that food and nutrition interventions cannot be left to the private sector and public enterprises across the world are providing food to the poor at an affordable price.

Absence of public enterprise has led to tragedies in the past, the most studied of which is the anthropogenic Bengal famine of 1943 in British India resulting in three million deaths (Mallik, 2023). The 1943 crop yield was actually sufficient to feed the people of Bengal; the famine was

the result of an entitlement failure (Tauger, 2003). According to Nobel Laureate Amartya Sen (1981), the distribution of the food supply throughout Bengali society was hindered primarily by economic factors that affected the ability of certain groups of people to purchase food. The colonial government did not organise a Public Distribution System (PDS). The anxiety about shortages caused hoarding, speculation, and consequent price inflation that put even a basic subsistence diet beyond the means of most poor Bengalis. Today, famine is a rarity except in war ravaged countries and public enterprises across the world are providing food to the poor at an affordable price.

This article is an attempt to understand the policies and practices that determine the availability of subsidised food in rural areas and access to food by the vulnerable sections. It seeks to analyse the factors that lead to a situation in which starvation deaths are very rare, but hunger and malnutrition persist. It looks at the determinants of access to food - including geographical and household characteristics - in rural areas served by public enterprises.

### **The quest for food security**

Food security has been an important item on the agenda for both the academic community and development practitioners for a long time. Definitions of food security and its indicators have been proliferating for the last half century (Maxwell, 1996). According to some estimates approximately 200 definitions and 450 indicators of food security exist (Zoungrana, 2022). Many economists doubt whether it has a precise meaning at all (Timmer, 2015). The most commonly cited definition of food security is that of the Rome Declaration of the Food and Agriculture Organization (1996): “food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs for food preferences for an active and healthy life”. This definition is an ideal that no country can possibly achieve. For practical purposes, however, any definition that is intuitively plausible should suffice.

It has been argued that the set of food insecure is larger than the set of poor in developing countries (Wight et al., 2014). Therefore, any safety net targeting the latter would penalise those who are not poor but are food insecure. On the other hand, much of the empirical research shows that the aggregate estimates of poverty and food insecurity broadly tally even at regional levels (Díaz et al., 2002). Leaving out the non-poor leaves out only those sections of food insecure whose consumption patterns have changed by choice, necessitating nutrition education rather than income transfer (Suryanarayana & Silva, 2007). Even so, the changes in consumption pattern and whether they are due to distress or to the choice continues to be a matter of debate (Patnaik, 2007). Since

non-poor households also suffer from undernourishment, there are calls for a reassessment of the current policy of targeting the Public Distribution System PDS almost exclusively at poor households (Ray, 2007). The targeting often works against the policy objective of reaching the poor, as a significant proportion of the poor and food insecure suffer from severe malnutrition and calorific deprivation. Mane (2006) argues that the targeting has worked against the policy objective of reaching the poor, as a significant proportion of the poor and food insecure suffer from severe malnutrition and calorific deprivation. To avoid exclusion errors, a broad targeting or near-universal PDS is often recommended (Swaminathan, 2000). Kochar (2005) examined the case for targeting by assessing the responsiveness of caloric intake to the amount of the food grain subsidy. A low elasticity suggested that improvements in nutrition may require large subsidies and, hence, a targeted programme. However, she also found that targeting reduces the probability of participation by poor households, relative to a universal programme. As a substantial assault on poverty requires targeting scarce resources toward the poor, it is unlikely that targeting will be dispensed with. To avoid exclusion errors, a broad targeting or near-universal PDS is often recommended.

### **Public enterprise and PDS**

Public enterprise is a term that refers to the involvement of the state or public sector in the ownership, management, or provision of goods and services. Public enterprise can have various forms and objectives, such as ensuring public welfare, promoting social justice, regulating markets, or fostering economic development. Public enterprise can also play a role in ensuring food security, which is the condition in which all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life.

Food security is influenced by four main dimensions: availability, access, utilization, and stability (HLC, 2002). Public enterprise can contribute to improving food security at different levels and through different pathways, depending on the context and the needs of the population. Some examples of how public enterprise can support food security are:

- At the global level, public enterprise can facilitate international cooperation and coordination on food-related issues, such as trade, aid, research, and governance. For instance, the Food and Agriculture Organization (FAO) is a specialized agency of the United Nations that leads international efforts to defeat hunger, improve nutrition and food

security, and ensure sustainable agriculture. The FAO provides technical assistance, policy guidance, data and information, and emergency response to its member countries and partners.

- At the national level, public enterprise can implement policies and programs that enhance the resilience and sustainability of food systems. For example, public enterprises can invest in infrastructure, market regulation, social protection and food safety. Public enterprises play a significant role in ensuring food security within a nation. Through various mechanisms and initiatives, these entities contribute to stabilising food supplies, managing distribution networks, and addressing challenges in agricultural production. One key aspect is their ability to invest in and support agricultural infrastructure, such as storage facilities, and transportation networks. These investments help enhance productivity, reduce wastage, and ensure a more efficient supply chain from farms to consumers. Mainly, public enterprises are tasked with improving food security by providing subsidised food grains to low-income households through a network of fair price shops.
- At the local level, public enterprise can support small-scale farmers, cooperatives, and community-based organizations that are involved in food production, processing, marketing, and consumption. In Brazil public enterprises have improved food security by linking family farmers to institutional markets, such as schools and hospitals, through the Food Acquisition Program (Flexor et al., 2023). During times of crisis, such as natural disasters or global supply chain disruptions, public enterprises often play a crucial role in maintaining food reserves and implementing emergency measures to ensure continuous access to food supplies. These entities can swiftly mobilise resources and coordinate efforts to mitigate the impact of such crises on food security.

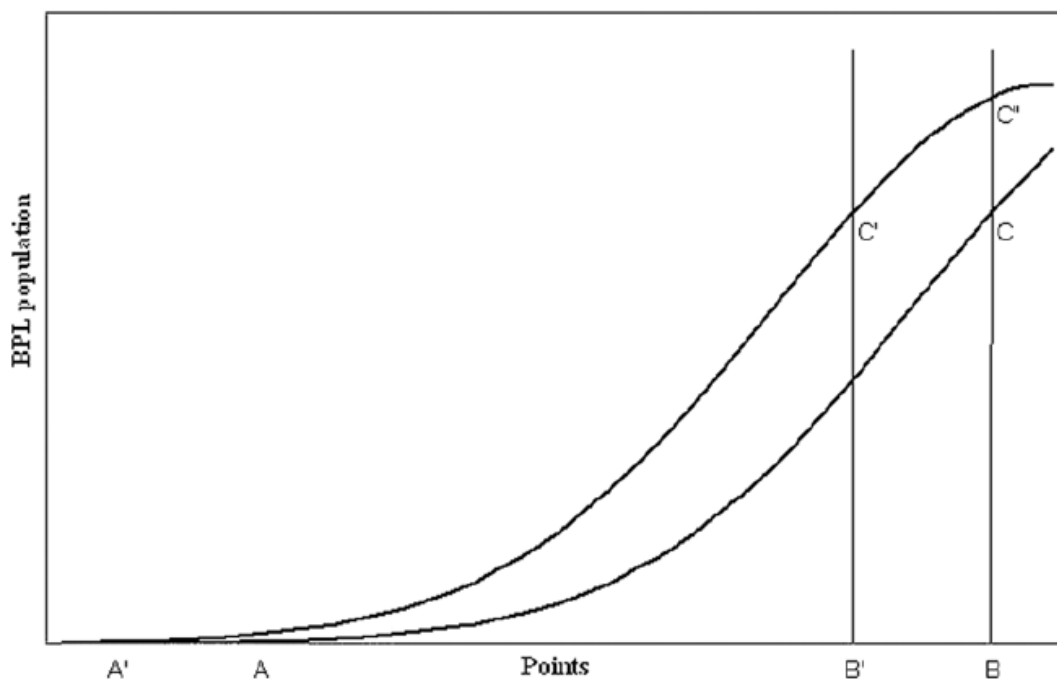
While public enterprises can be an important tool for improving food security at different levels and through different pathways, depending on the context and the needs of the populations, they may also face challenges and limitations, such as inefficiency, corruption, politicisation, or crowding out of private sector. Therefore, a public enterprise should be designed and implemented in a participatory, transparent, accountable, and evidence-based manner, and in coordination with other actors and sectors involved in food security.

## The problem of targeting

The identification of the poor is a contentious issue. The federal government, which bears nearly the whole of the burden of food subsidy, relies on the poverty figures based on calorific norms specified by a central agency for each region (Hirway, 2003). The data do not reveal the extent of poverty within regions (Sundaram, 2003). Household schedules are confidential to protect the anonymity of respondents, with a view to getting correct data. The regional governments are told the number of estimated poor in urban areas and rural areas separately, but disaggregated data are not made available. The federal government insists that it is up to the regional governments to decide which households are poor, but the number should be limited to that assessed by the central agency. These poor households are entitled to food grains at a subsidised rate. The delivery is the responsibility of the regional and local governments.

Whether a household is above or below the poverty line is adjudged through a proxy means test on the basis of points awarded, as per the household survey. As an illustration, Figure 1 gives the population below the poverty line against the points awarded to households. In this figure, the curve on the right gives the actual poverty distribution in a state, as per periodic national surveys. As per the instructions of the federal government, point B would be the cut-off point, if area ABC is approximately equal to the assessed number of poor households in the state.

Figure 1. BPL (below poverty line) population distribution



In the identification exercise carried out by the local government officials who live and work in the same district, a large number of households receive fewer points than they deserve. The distribution curve on the left in Figure 1 gives the distribution as per the survey. If the reduction in points was the same for all households, it would not matter at all because the cut-off point would shift from B to B' in such a way that  $\Delta ABC = \Delta A'B'C'$ . But some households would have been assessed correctly between B and B'; and to avoid exclusion errors, the regional government concerned would prefer to retain B as the cut-off point. Since the allocation of subsidised food grains from the federal government is based on  $\Delta ABC$  and not  $\Delta A'BC''$ , the beneficiaries identified by the regional or local government agencies will get less than prescribed amount of subsidised food grains, even if a perfect supply chain were to exist. This explains as to why distribution through public enterprises wards off famines, chronic malnutrition persists in poor countries.

### **The problem of corruption**

In the corruption perception index of Transparency International (2023), poor countries tend to do worse than rich ones, partly because poverty makes corruption worse and partly because corruption makes poverty worse (Vinayagathan & Ramesh, 2022). Considering that a lot of money goes into food subsidies in these countries, it is not surprising that public enterprises handling PDS are beset by corruption. From time to time, the mid-level officials of these agencies are prosecuted, either in specific cases or for owning assets beyond their known sources of income. This kind of corruption is a cause of concern for the tax payer but it does not directly affect the access to food of the poor. What affects the rural poor is the outright theft and subsequent sale of PDS articles on the open market and the diversion of food grains to those wrongly classified as poor. As a government doctor in a dispensary informed the surveyors:

When malnutrition cases come to us, we give them tablets; but we know that what these people need is food. Our superiors talk about vitamin, iron and iodine deficiencies, but the real problem is the lack of food. Even the poorest households can afford subsidised price of food; but for the last three months, no food grains have arrived at the ration shop. The person running the shop is getting rich.

When contacted, the person running the ration shop responded:

I have to take care of some people here [local politicians and officials]. I have to take care of people at the supply depot, otherwise no supplies would be forthcoming.

Some non-governmental organisations (NGOs) have organised public hearings, and the evidence reveals that politicians (elected and unelected) are on the take. It has been noted that ministers of the regional governments have taken over the role of personnel managers, and the transfer and postings of functionaries at all levels is within their power.

Two decades back, it was estimated that only a quarter of allocation reaches the intended beneficiaries, while the rest is eaten up by administrative costs, inadequate targeting and corruption (ORG, 2005; PEO, 2005). Recent emphasis is on the use of technology to achieve transparency. The allocations to the fair price shops are published on a website, and the movements of trucks carrying food grains for public distribution are monitored through the Geographical Positioning System. There are proposals for electronic ration cards. There are indications that these measures on reducing corruption.

### **Data and Methodology**

This study covers the rural areas of central-India. Rural areas as those which have a population smaller than 5,000, have a population density less than 1,000 per square mile and have at least 25 per cent of the population engaged in the agricultural profession.

A stratified two-stage random sampling method was used. The first-stage units (FSUs) were the villages. The second-stage units (SSUs) were the households. The sampling frame was the 2001 census list of villages, from which 150 villages were selected; probability was proportional to the population. The eight-digit census code was adopted as identification number for the FSUs. In respect of the FSUs, the following data were easily available from official records:

- population;
- distance from the nearest town;
- mid-day meal available in schools;
- the number of inspections made by government officials; and
- the number of meetings of the shop-level vigilance committee.

Having recorded the data for the FSUs and determined the units to be surveyed, attention turned to the selection of the SSUs. The investigators listed the houses using the order used in the census. Where such listings were not available, listings were started from the north-western corner of the settlement. Thereafter, from each FSU, 30 households were selected using a circular system with equal probability and a random start. A ten-digit SSU identification number was arrived at by adding the two-digit household number to the eight-digit FSU identification number.

Details were obtained for the 4,500 selected households. Data from the government survey were accessed. Household characteristics, such as the educational attainments of the head of the household, were also available in the official records. Through a simple questionnaire, points were calculated using the method adopted by the government surveyors, after making it clear to the respondents that this was purely an academic exercise.

After looking at the ration card and after a personal interview, the receipt of food grains from the shop was recorded. The average of the last six months as recalled by the household was taken as a reliable figure. The pattern that emerged from the inspection of data and preliminary analysis was as follows.

- While the shop is supposed to receive supplies every month, in some months no supply was received. This is not compensated for in subsequent months.
- The amount available for poor families depends on the supplies received by the shop, but is not the same for all households.
- Rations are not given on a first-come-first-served basis, or on any fixed criteria. Some households get less because the stock available is insufficient, and some households do not get any because the FPS has run out of stock

### **Variables**

In order to examine access to food by below poverty line (BPL) households, the dependent variable is a log of the availability of food grains in the household over a month. Since the monthly availability has been averaged over six months, there is no problem of zero observations. The independent variable education is the number of years of education of the head of the household. The test proposed by Bera and Jarque (1982) was used to confirm the validity of a general model requiring the estimates of the restricted model. MDW test (McKinnon et al., 1983) found that the natural logarithm of distance as compared to distance in kilometres would be better as an



explanatory variable. The test was used for other variables also and log of population was included as independent variable.

The senior officers of the public enterprise as also government officers of the regional government are expected to inspect the shops. Inspection is an independent variable indicating the number of inspections by administrative officials during the preceding quarter. ‘Vigilance’ attempts to capture the impact of local political pressure on service providers. For each shop, there is a vigilance committee chaired by the head of the village council of the area in which the shop is located. If the shop covers villages of a neighbouring council, the head of that village council is also included in the committee. Other members are unelected political appointees. Due to the lack of a consensus within the ruling party at the field level, many of the posts on the vigilance committees remain vacant and a large number of these committees are non-functional. Thus ‘Vigilance’ is a dummy variable taking the value of 1 if the committee is functioning and 0 if it is not.

### **Determinants of access**

Table 1 reports ordinary least square (OLS) regression results in respect of access to food by the BPL households. While education is not a significant variable, the independent variable measuring remoteness is significant at 1 per cent level. The independent variable representing the size of the village is significant at 5 per cent level. The variable indicating inspections is significant at 1 per cent level, while the dummy variable representing the vigilance committee is significant at 10 per cent level.

Table 1: Access to subsidised food grains by BPL households: OLS regression results

Dependent variable: log of availability of food grains in kilograms.

	Coefficient (Standard error)
Constant	2.177*** (0.598)
Log of distance	-0.083***(0.017)
Log of population	0.111**(0.0511)
Mid day meal	-0.002(0.007)
Education	0.003(0.007)
Inspections	0.112***(0.043)
Vigilance committees	0.142*(0.077)
Adjusted R square	0.57

To examine the robustness of the estimated model, several methods were tried:

- (i) altering the sample size by randomly excluding some households from the sample;
- (ii) regressing in linear and log-log functional forms by taking log of some variables and using others in the original form;
- (iii) replacing some of the independent variables by related variables, e.g., continuous variable 'education' by dummy variable 'literacy'; and
- (v) including additional independent variables, such as the income of the household.

However, none of the estimated alternative specifications change the observed empirical relationship between the indicator for the BPL household's access to food and the variables found significant in Table 1. Hence, these are not reported.

Given that the remoteness is anecdotally associated with supply chain problems and a lack of supervision, one would expect that, all else being equal, the longer the distance between the village and the nearest town, the greater the problem of access. The coefficient for the variable representing remoteness has the expected sign. It predicts that a 10 per cent increase in distance will be associated with a 0.8 per cent decrease in availability. The size of the village is no less important a determinant. The regression predicts that, controlling for other factors, accessibility to food in larger villages is better than that in smaller ones. An increase of 10 per cent in the size of the population will be associated with a 1.1 per cent increase in availability.

It is expected that each shop will be inspected by the officers of the public enterprise frequently as also by the government officers every two months. These inspections are irregular and often ineffective or collusive. Nevertheless, the coefficient of this variable was found to be positive and statistically significant. Further, a functioning vigilance committee also results in a significant increase in availability.

It was found that the population of the village is positively related to access to food, the distance from the nearest town is negatively related. Availability of mid-day-meals to the school children was not found to be a significant variable. Educational level of the head of the household was not found to be a significant variable. While education creates awareness, it does not seem to

directly affect the availability of subsidised food. On the other hand, inspections by the officers of the public enterprise and the government seem to have increased availability of food significantly. The analysis shows that the small remote villages are being inadequately served by public enterprises. To a large extent, control over inefficiency and corruption through administrative measures can address the problem of malnutrition.

## **Conclusion**

The nutritional levels of the rural populations in most developing countries are lower than that of the urban populations (Nabdi et al., 2022). The UN World Food Programme (2022) suggests that the volume of food produced is more than one and a half times what is needed to provide every person on earth with a nutritious diet. However, the interaction of the food sector with the institutional fabric of social relations determines access to an adequate supply of food to the poor. NGOs can play a role in improving food security in the countries where such organisations are active (Hyder & Husain, 1999). Public enterprises should not view NGOs' criticism of their working as interference. Instead, they should encourage NGOs in exposing inefficiency and corruption.

In a functioning democracy, it is often the case that different social groups lobby hard to get a larger share of the developmental pie. Poor people in small villages in remote areas are unable to make their voices heard. The warning issued by Jean Dreze and Amartya Sen (1989) is valid even after years of rapid economic growth in some developing countries:

Starvation deaths and extreme deprivation are newsworthy in a way that the quiet persistence of regular hunger and non-extreme deprivation are not. Endemic hunger may increase the morbidity rate and add to the mortality rate, but that is primarily a statistical picture rather than being immediately palpable and - no less importantly - being 'big' news.

The current policy of focusing on the most vulnerable population avoids deaths due to starvation. Careless targeting, a lack of supervision and corruption in the delivery system, however, mean that malnutrition will continue to haunt certain sections of the rural population. Public enterprises in the field of providing food security need reforms if their objective is to be broadened from avoiding famines to combating malnutrition.

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## References

- Bera, A. K. & Jarque, C. M. (1982). Model specifications tests: a simultaneous approach. *Journal of Econometrics*, 20(1), 59–92. [https://doi.org/10.1016/0304-4076\(82\)90103-8](https://doi.org/10.1016/0304-4076(82)90103-8)
- Díaz, H. L., Drumm, R. D., Ramirez-Johnson, J., & Oidjarv, H. (2002). Social capital, economic development and food security in Peru's mountain region. *International Social Work*, 45(4), 481-95. <https://doi.org/10.1177/00208728020450040601>
- Dreze, J. and Sen, Aa. (1989), *Hunger and Public Action*. New Delhi: Oxford University Press.
- Flexor, G., Kato, K. Y., & Leite, S. P. (2023). Agri-food globalization and food security in Brazil: recent trends and contradictions. *The Journal of Peasant Studies*, 50, 1-24. <https://doi.org/10.1080/03066150.2023.2259807>
- Food and Agriculture Organization (1996). *Rome Declaration on World Food Security*. Rome: FAO.
- Hirway, I. (2003). Identification of BPL households for poverty alleviation programmes. *Economic & Political Weekly*, 38(45), 4803-808. <https://doi.org/10.2307/4414254>
- HLC (High Level Committee on long term grain policy) (2002). *Report of the High Level Committee on Long Term Grain Policy*, New Delhi, India: Planning Commission.
- Hyder, S. M., & Husain, A. M. (1999). The role of NGOs to improve food security in Bangladesh. Dhaka, Bangladesh: BRAC.
- Kochar, A. (2005). Can targeted food programmes improve nutrition? An empirical analysis of India's public distribution system. *Economic Development and Cultural Change*, 54(1), 203-35. <https://doi.org/10.1086/431260>
- MacKinnon, J., White, H. & Davidson, R. (1983), Tests for model specification in the presence of alternative hypotheses: some further results. *Journal of Econometrics*, 21(1), 53-70. [https://doi.org/10.1016/0304-4076\(83\)90119-7](https://doi.org/10.1016/0304-4076(83)90119-7)

- Mallik, S. (2023). Colonial Biopolitics and the Great Bengal Famine of 1943. *GeoJournal*, 88(3), 3205-3221. <https://doi.org/10.1007/s10708-022-10803-4>
- Mane, R. P. (2006). Targeting the poor or poor targeting: a case for strengthening the public distribution system. *Journal of Asian and African Studies*, 41(4), 299-317. <https://doi.org/10.1177/002190960606065788>
- Maxwell, S. (1996). Food security: a post-modern perspective. *Food Policy*, 21(1), 155-70. [https://doi.org/10.1016/0306-9192\(95\)00074-7](https://doi.org/10.1016/0306-9192(95)00074-7)
- Nabdi, S., Boujraf, S., & Benzagmout, M. (2022). Evaluation of rural-urban patterns in dietary intake: A descriptive analytical study–Case series. *Annals of Medicine and Surgery*, 84, 104972. <https://doi.org/10.1016/j.amsu.2022.104972>
- ORG (ORG Centre for Social Research) (2005). *Evaluation of Targeted Public Distribution System*. New Delhi: ORG-MARG.
- Patnaik, U. (2007), *The Republic of Hunger*. London: Merlin Press.
- PEO (Programme Evaluation Organisation) (2005). *Performance Evaluation of Targeted Public Distribution System*. New Delhi: Planning Commission.
- Pettigrew, S., Booth, L., Dunford, E., Scapin, T., Webster, J., Wu, J., ... & Sacks, G. (2023). An examination of public support for 35 nutrition interventions across seven countries. *European Journal of Clinical Nutrition*, 77(2), 235-245. <https://doi.org/10.1038/s41430-022-01211-5>
- Ray, R. (2007). Changes in food consumption and the implications for food security and undernourishment. *Development and Change*, 38(2), 321-43. <https://doi.org/10.1111/j.1467-7660.2007.00414.x>
- Sen, A. *Poverty and Famines: An Essay on Entitlement and Deprivation*. Oxford, England: Oxford University Press.
- Sundaram, K. (2003). On identification of households below poverty line in BPL census. *Economic & Political Weekly*, 38(9), 896-901. <https://doi.org/10.2307/4413278>

- Suryanarayana, M. H. & Silva, D. (2007). Is targeting the poor a penalty on the food insecure? Poverty and food insecurity in India. *Journal of Human Development*, 8(1) 89-107. <https://doi.org/10.1080/14649880601101457>
- Swaminathan, M. (2000). Consumer food subsidies in India: proposals for reform. *Journal of Peasant Studies*, 27(3), 92-114. <https://doi.org/10.1080/03066150008438741>
- Tauger, M. B. (2003). Entitlement, shortage, and the 1943 Bengal famine: Another look. *Journal of Peasant Studies*, 31(1), 45–72. <https://doi.org/10.1080/0306615031000169125>
- Timmer, C. P. (2015). *Food security and scarcity: Why ending hunger is so hard*. Philadelphia PA: University of Pennsylvania Press.
- Transparency International. (2023). 2022 Corruption Perception Index. Berlin: Transparency International.
- Vinayagathan, T., & Ramesh, R. (2022). Corruption–poverty nexus: evidence from panel ARDL approach for SAARC countries. *Asian Journal of Comparative Politics*, 7(4), 707-726. <https://doi.org/10.1177/20578911211069496>
- Wight, V., Kaushal, N., Waldfogel, J., & Garfinkel, I. (2014). Understanding the link between poverty and food insecurity among children: does the definition of poverty matter?. *Journal of Children and Poverty*, 20(1), 1-20. <https://doi.org/10.1080/10796126.2014.891973>
- World Food Program (2022). 8 Facts to Know About Food Waste and Hunger. Washington, DC: UNWFP
- Zoungrana, A. (2022). Income diversification and food security: evidence from Burkina Faso. (MPRA Paper No. 112337). <https://mpa.ub.uni-muenchen.de/112337/>