

# **A Study of Food Security in Rural Assam: Are Food Based Welfare Programmes Doing Enough?**

A thesis submitted to Indian Institute of Technology Guwahati in partial fulfillment of the requirements for the degree of Doctor of Philosophy



Submitted by

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## Declaration

I hereby declare that the thesis entitled **A Study of Food Security in Rural Assam: Are Food Based Welfare Programmes Doing Enough?** is the result of investigation carried out by me in the Department of Humanities and Social Sciences, Indian Institute of Technology Guwahati, India, under the supervision of Dr. Rajshree Bedamatta, Associate Professor (Economics), Department of Humanities and Social Sciences, IIT Guwahati.

In keeping with general practice of reporting observations, due acknowledgement has been made wherever the work describes is based on the findings of other investigations.

Mahsina Rahman

## Certificate

This is to certify that the thesis entitled **A Study of Food Security in Rural Assam: Are Food Based Welfare Programmes Doing Enough?** submitted by Mahsina Rahman for the Degree of Doctor of Philosophy in Economics in the Department of Humanities and Social Sciences, Indian Institute of Technology Guwahati, India, embodies bonafide record of research work carried out under my supervision. The collection of materials from the secondary and primary sources has also been done by Ms. Mahsina Rahman herself. All assistance received has been duly acknowledged.

The present thesis or any part thereof has not been submitted to any other University for any degree or diploma.

(Dr. Rajshree Bedamatta)

Supervisor

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## Abstract

The poverty literature in India shows that the eastern region comprising Assam, Bihar, Odisha, and West Bengal have had the lowest growth rate in average per capita consumption expenditure and decline in poverty ratios since the 1990s. Direct and indirect estimates of poverty show rural Assam as being one of the poorest states of India (36.4 per cent and 87.5 per cent respectively in 2003-04). The official head count ratio of poverty for Assam stagnated in the period of 1990s and increased in the 2000s. The latest poverty estimates for the period of 2004-05 to 2009-10 shows poverty ratio in Assam to have increased by almost four percentage points (NSSO 61<sup>st</sup> and 66<sup>th</sup> rounds). The share of food expenditure in total household expenditure of rural Assam is very high (66 percent in 2004-05 and 64.4 per cent in 2009-10). Health outcome indicators such as maternal mortality (300 per one lakh live birth in 2013) and infant mortality are also one of the highest in Assam (54 per 1000 live birth in 2013). This thesis studies the three major components of National Food Security Act in India – targeted public distribution system (TPDS), Integrated Child Development Services (ICDS) and mid-day meal (MDM) programme. The major thrust of this thesis is to look at the contribution of food based welfare programmes to household level food security.

Unlike many other Indian states, Government of Assam does not maintain a state buffer of foodgrains for public distribution system (PDS). Neither does it provide a state subsidy to the end consumers. However a state government sponsored welfare programme named Mukhya Mantrir Anna Suraksha Yojana (MMASY) was implemented between 2011 and 2014 for selected APL households based upon an income criterion, which has since been discontinued. Different state issue prices are specified for regions falling under plain, riverine and hill areas. Within these region categories, different state issue prices apply based upon the geographical distance from the Gram Panchayat Samabay Samiti (GPSS) to fair price shop (FPS). This difference in SIP is to cover the costs of transportation of the FPS dealers. Consequently, the prices charged from the end consumers also differ. Studies have shown that such different sets of prices charged from consumers led to information distortion and exclusion at the household level. Further government data on TPDS beneficiaries (Below Poverty Line and Antyodaya Anna Yojana) have not been revised since 1997-98 in Assam.

Field survey data on food based welfare programmes was collected from Chaudhurirchar revenue village of Dhubri district and Kumargaon revenue village of Jorhat district. The state issue price specified for riverine regions therefore apply to Chaudhurirchar and that of plain area to Kumargaon. The staple food consumed by households in both villages was rice and locally available seasonal vegetables. Both villages were affected by recurrent floods and soil erosion. Proportion of households having access to home grown food throughout the year was therefore very less. Consequently dependence on food based welfare programmes was high in both villages. In Chaudhurirchar households were found to possess BPL, AAY and MMASY cards. None of the households possessed APL Cards. During the period of survey, the MMASY cards had already become obsolete due to discontinuation of the scheme. In Kumargaon village, all four kinds of cards were possessed by the households however MMASY was no longer in use.

The most striking finding from the field study was the large amount of leakages of PDS foodgrains at the FPS level. The incidence of leakages was comparatively higher in Chaudhurirchar village than in Kumargaon. None of the respondents in the former reported utilizing their legal entitlement. For example, an AAY household was entitled to 35 kgs of rice per month while the amount consumed was only 30 kg. Similarly a BPL household that was entitled to 33.33 kg per month could also utilize only 30 kg. Apart from curtailment of their legal entitlement of 35 kg, the SIP charged from BPL households was higher than the state specified SIP for riverine areas. Clearly the households in Chaudhurirchar village did not receive their entitled subsidy. In Kumargaon the legal quantity entitlements were more or less available to the households. The price charged from the end consumer was however much higher than the SIP for plain areas. Exclusion error estimates based on landholdings and occupation categories were found to be very high in both villages.

Pooled regression showed that households possessing operational land holdings, with higher MPCE and those accessing TPDS through BPL card entitlements are facing less foodgrains consumption deviation from the norm. In other words they are relatively more food secure than rest of the households. The ICDS and MDM programmes in both villages were found to be fully utilized in both the study villages. Lack of basic infrastructure and irregularity of funds were major problem areas. Overall the dependence and demand for food based welfare programmes in the study villages are extremely high.

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*LIST OF ABBREVIATIONS USED IN THE THESIS*

AAY	Antyodaya Anna Yojana
AIE	Alternative and Innovative Education
ANM	Auxiliary Nurse Midwife
APL	Above Poverty Line
ASHA	Accredited Social Health Activist
AWC	Anganwadi Centre
AWW	Anganwadi Worker
BPL	Below Poverty Line
CFSVA	Comprehensive Food Security and Vulnerability Assessment
CHC	Community Health Centre
CIP	Central Issue Price
CMDM	Cooked Mid Day Meal
CMR	Child Mortality Rate
CAG	Comptroller and Auditor General
CPI	Consumer Price Index
CPIAL	Consumer Price Index for Agricultural Labourer
FAO	Food and Agricultural Organisation
FFW	Food For Work
FIARI	Food Insecurity Atlas of Rural India
FIAUI	Food Insecurity Atlas of Urban India
FPSs	Fair Price Shops
FSA	Food Security Atlas
GDP	Gross Domestic Product
GoA	Government of Assam
GoI	Government of India
GPSS	Gram Panchayat Samabay Samities
HCR	Head Count Ratio
HYV	High Yielding Variety
ICDS	Integrated Child Development Services
ICMR	Indian Council of Medical Research
ICSSR	Indian Council of Social Science Research
IMR	Infant Mortality Rate

IRRI	International Rice Research Institute
LHV	Lady Health Visitor
MDM	Mid Day Meal
MMASY	Mukhya Mantrir Anna Suraksha Yojana
MPCE	Monthly Per Capita Expenditure
MPCE <sub>URP</sub>	Monthly Per Capita Expenditure Uniform Recall period
MPCE <sub>MRP</sub>	Monthly Per Capita Expenditure Mixed Recall period
MPCE <sub>MMRP</sub>	Monthly Per Capita Expenditure Modified Mixed Recall period
MSSRF	MS Swaminathan Research Foundation
NAC	National Advisory Council
NCAER	National Council of Applied Economic Research
NCLP	National Child Labour Project School
NER	North Eastern Region
NFHS	National Family Health Survey
NFSA	National Food Security Act
NHE	Nutrition and Health Education
NP- NSPE	National Programme of Nutritional Support to Primary Education
NSSO	National Sample Survey Organisations
OAU	Organisation of African Unity
OBC	Other Backward Class
PEO	Planning Evaluation Offices
PH	Priority Household
PHC	Primary Health Centre
RDA	Recommended Dietary Allowance
RJA	Randhan Jyoti Asoni
SC	Schedule Caste
SIP	State Issue Price
SNP	Supplementary Nutrition Programme
SOFIARI	State of Food Insecurity Atlas in Rural India
SOFIAUI	State of food Insecurity Atlas of Urban India
ST	Schedule Tribe
TE	Triennium Ending
THR	Take Home Ration

TPDS	Targeted Public Distribution System
UNDP	United Nations development Programme
UNICEF	United Nations Institutions for child Education Fund
UNROSA	United Nations Regional Office for South Africa
UT	Union Territory
UPDS	Universal Public Distribution System
VGB	Village Grain Bank
WFP	World Food Programme



## Chapter 1

### Introduction and Literature Review

This thesis studies the major food based welfare programmes in operation in Assam and their contribution to household food security. Recent estimates show that India has slipped in the global hunger index ranks. India ranks 100 among 119 countries of the world in 2017, as against 97 in 2016 (Grebmer *et al*, 2016, 2017). The poverty literature in India shows that the eastern region comprising Assam, Bihar, Odisha, and West Bengal have had the lowest growth rates in average per capita consumption expenditure and decline in poverty ratios since the 1990s (Deaton and Dreze, 2002; Patnaik, 2007; GoI, 2011; GoI, 2012).

Direct and indirect estimates of poverty show rural Assam as being one of the poorest states of in India (36.4 per cent and 87.5 per cent respectively in 2003-04). The official head count ratio of poverty for rural Assam stagnated in the period of 1990s and increased in the 2000s. The latest poverty estimates for the period 2004-05 to 2009-10 shows poverty ratio in Assam to have increased by almost four percentage points (NSSO 61st and 66th rounds). The share of food expenditure in total household expenditure of rural Assam is very high (66 percent in 2004-05 and 64.4 per cent in 2009-10). Health outcome indicators such as maternal mortality (300 per one lakh live birth in 2013) and infant mortality are also one of the highest in Assam (54 per 1000 live birth in 2013).

In the above backdrop this thesis studies the three major components of National Food Security Act in India – targeted public distribution system (TPDS), Integrated Child Development Services (ICDS) and mid-day meal (MDM) programme. Assam was one of the first Indian states to have implemented the National Food Security Act (NFSA) in December 2015. While the major thrust of this thesis is to look at the contribution of food

based welfare programmes to household level food security, attempt is also to evaluate the food security programmes in the context of NFSA.

### 1.1 BACKGROUND OF THE STUDY

India has the largest number of hungry people in the world (Grebmer *et al.* 2010; 2016). It has been estimated that the number of hungry people in India is even greater than the sub-Saharan African region which is the worst performer in terms of human development indicators. India's rank in the Global Hunger Index 2010 was 67 out of 84 countries, which is one of the lowest among the south Asian countries. Between 1990 and 2010, many of the erstwhile low human development countries like Angola, Ethiopia, Ghana, Mozambique, Nicaragua and Vietnam made significant improvements in their hunger index scores whereas India is still classified under those facing 'alarming levels of hunger'. Population estimates at the global level show that more than 230 million people in India do not know where their next meal will come from and suffer from chronic undernourishment (FAO, 2009). It is also estimated that India's poor carry between one-third and one-fourth of the global burden of food insecurity.

Towards the end of the decade of the 1990s, poverty estimates emerging from the consumer expenditure rounds of the Indian National Sample Survey Organization (NSSO 55<sup>th</sup> round, 1999-2000) showed that head count ratio of poverty in India had declined drastically as compared to the early 1990s (NSSO 50<sup>th</sup> round, 1993-94) (Deaton and Dreze, 2002). The official head count ratio of poverty for rural India showed a decline from 39.4 per cent in 1987-88 and 37.1 per cent in 1993-94 to 26.8 per cent in 1999-2000.<sup>1</sup> Deaton and Dreze

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<sup>1</sup>There have been numerous debates and discussions regarding incomparability of the NSSO 55<sup>th</sup> and 50<sup>th</sup> consumer expenditure rounds due to changes in recall period for food and non-food items (see for example Sen, 2000; Deaton and Kozel, 2005; Sundaram and Tendulkar, 2001; 2003, Sen and Himanshu, 2004 and Popli, Parikh and Palmer-Jones, 2005). The recall period terminologies used here are the uniform reference period and the mixed reference period. Uniform reference period (MPCE<sub>URP</sub>) means when household

(2002) published 'adjusted estimates'<sup>2</sup> based on which poverty ratios had declined from 39 per cent in 1987-88 to 33 per cent in 1993-94 and 26.3 per cent in 1999-2000. However, NSSO estimates showed that during the same period, cereals consumption, which is the major source of energy for Indian consumers had also gone down for all income groups of population. Supporters of the 'new-market economy' argued this was due to a shift in consumption pattern of people from cereals to non-cereals like milk, meat, eggs, vegetables and other products (Rao, 2000; Mittal, 2007; Pingali and Khwaja, 2004; Basu and Basole, 2012).

But calculations carried out by Deaton and Dreze (2002) show that consumption of non-cereal food items did not increase for those in the lower monthly per capita expenditure (MPCE) classes (also see Landy, 2009). A general conclusion arising from Deaton and Dreze (2002) was that poverty ratios in the Indian states had relatively declined, although they were careful in not claiming that market reforms policies of the early 1990s were responsible for the lowered rates of poverty. One of the important findings from Deaton and Dreze (2002) pertained to performance of states at the regional level. They found that between 1987-88 and 1999-2000, although there has been a sustained decline in poverty rates for almost all the Indian states, the only notable exception was Assam where both rural and urban poverty stagnated (adjusted estimates of head count ratio of poverty for Assam was 36.1 per cent in 1987-88, 35.4 per cent in 1993-94 and 35.5 per cent in 1999-2000). The

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consumer expenditure on each item is recorded for reference period of 'last 30days' and mixed reference period (MPCE<sub>MRP</sub>) implies when household consumer expenditure for non-food items is recorded for 'last 365 days'. NSSO 55<sup>th</sup> round uses MPCE<sub>MRP</sub> for the first time to measure household consumer expenditure. Therefore literature shows that there is data contamination of the 55<sup>th</sup> round results and hence problems of comparability with the previous rounds. However consumption expenditure for food items is comparable with the previous rounds because MPCE<sub>URP</sub> has been considered in all the rounds (see Sen and Himanshu, 2004).

<sup>2</sup>Deaton and Dreze have adjusted the poverty estimates of the 55<sup>th</sup> and 60<sup>th</sup> rounds to make them comparable with the poverty estimates of earlier large rounds. These adjustments were made due to differences in data quality of consumer expenditure on various goods (see Deaton and Dreze, 2002 and Deaton, 2003).

growth rates of average per capita consumption expenditure during the same period also showed that the eastern states of Assam, West Bengal and Odisha formed 'one contiguous region' of low growth states (*ibid*).

However, the poverty estimates of the 1990s have been strongly contested. For example Patnaik (2007) provided 'direct poverty estimates' based on the poverty line definition of energy intake according to calorie norms.<sup>2</sup> The conclusion emerging from her paper is that over time, there is a divergence between the 'official indirect estimates' of poverty and her own 'direct estimates' of poverty based on nutrition norms. For example, the official poverty estimates show that at the all-India level, poverty ratio declined from 37 per cent in 1993-94 to 27 per cent in 1999-2000. However, based on Patnaik's (2007) direct estimates we see that in 1993-94, 75 per cent of the population in India was consuming less than 2400 calories and in 1999-2000 the share was still 74.5 per cent.<sup>3</sup> The corresponding estimates for 2004-05 are 28.3 per cent based on official indirect estimates and 87 per cent based on direct estimates. Therefore the direct estimates based on energy intakes clearly show that poverty rates far from declining have actually stagnated at the all-India level in the 1990s and increased in the early 2000s. Further, contrary to as is being made out of the official indirect estimates, the levels of poverty based on actual calorie intakes are much higher.

The author also provides estimates based on the calorie norm of 2100 calories and based on that the poverty rates at the all-India level turn out to be 49.2 per cent in 1993-94 and 49.5

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<sup>2</sup> Direct method of poverty estimate is based on particular observed level of expenditure per capita per month on all goods and services, where expenditure on food items provide a daily energy intake of 2400 calories per capita for rural areas and 2100 calories per capita for urban areas. Indirect method of poverty measures are based on Consumer Price Index for Agricultural Labourers (CPIAL) (see Patnaik, 2007).

<sup>3</sup> Calorie norm of poverty line is that dimension of poverty which focuses on the ability to access minimum nutrition level expressed in terms of a norm of daily energy intake in calories which calls for proper functioning of health of an individual. The calorie norm is based on the recommendation of Indian Council of Medical Research norm on dietary intakes which is applied according to the structure of gender, age of the person (for more see Dandekar and Rath, 1981; Patnaik, 2007)

per cent in 1999-2000. Taking the 2400 calorie norm, poverty rate of Assam was 93 per cent in 1993-94 and 91 per cent in 1999-2000; and the 2100 calorie norm showed poverty rates of 62 per cent in 1993-94 and 71 per cent in 1999-2000. The direct poverty estimates for 2004-05 (based on 2400 calorie norm) shows poverty ratio of Assam to be as high as 87.5 per cent, the highest in the eastern region (including Bihar, Jharkhand, Orissa and West Bengal) (see Patnaik, 2007).<sup>4</sup>

The NSSO 66<sup>th</sup> round (2009-10) results on consumption expenditure is already out but we currently do not have direct estimates of poverty based on the lines of Patnaik (2007). However, what we do have are head count ratios of poverty for states based on the Tendulkar Committee report (see GOI, 2011; 2012). Based on the Tendulkar methodology estimates, all-India head count ratio of poverty has declined from 37.2 per cent in 2004-05 to 29.8 per cent in 2009-10.<sup>5</sup> However, for Assam, the poverty ratios have increased in both rural and urban areas. Rural (urban) poverty in Assam has increased from 36.4 per cent (21.8 per cent) in 2004-05 to 39.9 per cent (26.1 per cent) in 2009-10. Overall, poverty ratio in Assam has increased by 3.5 percentage points between 2004-05 and 2009-10.

From what follows, the literature reflects differences in poverty estimates based on official head count ratios (Planning Commission, various years), Deaton and Dreze (2002) adjusted

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<sup>4</sup> Poverty ratios calculated by the direct method for calorie intakes of 2200 and 1800 shows changes in poverty rates across states. Based on the 2200 calorie norm, direct estimates of 2004-05 shows poverty rate highest in Bihar (68.5 per cent) among the eastern states; for a 1800 calorie norm, highest poverty rate is recorded for Odisha (27.5 per cent) (all calculations are contained in Patnaik, 2007).

<sup>5</sup> What we know as official estimates of poverty in India is based on the recommendations of the Lakdawala Committee of 1993 taking into account the per capita consumption level associated with a commodity bundle yielding specific level of calories (at 1973-74 prices). However, over a period of time, it has been felt that the link between calorie intake and poverty has become weak. The Planning Commission formed an Expert Group in 2005 with Professor S. D. Tendulkar as its chairman to make recommendations about new poverty lines. The Tendulkar Committee recommendations provide us with new poverty estimates which are higher than the Lakdawala Committee estimates. For the sake of comparability, Tendulkar methodology has been used to compute poverty estimates for 1993-94, 2004-05 and 2009-10 (GoI, 2001; 2012).

estimates, Patnaik (2007) direct estimates based on energy intake and Tendulkar methodology (GOI, 2011; 2012). However what emerges is that some of the lowest growth rates in terms of average per capita consumption expenditure and decline in poverty ratios are recorded for the eastern region of India comprising of Assam, Bihar, Odisha and West Bengal. Estimates also show that poverty rates in Assam have stagnated in the period of 1990s and increased in the 2000s. The latest poverty estimates for the period 2004-05 to 2009-10, which shows poverty ratios in Assam to have increased, by almost four percentage points, is a more disturbing trend.

### *1.2 FOOD PRICE VOLATILITY OF THE 1990S AND 2000S*

Since the beginning of the last decade, there has been a rising trend of food prices in the international market. The later part of the decades of 2000s has particularly been a year of rising food prices, since the food price peak of mid-1970s (Braun, 2008; Mitchell, 2008). Since 2002, prices of almost all agricultural commodities have risen (Mitchell, 2008). Under such conditions of rising prices of agricultural commodities in the international market, countries that are net food exporters stand to gain while the net food importers lose. In response, many countries have followed a policy prescription of imposing export restrictions to cater to the most immediate needs of the domestic economy (Braun, 2008). However, what concerns is the food security of large sections of vulnerable population in agrarian economies. It has been argued that the South Asian region is highly vulnerable to food price inflation as large segments of their population live in poverty (see for example, Carrasco and Mukhopadhyay, 2012).

In the Indian context, a pattern of rising food prices was anticipated since the 1990s. Patnaik (1997) argues that in the post economic liberalization phase, Indian agriculture moved from a 'food first' policy to 'export first policy'. The author broadly delineated two

phases of agricultural policies: one, the period between 1950s and 1990 when there was emphasis on increasing foodgrains production, procurement and distribution and the period from 1990s onward which saw an increase in direct export of foodgrains. The 1990s was a period when the agricultural sector engaged itself in exports of non-cereal agricultural products while importing cereal products from the advanced countries. Along with increase in direct export of non-cereal agro products, there was also diversion of food producing land to production of non-grain agricultural products. Such a policy accompanied with cuts in social sector expenditure, increased privatization, and a number of 'demand contracting' monetary and fiscal policies led to a situation of income deflation among the large masses of people in India (Patnaik, 1996) which inevitably resulted in a pattern of increasing poverty rates and undermining the state of food security (Patnaik, 1996; 1997). The export import policy of the early 1990s which advocated for financing of increasing food imports through agro-export earnings was based on misplaced reasoning, as Patnaik (1997) points out there was no comparative advantage in following such a trade policy. This is so because there is a basic difficulty in defining the relative prices of goods over a large range of products. Also, a theory of comparative costs is applicable only when both countries can produce the goods to be traded. But in the context of countries like India and advanced countries like Britain and Japan natural climatic factors limit production of primary agricultural products in the latter countries. Therefore, the export of primary products and import of processed products breaks down based upon this logical fallacy (see Patnaik, 1996).

The predictions based on Patnaik (1996 and 1997) have later been experienced in countries like India and Bangladesh where food price hike became a major economic problem. Rural food prices of India have increased 4.8 times from 1983 to 2004-05. But cereal prices for India have increased more rapidly between 1993-94 and 1999-2000 than other food prices.

It is also now well established that hunger and deprivation are increasing, and people are purchasing fewer calories especially cereal calorie because they cannot afford to buy it (Swaminathan, 2000; Patnaik, 2007). Cuts in social sector expenditure have been a major issue of the 1990s. In order to reduce the debt burden and to reduce their budgetary deficits, governments in the developing countries have reduces their social sector expenditures in sectors like health, education and even in the most unavoidable food sector. Swaminathan (1996) shows that there has been a continuous decline in expenditure on food subsidies in India as a percentage of gross domestic product (GDP). The author estimated share of food subsidies to GDP for India pertaining to the period 1989-90 to 1995-96 and found that during the entire period expenditure on food subsidies accounted to only 1 per cent of the GDP. In 1989-90 food subsidy was 0.6 per cent of the GDP which declined to 0.4 per cent in 1992-93 and then slightly increased to 0.5 per cent in 1995-96.

From what we know about skewed levels of distribution of income in India, and stagnating or very high levels of poverty, the fall in food subsidy affect poor people by reducing accessibility to food. There has also been a rise in both procurement price and issue price of foodgrains between 1990 and 1995. However, of the two, the consumer's issue price has been much higher than the producer's procurement price. For example in 1993-94, the issue price of common rice in India was Rs. 537 per quintal and procurement price was Rs. 465, which means that the consumer had to pay an extra of Rs. 72 for the same amount and same variety of rice (Swaminathan, 1996 and 1999).

There is a large volume of literature on impact of economic liberalization policies on agriculture in India and other South Asian countries. Although there are an equal number of academics arguing for and against, some of the most influential literature strongly argues that after the period of liberalization, the problems of food availability and accessibility increased in Pakistan, Bhutan, India, Nepal, and Myanmar, who incidentally are also the

countries that face high rates of food price inflation (Patel, 1994; Swaminathan, 1996; Patnaik, 1996).

### 1.3 UNDERSTANDING THE TERM FOOD SECURITY

The term 'food security' gained particular significance after the World Food Conference of 1974 in Rome. The emphasis then was on 'adequate food supplies' to meet consumption requirements (FAO, WFP and IFAD, 2012). Prior to the World Food Conference of 1974, in the period from 1940s to 1960s, countries engaged themselves with policies surrounding increasing agricultural productivity leading to surpluses. For example, in countries like India there was an overwhelming emphasis on creation of buffer stocks (Mooij, 1998; Pinstруп 2009). Thus for a large part of the 1970s, supply side factors were the major explanatory variables explaining world food security (Mechlem, 2004,).

However, appearance of Amartya Sen's 'Poverty and Famines: An Essay on Entitlements and Deprivation' (1981) changed the wave towards demand-side factors such as 'entitlement' of individuals and households. Early 1980s was a period of failed foodgrain harvests in many of the countries of the world resulting in a food supply crisis. However, it was also during this time that Sen's entitlement approach provided the strong argument based on empirical investigation of famines in India and Africa that 'starvation is the characteristic of some people not *having* enough food to eat...and not of there *being* not enough food to eat' (Sen, 1981). The FAO thus enlarged its concept of food security which was for long restricted to enlarging food supplies. The concept now included three important goals: (a) maintaining adequate food supplies (b) ensuring stable food supplies as well as markets and (c) ensuring secured access to food supplies (FAO, WFP and IFAD, 2012).

The ensuing period between the 1970s and early 1990s brought about significant changes in the understanding of the concept of food security. We moved from narrow definitions of “enough food available at the global, national, community or household level” to issues of “accessibility” (see Mechlem, 2004). Although there are various policy documents that harped on food and non-food factors explaining food and nutrition security, some of them need particular mention. One such document is the United Nations Children’s Emergency Fund’s ‘Conceptual Framework for Understanding the Causes of Malnutrition’. This document laid special emphasis on health care as one of the important non-food factors that ensures nutrition achievements among children (see Maxwell, 1996; FAO, WFP and IFAD 2012). The World Conference of 1996 gave a landmark definition of food security which is widely accepted by countries. It says, “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 and food preferences for an active and healthy life” (FAO, 1996). Table A1.1 in Appendix gives a tabulated outline of initiatives carried out towards ensuring food security from the 1940s to the present.

#### *1.4 THE STATE OF FOOD INSECURITY IN RURAL INDIA AND ASSAM*

One of the first attempts at mapping of food insecurity among Indian states was carried out by the MS Swaminathan Research Foundation (MSSRF) and World Food Program (Food Insecurity Atlas of Rural India, 2001) in which the states of India were categorized on differing levels of food insecurity. The broad indicators based on which food insecurity mapping was carried out are: food availability, food accessibility, and food absorption. The Atlas revealed that some of the most food insecure states were largely concentrated in the eastern region of India. Bihar was classified as an ‘extremely food insecure’ state, Odisha

was classified as a 'severely food insecure' state and the states of West Bengal and Assam classified as 'moderately food insecure' states.

One of the striking findings that emerges in the context of Assam is that of it being a 'severely food deficit' state. More specifically, Assam faces a deficit of food production over consumption requirements. The recommended Indian Council of Medical Research (ICMR) norm of consumption of cereals per person per day is 420 grams, whereas the net per capita per day production of cereals in Assam meets only 16.1 grams of the required consumption. A comparison with the all-India average shows per capita per day production of cereals was 430.3 grams. The per capita per day production of cereals in Assam was found to be the lowest among all the 16 states that have been mapped by the Food Insecurity Atlas of Rural India, 2001. Similarly the percentage of households consuming less than the ICMR recommended 2400 Kcal of food per day was also one of the highest in Assam (53.9 per cent). The comparable all-India average estimate was 42 per cent. The Atlas pointed out that percentage of population consuming less than the ICMR recommended nutrients showed the "spread of hunger" in the states. Assam's situation of a food-deficit state accompanied by its spread of hunger also showed that the "depth of hunger" in Assam was quite high (MSSRF and WFP, 2001).

The food insecurity mapping of states have been carried out by MSSRF and WFP in two time periods: 1998-2000 and 2004-06. States were categorized under five classes or levels of food insecurity. They are (a) Very low level of food insecurity (b) Low level of food insecurity (c) moderate level of food insecurity (d) High level of food insecurity and (e) Very high level of food insecurity. Assam figured under the category of moderate food insecurity in both the time periods. However, if we look at some of the individual indicators of food security, for example, rise in chronic energy deficiency among women and anemia among

rural children; one can conclude that both the spread and depth of hunger in Assam have risen in the recent years.

In 2001, when the Food Insecurity Atlas of Rural India was carried out, the head count ratio of poverty in Assam was high as 45.01 per cent, next only to the poorest states of Bihar (58.21 per cent) and Odisha (49.72 per cent).<sup>6</sup> States were also ranked based on food absorption indicators to assess nutritional adequacy. Assam was found to be high on protein calorie inadequacy. Similarly the percentage of women and children suffering from anemia was also very high in Assam. In 2008, MSSRF and WFP came up with a report on the State of Food Insecurity in Rural India (MSSRF and WFP, 2008) which was an improvement on the Food Insecurity Atlas of Rural India 2001. The food insecurity status of Assam based on SOFIRI 2008 showed drastic deterioration in food security indicators of Assam. For example, between 1998 and 2005-06, levels of chronic energy deficiency among women in Assam is seen to have increased by 11 percentage points (from 27.9 per cent in 1998-99 to 39.5 per cent in 2005-06). The percentage of rural children suffering from anemia rose by 14 percentage points (from 63.8 per cent in 1998-99 to 77.4 per cent in 2005-06).

The National Family Health Survey (NFHS) which was carried out at three different point of time (NFHS- I, 1992-93, NFHS-II, 1998-99 and NFHS- III 2005-06) is also another source of rich data providing overall health conditions of women and children for the Indian states. Data for Assam show that there was continuous increase in infant mortality rate (IMR)<sup>7</sup> of Assam between 1992-93 and 2005-06. It increased from 66 per cent in 1992-

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<sup>6</sup>Poverty estimates of the report are cited from, NIRD, India Rural Development Report 1999 which are Planning commission estimates( see MSSRF and WFP, pp. 46-47)

<sup>7</sup>Infant Mortality Rate is defined as the probability of dying of a child before reaching his/her first birthday (IIPS, 1995).

93 to 70 per cent in 1998-99 and to 89 per cent in 2005-06. Though the increase in IMR was noticed both in case of rural and urban areas, the rate of increase for the rural areas has been at an alarming level. In rural Assam the increase in IMR was recorded at 67 per cent during 1992-93 which went up to 89 per cent in 2005-06. In urban Assam IMR went up from 58 per cent in 1992-93 to 67 per cent in 2005-06. Similarly, in 1992-93 child mortality rate of Assam was the highest (58.7 per cent) in India.

All the NFHS reports also show that there exist chronic undernourishment and anemia among children (age group of 0-4 years) in Assam. Undernourishment and anemia among children are also issues highlighted by the Food Insecurity Atlas of Rural India, 2001. In NFHS-II about 36 per cent of children in Assam were underweight which increased to 50 per cent in NFHS-III. In 1998-99 (NFHS-II) children suffering from anemia was above 63 per cent and the share went up to 77 per cent in 2005-06 (NFHS-III). This re-establishes nutritional deficiency and deteriorating health conditions of children in Assam over the period of 1990s and 2000s.

The NSSO large rounds show that in India total food expenditure as a percentage of total consumer expenditure is still higher than total non-food expenditure. The average monthly per capita expenditure is also high for food items than non-food items. In 2005-06, in rural Assam, the share of food expenditure in total consumption expenditure was as high as 66 per cent. At the all-India level it was 55 per cent (NSSO, 2004-05). In 2009-2010 although the share of food expenditure declined to 64 per cent in rural Assam, it was still higher than the all-India average of 53.6 per cent (NSSO, 2009-10).

We have seen in an earlier section that within food, expenditure on cereals forms the largest share. An average person in rural Assam therefore spends more on cereals than many of the other states of India. It is interesting to note that in 2004-05, average monthly per capita

consumption of cereals in rural Assam was 13.4 kg and in 2009-10 declined to 12.6 kg. However, monthly per capita consumption expenditure on cereals increased from Rs 134.81 in 2004-05 to Rs 207.81 in 2009-10. And contrary to the pattern emerging from the other states where decline in cereals intake is also accompanied by decline in poverty ratios, in Assam, there is an opposition pattern: decline in cereal intake accompanies increase in poverty ratios. This reinforces that food expenditure has continuously occupied a major share of consumer's total monthly household expenditure and money spent on food takes away the major share of household income. And when the sources of household income are irregular, as in the case of agricultural incomes and non-salaried families of the rural areas, the impact of this expenditure falls heavily on the general living conditions.

### *1.5 THE ENTITLEMENT APPROACH AND FOOD SECURITY:*

#### *A THEORETICAL FRAMEWORK*

Sen's 1981 thesis on 'entitlement approach' was backed by empirical investigations of famines in Bengal, Ethiopia and the Sahel. The basic features of the entitlement approach are as follows. The 'entitlement set' of a person contains two parameters: a) an ownership bundle or what Sen calls the 'endowment set' and (b) exchange entitlement mapping or 'E-mapping' (Sen, 1981; Dreze and Sen, 1991). For example, a person owning land and labour resources can be said to be having an endowment set consisting of land and labour; her exchange entitlement then consists of what she can earn out of her resources (using land for production and exchange of labour for wages). If her endowment set and exchange entitlement mapping together allow her to have the minimum requirement of food then she is said to be above the 'starvation set'. But if either one or both the parameters does not provide her the minimum food requirements then she suffers from starvation. In this way, the entitlement approach for the first time provided a systematic understanding of conditions that led to starvation of an individual/or at household level. Empirical facts

emerging from the Indian and African famines led Sen to advocate that hunger and malnutrition can be traced to failures in acquirement of food due to entitlement failures (Dreze and Sen, 1989; Dreze and Sen, 1991).

Since the 1980s, Sen's entitlement approach has been used to explain conditions of food insecurity in the developing countries. Scholars like S. R. Osmani have further extended the entitlement approach to explain social security interventions in developing countries (Osmani, 1991; 1995). Osmani adds three components to Sen's entitlement mapping. They are (a) production component (b) exchange component and (c) transfer component. The production component is production function which in turn is dependent upon the endowment set of the individual (e.g. quality of land, technology of food production etc.). The exchange component looks at the conditions that enable translation of endowment (such as labour power) into earnings (or wage rate at which the labour power can be sold). The transfer component consists of institutional mechanisms or state support systems (e.g. welfare programmes or anti-poverty interventions) that improves entitlement mapping of the individual. Osmani suggests that the endowment set along with E-mapping consisting of all its constituent components determines an individual's/household's ability to acquire food (Osmani, 1995). He also adds the importance of 'resource control' within the households that determine intra-household distribution of food (*ibid*).

Another strain of thought that emerges from Sen's 1980s literature is the 'capabilities perspective' to assessing the 'well-being' of an individual (Sen, 1981; 1985; 1992). The capabilities perspective arose mostly in response to income poverty as one of the important criterion for determining levels of development. Sen forwarded the notion that income as an indicator of development did not reveal inequalities in individual achievements (e.g. health, education and gender inequality). He defines capabilities as 'a set of vectors of functioning, reflecting the person's freedom to lead one type of life or another' where 'functionings' refer

to a set of 'beings and doings' such as 'being adequately nourished', 'being in good health', and 'avoiding escapable morbidity and premature mortality' (Sen, 1992).

In his 1999 work on 'Development as Freedom' Sen provides a framework of 'constitutive and instrumental role of freedom' in development. Some of the instrumental freedoms highlighted by Sen (e.g. political freedoms, social opportunities, transparency guarantees and protective security) also form a subset of exchange entitlement as forwarded by the entitlement approach in 1981. Looked at in this light, considering that people's functionings differ based on their entitlement set and capabilities, the benefits of economic growth are also reaped by different sections of the population differently. In this context Sen argued that some long term policies are needed to enhance, secure and guarantee entitlements rather than just increasing food output at the national level (Sen, 1981). In support, Sen strongly advocates policy instruments of public intervention, such as free and subsidized food distribution, free school meals for children, and widespread health intervention (*ibid*). See Fig. 1.1 for a pictorial summarization of the Entitlement Approach.

#### *1.6 THE ROLE OF FOOD BASED INTERVENTIONS IN ENSURING FOOD SECURITY*

Guhan (1994) provides a useful categorization of social security measures that may be carried out in the developing countries. It has been felt that the formal social security measures (pensions, social insurance etc.) of the developed countries cannot be followed in the developing countries and so they have to be integrated in the larger framework of poverty alleviation measures. Guhan provides a broad taxonomy of (1) promotional measures (2) preventive measures and (3) protective measures. From Sen's entitlement approach point of view, promotional measures expand 'endowments, exchange

entitlements, real incomes and social consumption’, preventive measures are direct answers to deprivation and protective measures guarantee relief from famines or sudden economic crisis or sharp recession. More precisely, Guhan presents them in the form of ‘concentric circles’ where the promotional and preventive measures are the outer circles and the protective measures are the inner circle.

The outer circle of promotional measures would include the whole array of macro-economic, sectoral and institutional measures of major importance for poverty reduction, operating at the macro and meso levels. Though oriented towards the poor, they may not be confined to them or addressed specifically to the prevention of actual types of deprivation (for example, primary education, primary health care, child nutrition, and slum improvement). *The middle circle would consist of what have come to be known as direct measures of poverty alleviation, such as asset redistribution, employment creation, and food security* (emphasis mine). The inner circle would contain specific measures for the relief from or protection against deprivation to the extent that the latter is not – or cannot be – averted through promotional and preventive approaches (Guhan 1994, p. 38).

Others (Dreze and Sen, 1991; 1995; 2002) do not find much distinction between Guhan’s promotional and preventive measures and consider them more or less to be of the same type. However, they do make a difference between promotion measures and protective measures. Dreze and Sen (1989) point out that protection of living standards from serious decline (e.g. preventing famine) and the promotion of this standard to permanently higher level (e.g. by eliminating chronic hunger, rampant morbidity etc.) is a challenge for social security. Thwarting food insecurity conditions therefore needs policies and programmes that are either promotional or preventive in nature.

Scholars like Burgess and Stern (1991) have definitively argued about the role of the government in provision of social security benefits. They essentially forward two reasons for government intervention. First, in the developing countries, markets (for example the credit

market) may not function efficiently and the poor may not have access to its benefits (say, credit). Secondly, intervention of the government improves distribution of social welfare. For example, the government may adopt tax policies that have huge re-distributive effects. Apart from these essential reasons the government may play a more paternalistic role as in the case of compulsory education for children, compulsory insurance or pension schemes. These are cases where a standard utility analysis measured by revealed preferences and market choices fail (*ibid*).

#### *1.6.1 Food based welfare programmes of India*

The Indian government has implemented various food based welfare programmes to meet the objective of food security. They can be broadly classified as (a) In-kind transfers such as the public distribution system (PDS), supplementary feeding programmes, nutrition programmes meant for children and pregnant women and (b) Direct cash transfers such as the wage employment programmes. The design of the Indian food security system has been guided by three broad strategies (a) Productivity enhancing investments in agriculture (b) Price support policies and maintenance of buffer stock and (c) Public food distribution system to ensure availability of selected essential food at reasonable prices at all times of the year (Chopra, 1981; Swaminathan 1996; 2000; Mooij, 1999; Ghosh, 2013).

Food policies and programmes in India may be categorized as those catering to the supply side factors and demand side factors. The period from 1950s to 1970s saw sustained efforts of the state towards increasing food production and maintaining buffer stocks. On the supply side a large number of programmes was started mainly after the food crisis of the 1960s (for example the Intensive Agriculture District Programme (1960), the Intensive Agriculture Area Programme (1964), the High Yielding Variety Programme (1965), the Intensive Area Development Scheme (1965)). Other programmes provided technical and

financial support to farmers through the new found policy of social banking in India (the Small Farmers Development Agency (1969) and the Agency for the Development of Marginal Farmers and Agricultural Labourers (1969). The 1960s was also a landmark period in terms of setting up of institutional mechanisms like the Food Corporation of India and the Commission for Agricultural Costs and Prices (1965) that made procurement and distribution of foodgrains more systematic (see Chopra 1981 and Bapna, 1990). On the demand side, the most important programmes were the public distribution system of food (since 1939), the food for work programme (1977), the wage employment programmes (since 1960s) which had an in-kind food component as wages, the Integrated Child Development Programme (1975), the mid-day meal programme (since 1960s in Tamil Nadu, 1995 in Kerala, Madhya Pradesh and Odisha and since 2002 universally in other states of India after the intervention of the Supreme Court of India), and the Annapurna and Antyodaya Anna Yojana (since 2000's).

On the demand side, the most important food based policy/programme that has been in operation in India is the public distribution system. Although the history of PDS is rooted in the form of war time rationing, after independence, it largely had a strong urban presence. However 1970s saw a transition in the system of public distribution of food in India. PDS which was more urban centric in nature now spread its networks into the rural areas (Swaminathan 1996, Shankar, 1997; Mooij 1999). The government of India made specifications regarding coverage of fair price shops per population and ration cards were distributed among all rural households (Swaminathan, 1996; 2000; 2008; Mooij, 1981 and 1999). Broadly, the period from the 1970s to the early 1990s can be considered as a period of universal distribution of food. However, the, from 1990s PDS policy favoured more targeted form of intervention.

The debates surrounding PDS in India has been of a varied nature. However, if we have to focus on the issues that have engulfed discussions of the 1990s and 2000s, they can be broadly categorized under two heads: (a) Universal versus targeted policies and (b) Efficiency costs versus exclusion errors.<sup>8</sup> There have been fierce contestations regarding what should be the nature of the PDS in India, particularly after the structural adjustment programme was initiated in the 1990s. The proponents of economic growth have pointed out that India is a growing country where poverty ratios have been steadily declining and excessive social expenditure through food subsidies results in excesses and wastages and hence there should be a narrow targeting of population based on means-testing (Radhakrishna, Subbarao, Indrakanth and Ravi, 1997; Jha and Srinivasan, 2001). The opponents of the neo-liberal economic regime of India have advocated for implementation of promotional and preventive social security measures such as universal food distribution programmes. They argue that levels of inequality in India are rising, absolute levels of poverty and malnourishment are also rising, and the state has withdrawn from its responsibility of increasing agricultural support. Therefore going back to a universal system of food distribution is the need of the hour (Sen, 1992; Parikh 1994; Patel 1994; Dev, 1996, Swaminathan 2000; Chand, 2005; Himanshu 2007; Swaminathan, 2008, Himanshu and Sen, 2011; Bedamatta, 2009, 2016).

The second issue of efficiency costs versus exclusion errors also follows the same line of reasoning as above. The overwhelming argument here is that large numbers of non-needy groups of population also take advantage of the PDS and that result in an efficiency cost which amount to a policy failure (Geetha and Suryanarayana, 1993; Ahluwalia, 1993). However, based on empirical evidences from other developing countries and field studies

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<sup>8</sup>Country case studies on these issues can be found in Cornia and Stewart (1993).

carried out in other parts of India, scholars have shown that a faulty system of targeting has resulted in large scale of errors of exclusion which is a larger welfare cost than costs of efficiency (Ramachandran, 1996; Mooij, 1999; Dev and Mooij, 2002; Dreze, 2004; Swaminathan 1996; 2000; 2008; Bilgrami and Gonsalves 2004).

#### *Mid-day Meal Programme*

Another important food based welfare programme that has been in operation in India is the mid-day meal (MDM) programme. At the global level the first school lunch programme was launched in France and Germany at the beginning of 19<sup>th</sup> century. Later on, it was introduced in various parts of the world e.g. US, UK, Japan, and Switzerland brought such programmes in their schools 1940's; Australia introduced it in 1950, China and Indonesia started it in 1960's, Thailand, Korea and Singapore introduced such school meal programme in 1970's (Rajan and Jayakumar, 1992; Si and Sharma, 2008). In India the first MDM programme was introduced by Madras city (present Chennai) in 1925. Later, it was introduced in Kolkata in 1928, Kerala in 1941 and in Mumbai in 1942 (*ibid*).

The Government of India launched National Programme of Nutritional Support to Primary Education or popularly known as MDM scheme in 1995 with the broad objective of universalizing the primary education and to improve the nutritional status of the children in all government and government assisted primary schools (Si and Sharma, 2008; Garg and Mandal, 2013). Tamil Nadu is the first state to provide cooked MDM since 1950s. Gujarat started this programme in 1980s. Other states which started providing cooked MDM since 1995 were Kerala, Madhya Pradesh and Odisha. The remaining states started implementing cooked MDM only after Supreme Court's deadline of universalizing the programme in 2002 (Khera, 2006). The MDM programme is completely financed by the Central government specifying 100 gram of food per student per day and the transportation of

foodgrains from the FCI to primary schools are subsidized. The cooking and fuel costs of the cooked meals which were previously borne by the state governments are since 2004 being met by the Central government.

There have been various assessment studies pertaining to MDM programme of India addressing issues of financing, adequacy of meals (quality and quantity), socialization and educational benefits, infrastructural problems coming in the way of an effective MDM programme and the like. The state of Tamil Nadu has set an example in terms of quality of food, infrastructure, administration, monitoring etc. Tamil Nadu government spends a large share of state budget on their noon meal programme. This has resulted in very fast increase in school enrolment, improvement in average attendance rate, improved child nutrition, decline in dropout rate in the state (Rajan and Jayakumar, 1992; Dreze, 2004; Viswanathan, 2006; Khera, 2013). Further, the states like Madhya Pradesh, Gujarat, Rajasthan and Karnataka has also improved the nutritional value of the food and improved their cooked MDM scheme. General conclusion emerging from various studies is that a universal MDM programme has been highly effective in meeting its primary objective of increased school enrolment rates as well as the secondary objectives of improving nutrition (Rajan and Jayakumar, 1992; Dreze and Kingdon, 2001; Dreze, 2004; Zaidi, 2005; Afridi, 2005; Jain and Shah, 2005; Deaton and Dreze, 2006, cited in Khera, 2006; Si and Sharma, 2008; Khera, 2013). However, at present the nutritional assessment of the food are the urgent requirement and more nutritious food like banana, egg, milk should be included to the list (Shukla, 2014). Although MDM has been effective in enrolment, attendance and nutrition among disadvantage group but it has not able to bridge the educational inequalities between marginal and well off group (Garg and Mandal, 2013).

### *Integrated Child Development Services (ICDS) Scheme*

The Integrated Child Development Services Scheme (ICDS) is a national scheme introduced in 1975 with the objective of providing nutrition to the children age between 0-6 years, pregnant and lactating women and adolescent girls belonging to the most vulnerable section of the society. The scheme is a comprehensive package of six services i.e. supplementary nutrition, pre-school education, nutrition and health education, immunisation, health checkup and referral services which is coordinated through Anganwadi Centres (AWC) and female workers known as Anganwadi workers(AWW) at the village level (EPW,1986; Swaminathan,1991; Dreze,2006; Balarajan and Reich,2016).

Among the six services, only the first service is related to the direct food intake. This service aims at bridging the gap between Recommended Dietary Allowance (RDA) and average daily intake of children, pregnant and lactating women. As per the norm, the children between 3-6 years are entitled to provide more than one meal for 300 days in year. The food includes breakfast in the morning which should be in the form of milk/banana/egg/seasonal fruit/ micro-nutrient fortified food followed by hot cooked meal in the noon. For children below 3 years of age, pregnant and lactating mothers, Take Home Rations (THR) including cereal, pulses, ready to eat food should be provided. Additional micronutrient fortified food or energy dense food are provided to the severely underweight children in the age group of 6 months to 6 years as THR. The last three services are health related services. This is one of the longest continuing schemes of India and assessments at various levels have shown the programme's positive impact on health and nutrition status of pre-school children (Krishnaraj, 2005; Sinha, 2006; Gragnolati et al' 2006; Saxena, 2002).

The result based on the 'Focus on Children Under Six' (FOCUS) survey conducted in six states of India i.e. Chhattisgarh, Himachal Pradesh, Maharashtra, Rajasthan, Tamil Nadu

and Uttar Pradesh shows that Tamil Nadu has sets example of effective implementation of ICDS among all other states. The state has wholeheartedly followed the principle of 'universalisation with quality' where the state government has done a major investment. Maharashtra and Himachal Pradesh is also following the path of Tamil Nadu. States like Chhattisgarh has introduced the community participation programmes like 'Mitaniin' which is an effective link between health and nutrition programmes with a very high awareness on the programmes among rural households (Garg 2006; Dreze, 2006). In opposition to this, Bihar, Jharkahnd and Uttar Pradesh are the laggard states (Dreze, 2006). A large number of beneficiaries of children, women and adolescent girls are excluded from the ICDS benefits in Bihar and Jharkhand due to ineffective utilisation of funds sanctioned by the central government to the state (Nayak and Saxena, 2006). Evaluations made of ICDS interventions show a positive impact on reducing infant mortality rates in Andhra Pradesh and Odisha (Saxena, 2002).

The ICDS functions through its network of Anganwadi in almost all the states of the country. Another evaluations at a regional level shows that in terms of regular supply of food to children through the ICDS, north eastern states are the worst performers and the better-off states are Himachal Pradesh, Maharashtra, Tamil Nadu and Goa (Medrano, 2004 cited in Swaminathan, 2008). It has been widely accepted that the ICDS programme design needs better implementation. The programme has been very useful to the rural households across the country, but there is a need of widespread coverage, proper administrative arrangements, increase in manpower, proper monitoring and supervision of the programme are the areas which need to be looked after (Tandon, 1989; Blatchford, 1994; Saxena and Srivastave, 2009, Balarajan and Reich, 2016).

Recent studies show that ICDS programme has positive and significant impact on the nutritional status of both boys and girls of rural India. The author emphasised that because of poor delivery of the programme benefits resulted in failure of ICDS in some states and it has no connection with feeding intervention process (Jain, 2015). Further, there is lack of proper coordination among the stakeholder of policy formation like government, academia, technocrats and bureaucrats and this resulted in the improvement in the existing scheme. But in the absence of new reform in the policy, the scheme at its present form is the best option to provide nutritional support to the beneficiaries (Balarajan and Reich, 2016).

#### *1.6.2 Food based welfare programmes in operation in Assam*

Various parts of Assam has faced food crisis at various point of time. Apart from general food inflation, certain factors worked as catalyst to create the condition of food crisis in the state.

##### *Assam's 'food crisis'*

Till 1970s, the food procurement and distribution system of Assam was largely in the hands of the private sector. In Assam, the 1970s has been documented by as a period of severe food shortages leading to starvation deaths (Baishya, 1975). Severe food shortages were particularly seen in the districts of Dhubri, Goalpara, Barpeta and Kamrup. Food scarcity and starvation was very high in Mangaldoi, Goalpara, Nagaon and Garo Hills. Supply of foodgrain was inadequate and public distribution system of the state failed to meet the demand (EPW, 1968). Famine was declared by district administration in the undivided districts of Dhubri and Goalpara. The Muslim population dominated areas were the worst hit in this famine. The state government machinery was blamed for not intervening timely and letting a food shortages situation into a crisis (Rangaswamy, 1975). Thus food crisis of the 1970s in Assam were a clear case of failure of exchange entitlements.

As (Prabhakar, 1974) mentions an above of thousand death cases out of starvation were reported in Barpeta district and majority of the death reports were from East Bengal origin Muslim inhabited regions. From Dhubri district, enormous number of deaths was reported from Golakganj, Panbari and Fakirganj areas. Considering the magnitude and severity of the crisis, the condition was reported as 'Famine' (Prabhakar, 1974). In that time period, distribution of foodgrain in the market was handled mostly by private wholesalers and retailers rather than state run cooperatives or panchayats. Between 1973 and 1974, the consumer price index of rice had risen by more than 65 per cent, which was mostly a result of speculation in the market due to hoardings by private traders (Baishya, 1975).

*Prevalence of scarcity amidst plenty in the state since 1940's to 1970's*

The political unrest at the international level and recurrent natural calamities had adversely affected the normal life of the people of the state and created food crisis at different time intervals after World War II to till 1970's. After Bengal famine of 1943 western Assam also faced problem of food scarcity and in its backdrop the villages of western Assam had faced 'food riots' where peasants broken the granaries of landlords and distributed among the small peasants. The main reasons for such crisis can be traced as general shock after war, severe floods and complex disputes among peasants and landlords (Saikia, 2014). Though there were shortage of food in most of the states but the seller group was benefitted from the price rise (*ibid*). As per the records of Government of India, in 1953-54 and 1954-55 there was plenty of food production but scarcity condition arose in many parts of the country like Bombay, Andhra Pradesh, Madras, Madhya Pradesh and Rajasthan due to severe draught. Assam, West Bengal and eastern part of Uttar Pradesh had devastating flood due to which there was problem in accessing food (Chopra, 1981).

In this period of time the Government of India failed to meet the food demand of this food insecure state as there was no buffer stock facility in the country (Chopra, 1981). It was only after 1965, major organisational changes happened in country including establishment of Agricultural Price Commission (later on named as Commission for Agricultural Costs and Prices and food Corporation of India in 1965. But no exceptional evidence was found during the crisis of 1970's. For the government of India the year of 1971 was a year of improvement in food situation in the country. However in this period itself scarcity condition prevailed with drought in 72 districts of the country including Assam, Maharashtra, Andhra Pradesh and Mysore. There was additional pressure of Bangladeshi refugee on the available food supply in the state of Assam. Despite knowing the burden of population growth the Government of India has not released extra amount of foodgrain to the state (*ibid*).

#### *Food Policies of the state, 1940 to 2000*

The food policy of Assam can be widely classified into supply based programmes and demand based programmes. The programmes under supply based policies aimed at increasing the production of crops.

There are very few published studies reflecting upon the state of food distribution or the food policy of the state of Assam between the period 1970s- 1990s. However, among them, some studies on targeted PDS which can be summarized as follows. Sengupta (2006) studied the effectiveness of targeted PDS in Silchar district of Assam in which she mainly focused on coverage of target population. Her finding was that while 80 per cent of BPL households had access to PDS commodities (rice, sugar and kerosene oil), there was still a heavy dependence of households on the open market to meet food requirements. Some 30 per cent of the households in Silchar self-selected themselves against participating in the

PDS due to inferior quality of rice available through the retail outlets. Other problems highlighted in the Sengupta (2006) study are: lack of information among the household regarding PDS entitlements, bureaucratic hassles in getting family identity cards or ration cards, and corruption at various levels of administration.

A study of targeted PDS is seen in Priyadarshini (2006) which has focused on higher prices of PDS foodgrains compared to the open market price. This has led to the withdrawal of consumers from the system of PDS. Assam's contribution to the nation's buffer stocks has also been negligible since the middle of 1990s. Other problems noted are that of low coverage in terms of spread of ration shops, bad quality of foodgrains stocked in ration shops, and very high costs of transportation which adds to the already crippled state of PDS in Assam.

We have seen that in terms of production, Assam is a food deficit state. Some of the problems specific to Assam as mentioned by Hussain (2004) are increasing land-man ratio, increasing number of internally displaced people, severe floods and land erosion in the Brahmaputra and Barak valley. Some of the most vulnerable groups are said to be the small peasant households, displaced persons in relief camps and plantation workers. An effective implementation of food and nutrition programmes in Assam is thus a necessity.

### *1.7 THE RESEARCH OBJECTIVES AND QUESTIONS*

The NSSO estimates show that poverty rates in Assam stagnated in the 1990s and early 2000s, and have increased in the late 2000s. Assam is a severely food deficit state of India and the per capita availability of cereals is much below the recommended ICMR norms. Nutrition indicators (energy intake adequacy, infant mortality rates, protein calorie adequacy, anemia among women and children) show that Assam's food security status has worsened in the recent years. Between 1999-2000 and 2007-08, the per capita net state domestic

product (at 1999-2000 prices) has grown by only 2.8 per cent (Government of Assam, 2008-09).

Some of the latest available data show that between 2004-05 and 2006-07, growth rate of tax revenues of the state have been declining, even registering a negative growth rate between 2006-07 and 2007-08 (34 per cent in 2004-05, 18.09 per cent in 2005-06, 8.14 per cent in 2006-07 and -2.72 per cent in 2007-08). Historically Assam has always been a low growth state. The gross state domestic product (GSDP) of Assam has grown at the rate of only 3.3 per cent during the period 1980-2001 (GOI, 2002). This is in sharp contrast to growth rates registered in other parts of India (the now 'poorest' state Odisha was growing at 4.8 per cent between 1980-81 and 2006-07). The GSDP of Assam between 1999-2000 and 2007-08 (at 1999-2000 constant prices) is estimated at 4.4 per cent (Government of Assam, 2008-09).

Thus, Assam's low growth rates, increasing poverty ratios, and increased food insecure conditions gives me a justification to study the state of food insecurity of the state. It is well established that food based welfare programmes contribute massively to the state of calorie poverty existing in our country, and particularly the rural areas. It is in this context that I propose to study how food based welfare programmes contribute to the state of food security of the people in rural Assam.

Through this study, I have focused on the following research objectives:

**Research Objective 1:** Following the World Food Programme framework of food security assessment at sub-regional levels, to study the food security situation among the districts of Assam.

- A. How do the districts rank based on the indicators of food availability, food accessibility and food absorption?

- B. Can we group the districts based upon their vulnerability in each of the food security indicators?

**Research objective 2:** To inquire into the implementation and performance of the major central and state government sponsored food based welfare programmes in rural Assam.

- A. What has been the nature of the policy of Public Distribution System in Assam since its inception in 1940s?
- B. What are the changes in quantity and price entitlements of PDS rice over the period of 1990s and 2000s?
- C. How has targeted PDS performed in Assam since 1997? Does targeting differ geographically across Assam? Are there inefficiencies in the way targeting has been followed?
- D. Have food based welfare programmes (such as PDS, MDM and ICDS) contributed to household food security?
- E. What is the state of infrastructural arrangements at the village level in so far as the operation of MDM and ICDS is concerned?

### *1.8 METHODOLOGY OF THE STUDY*

The study has been carried out through both secondary and primary data analysis. Extensive review of literature has been carried out for understanding the food policy of Assam. A review of food policy of Assam has been done in the larger context of the food policy of the Indian Union. Through this thesis, I have focused on the contribution of three food based welfare programmes – the Public Distribution System, the Integrated Child Development Scheme and the Mid Day Meal Programme – on household food security, for which I have carried detailed household level survey in two districts of Assam.

## 1.9 DATA SOURCES AND CHAPTER OUTLINE

<b>Secondary source, Government of Assam</b>	
Internal records	Department of Food, Civil Supply and Consumer Affairs , 2010
Economic Survey of Assam	Directorate of Economics and Statistics, Planning and Development Department , 2004-05 to 2010-11
Statistical Handbook of Assam	2008-09 to 2010-2011
District wise BPL population in rural Assam	Department of Panchayat and Rural Development, GoA, available in <a href="http://pnrdassam.nic.in/bpllist.html">http://pnrdassam.nic.in/bpllist.html</a>
<b>Secondary source, Government of India</b>	
Primary Census Abstract	Registrar General of Census of India, 2001 and 2011
Annual Health Survey	,2010-2011
CIP price of rice	Indiastat.com
Level and Pattern of Consumer Expenditure	NSSO, 50th round(1993-94), 55th round (1999-2000), 61st round (2003-04), 66th round (2009-2010)
Reported Adequacy of Food Intake in India, 1999-2000	NSSO, 55th round (1999-2000) Ministry of Statistics and Programme Implementation
Perceived Adequacy of Food Consumption in Indian Households,	NSSO, 61st round (2004-05) Ministry of Statistics and Programme Implementation
Perceived Adequacy of Food Consumption in Indian Households	NSSO, 66st round (2009-2010) Ministry of Statistics and Programme Implementation
Public Distribution System and Other Sources of Household Consumption	NSSO, 61st round (2004-05) Ministry of Statistics and Programme Implementation
Public Distribution System and Other Sources of Household Consumption	NSSO, 66st round (2009-2010) Ministry of Statistics and Programme Implementation
<b>Primary data</b>	
Detailed sample survey of rural households	Based on structured and close ended interview schedule

Some of the major sources of secondary data on which I have relied on are: the State Directorate of Economics and Statistics, the Consumer Expenditure Round reports of the National Sample Survey Organization, Population Estimates of the Census of India, Nutrition and Health estimates emanating from the National Family Health Survey,

National Institute of Nutrition and the Indian Council of Medical Research. Data analysis is largely based on cross-section. Descriptive statistics, regression analysis and exploratory data analysis have been carried out based on data needs.

### **Chapter 1: Introduction and review of literature**

**Chapter 2: Food insecurity in rural Assam: A district level analysis** ranks the districts of Assam according to the level of food security based on the CFSVA-baseline framework of WFP.

**Chapter 3: The study area and profile of the village** describes the location of the study area and brings out the differences in socio-economic characteristics of both the villages. This chapter also discusses the sample design.

**Chapter 4: The functioning of Targeted Public Distribution System in rural Assam** explains the functioning of the public distribution system of Assam. The main focus of this chapter is the fixation of state issue price of PDS rice and differential prices charged for foodgrains in the state based on geographical locations.

**Chapter 5: Socio-economic composition of households excluded from TPDS: Errors of exclusion in the study villages** measures the level of inclusion and exclusion errors in Chaudhurirchar and Kumargaon revenue village based on identification and possessions of ration cards.

**Chapter 6: Role of Targeted PDS in ensuring household cereal consumption needs: A cross section analysis** examines how PDS has been responding to the need of the rural households. This chapter studies in detail utilization of PDS rice in the study villages and throws up evidences of leakages due to multiple state issue prices. A pooled regression

analysis showing causation between household land holdings, consumption expenditure, ration card holdings and foodgrains consumption deviation from a norm is discussed.

**Chapter 7: Supplementary Nutrition Programmes: A case study of ICDS and MDM programmes in Assam** studies the demand for these two programmes in the study villages. This chapter also explains the problems associated with the implementation of these programmes. In the overall analysis this chapter finds that there is a heavy demand of supplementary nutrition programmes in the study villages.

**Chapter 8: In conclusion: rural households of Assam require continuous food based interventions** provides a commentary on the role and significance of food based welfare programmes in the survival of rural households. This chapter provides a brief summary of all chapters and concludes with observations on how demand for food based welfare programmes among rural households of Assam is extremely high and therefore needs continuous support.

## Chapter 2

### Food Insecurity in Rural Assam: A District Level Analysis

Assam is largely considered to be a food deficit State particularly in terms of production deficiency. In other words, Assam is not able to meet its own food consumption demand (MSSRF, 2001; 2008). Further as the head count ratio of poverty in rural Assam increased during the period of the 2000s (from 36.4 percent in 2004-05 to 39.9 in 2009-10, (GoI, 2012)), food security of the rural population deserves attention. In this context, this chapter carries a food security analysis of rural Assam, based on certain widely used food security indicators, at the district level. It is pertinent to note here that various frameworks of food security analyses have been carried out globally and nationally. However a disaggregated level study of food security, for e.g. at the district level, is significant in terms of policy attention and implementation programmes.

This chapter aims at generating district level ranks based on food security indicators following the framework of World Food Programme, which has pioneered food security mapping at various levels of aggregation (World Food Programme 2009; 2013).<sup>9</sup> One of the most important limitations of using the WFP framework at the district level is data availability for the indicators specified in such frameworks. However in spite of the limitations the WFP framework has been used for carrying out State level analysis in India

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<sup>9</sup>The WFP framework has been used for State level analysis of food security by various independent agencies but this chapter is mainly concerned with district level ranks and not mapping. A mapping goes beyond generating ranks as it involves detailed profiling of the food insecure regions with a focus on understanding the root causes of the problems that people face. Further a mapping also specifies different forms of interventions that may be carried out to overcome the problem areas. However the objective of this chapter is not to engage in detailed profiling of the food insecure districts but only to specify their status with respect to the indicators. Moreover there are limitations of data availability at the district level that does not allow a comprehensive mapping exercise at the district level. For a detailed analysis of tools of mapping, see World Food Programme (2009).

(see for e.g. MSSRF, 2001; 2008; World Food Programme and Institute for Human Development, 2008; 2010).

The aim of this chapter is twofold. Firstly, district level ranks will provide an overall picture of performance of districts based on their food security status. Further since selected indicators have been studied it will also bring out performance of the districts based upon select food security indicators thus indicating areas where interventions may be required. Secondly, the district level ranks will provide a roadmap for the methodology of carrying out a cross section study of households that has been attempted through this thesis. An agro-ecological zone classification has been followed to rank the districts as spatial characteristics influence the food security status of a region.

This chapter has four sections. Section 2.1 discusses the literature on food security assessment frameworks. Section 2.2 outlines the methodologies followed by the independent agencies in India that have carried out State level food security mapping. Section 2.3 elaborates on the district level ranking exercise that I have carried out and Section 2.4 summarizes and concludes the discussion.

### *2.1. FOOD SECURITY ASSESSMENTS CARRIED OUT WORLDWIDE*

The World Food Programme (WFP) came into existence as an independent agency at the initiative of the Food and Agricultural Organisation (FAO) and the UN General Assembly in November/December 1961 and started operations in January 1963. The first set of operations began in the form of food assistance to the people of earthquake hit Iran, hurricane affected people of Thailand and five million returning refugees of newly independent Algeria. Thus, WFP acted as a frontline agency to provide food assistance to people affected from emergencies like war, civil conflict and natural disaster. Over the years

the main aim of WFP has been to combat the worldwide spread of hunger (especially in the least developed countries stretching to Sub-Saharan Africa, Middle East, Latin America and the Asia Pacific). It also promoted food- for- assets projects where people are provided food in return of work in construction of roads, wells and irrigation systems. School feeding projects, free food programme at health care clinics for pregnant women and pre-school going children were some of the other important initiatives (WFP, 2009, see <http://www1.wfp.org/country-capacity-strengthening>). For food assistance; WFP relies on voluntary contributions from governments all over the world, along with contributions from business enterprises and individuals (see <http://vam.wfp.org/>).

Being at the forefront of food assistance programme, the WFP also leads in terms of analytical frameworks in assessing food insecure conditions across the globe. A wide range of assessments are followed to identify the level of hunger and food insecurity in a country. Some of them include the Comprehensive Food Security and Vulnerability Analysis (CFSVA- Baseline), Crop and Food Security Assessment Mission (CFSAM), Emergency Food Security Assessment (EFSA), Food Security Monitoring System (FSMS), Joint Assessment Mission(JAM), Market Assessment and Bulletin (MAB) and Other Multi Agency Assessments. Among these assessments, CFSAMs, EFSA, JAMs are widely carried out during period of emergency. CFSVA-Baseline measures food security conditions during normal periods. All these assessments follow elaborate methods of mapping food insecurity at the household and community level. The guidelines of WFP neither make clear distinctions between these assessments nor prescribe strict guidelines about which country should follow which assessment method. However the country specific evidences show that they have used various combinations of different assessments. A brief summary of such assessments are provided below (see <http://vam.wfp.org/>).

### *Joint Assessment Missions (JAM)*

Joint Assessment Missions are carried out by WFP in collaboration with other agencies such as UN High Commissioner for Refugees, UN Office for the Coordination of Humanitarian Affairs, UN Development Programme and government and non-government organisations. The assessments are carried out to study food insecure conditions only in case of manmade or natural emergencies (UNHCR and WFP, 2008).

The JAM involves various stages. At first stage detailed initial assessments are undertaken where the refugees or internally displaced persons are located so that the operational plan and budgets of the assistance programme can be estimated. Second stage is Periodic reassessment of the ongoing activity. At this stage efforts are made to identify one durable solution so that the refugees can go back home. Third phase is in-depth analysis of food security of the people. Fourth phase is the process of repatriation and reintegration. Fifth phase is making a nutritional survey. Thus JAM is a combined initiative of various agencies to measure the level of food insecurity in a country (*ibid*).

### *Crop and Food Security Assessment Mission*

The Crop and Food Security Assessment Missions are increasingly used in countries where people's access to food and food supply has been affected due to various types of conflicts, poor governance, economic mismanagement or natural calamities. This framework analyses food security situation at two levels. At a micro level, assessments are done to find out if food can be sourced from local market or from foreign markets. Food shortfall is addressed through food assistance programmes. A roadmap is then prepared to meet national level deficits or local level deficits (FAO and WFP, 2009).

### *Emergency Food Security Assessment Mission*

This framework starts with collection of pre-crisis information, e.g. individual's main occupation before and after shock whether the person's occupation is hampered due to the shock; Is there any effect due to both sudden and slow onset of crisis like destruction of infrastructure, especially the stock of food which leads to increase in food prices and so on. Thus if the secondary data collected throws up outcomes such as mortality or nutritional deficiency then they need to be addressed immediately by collecting primary data from the affected regions. In primary data collection contextual information such as what are the nature of the crisis, what are the factors involved in the crisis, who are the most affected groups due to conflict, what are the direct and indirect effects of conflict on food and nutrition security and other political, institutional and social factors needs addressing (WFP and VAM, 2009).

Three key sets of indicators used to measure the dimensions of food security problem in EFSA are *Mortality rates*, *Nutrition indicators* (Mid Upper Arm Circumference or MUAC), *Food Security Indicators* which is measured by food consumption score (it is based on the number of food groups that a household consumes over a reference period of seven days). Along with that, the level of food frequency which is measured in terms of the number of days in which a particular food group is consumed over a reference period and the relative nutritional importance of different food groups is taken into consideration. Each food group is assigned weights reflecting its nutritional density. Thus FCS is calculated for each household by multiplying each food group frequency by each food group weight and the

scores are summed up to come up with a composite score. Sometimes, Coping Strategy Indices are also used as proxy indicators for measuring household food insecurity<sup>10</sup>

### *Market Analysis and Monitoring*

Market Analysis and Monitoring are used to provide critical information on functioning of markets. Though initial attempt was to integrate market analysis in EFSA, CFSVAs, FSMS and CFSAM, but with WFP's shift from food aid to food assistance, the attempt has shifted towards supporting market based interventions. The most common activity under this assessment method is to monitor the market price of food in order to understand the impact of food price hike on household food security. Following the global economic, financial and food crisis of 2008-09, WFP established an online food database covering almost 1000 markets in 70 countries across Latin America and Caribbean, North, South, Central, East and West Africa, Middle East and Asia. The information collected on trends of staple food prices are compiled as *The Market Monitor* which is used as a monitoring tool to analyse price volatility by government agencies, UN agencies, academia, international NGOs and other regional organisations. On the basis of trends in staple food and fuel prices, cost of basic food basket and consumer price indices of countries it lists out the "hotspots" of food price volatility (WFP and VAM, 2009).

### *The Comprehensive Food Security and Vulnerability Analysis*

The Comprehensive Food Security and Vulnerability Analysis provide in depth picture of food security situation during a normal year and also generate documents describing the status of food security of various segments of population in a region. It also analyses the causes of vulnerability and recommends appropriate interventions. This exercise is

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<sup>10</sup>See <https://www.wfp.org/content/food-consumption-score-nutritional-quality-analysis-fcs-n-technical-guidance-note> for a technical note on estimating food consumption score used for food security analysis at the household level (World Food Programme, 2009).

undertaken in collaboration with UN agencies, respective national governments and civil society organizations. CFSVA identifies regions of food insecurity by making use of secondary data, literature review, and qualitative information based on focus group discussions and primary quantitative data. This assessment framework emphasizes the need of a thorough literature survey and secondary data analysis to identify the data gap along with justification behind primary data collection in order to carry out a food security assessment. Primary data can be best complemented with secondary data, where such data are recent and of good quality. The finding of this framework usually covers the entire country and is valid upto five years (WFP and VAM, 2009; also see <http://vam.wfp.org/>).

The Food and Nutrition Security Conceptual Framework considers food availability, food accessibility and food absorption as core elements of food security (WFP, 2009). Starting with China in 2000, in its report of *China-Baseline Survey Nutrition Assessment* to most recent Yemen's- *Comprehensive Food Security Survey*, November 2014; this framework has been widely used in South Asian, Southeast Asian, African and most recently in Yemen, Egypt and Madagascar.

In India, the WFP and MSSRF had taken the first ever joint initiative of mapping food security situation in rural and urban areas, which comes under the CFSVA-baseline framework. The studies have been published as *Food Insecurity Atlas of Rural India* (2001); *Food Insecurity Atlas of Urban India* (2002), and *Atlas of the Sustainability of Food Security in India* (2004). An update of *Food Insecurity Atlas of Rural India* (2001) was published as *Report on the State of Food Insecurity in Rural India* in 2009. An updated version of FIAUI was published as *Report on the State of Food Insecurity in Urban India* (RSFIUI) in 2010. Following the same method, some Indian states have also attempted district level mapping of food insecurity. They are – *Food Security Atlas of Rural Bihar* (2008), *Food Security Atlas of Rural Chhattisgarh* (2008), *Food Security Atlas of Rural Jharkhand* (2008), *Food Security Atlas of Rural Maharashtra*

(2010) and *Food Security Atlas of Rural Odisha* (2008). All these reports are the outcome of joint initiative of Institute for Human Development, New Delhi and WFP.

The CFSVA- baseline guideline mentions both pre survey and post survey assessments while trying to map food security. The main aim of pre survey assessment is to identify the affected region with the help of secondary data. Though various steps have been mentioned to be followed in the post survey period, the most important are- computation of wealth index based on primary data with the use of Principal Component Analysis, creation of livelihood groups and computation of household food consumption score, inclusion of seasonal variations by considering the impact of variation of time of survey (e.g. peak or lean agricultural season) upon the final indicator, inclusion of large number of nutrition related indicators, and a thorough market analysis.

Thus CFSVA- baseline guidelines shows extensive analysis of measuring food insecurity looking at the diversified problems of large numbers of countries. It has mention about an exhaustive list of 47 indicators (see appendix table A2.1). However, a nation or state/region can choose indicators that are most relevant based on the level of disaggregation attempted. For example in Indian case, out of these 47 indicators, 19 indicators were used in FIARI-2001 and in successive reports; to map the level of food insecurity for the states.

## *2.2 MAPPING OF FOOD INSECURITY IN RURAL INDIA*

### *2.2.1. Mapping of food insecurity at the state level*

Unlike as mentioned in the CFSVA-guideline, the mapping of food insecurity in India has not been done on the basis of estimates on food consumption score and a wealth index; rather by constructing a food security index. The food security index is a composite index of different individual index which are again components of three dimensions of food

*Availability, Accessibility and Absorption.* *Availability* is a situation when there are adequate amount of food ready for people's consumption. *Accessibility* ensures when all households in a region and every member of household have sufficient resources to get food. *Utilisation* is most commonly discussed from a biological perspective, referring to ability of the human body to ingest food. It covers multiple aspects such as nutritious and safe diet, healthy biological and social environment and good health care services (FAO, 2000).

The individual index is calculated by following UNDP's range equalisation method. Composite index is a simple average of all individual indexes. On the basis of this composite index value, the states or districts are divided into five typologies of food insecurity. They are – *extremely food insecure, severely food insecure, moderately food insecure, moderately food secure and food secure states* (FIARI, 2001, 2008). Bihar was the only state categorized under the *extremely food insecure* category. Gujarat, Madhya Pradesh, Uttar Pradesh, Rajasthan and Odisha were the *severely food insecure* states. Assam was reported as *moderately food insecure* state along with West Bengal, Maharashtra, Andhra Pradesh, Karnataka and Haryana. Tamil Nadu and Kerala were *moderately secure* state. Himachal Pradesh and Punjab were the only two *food secure* states (FIARI, 2001).

In FIARI (2001), the districts are ranked according to its individual indicators in such a way that the state which performs best are given the highest rank of 16 and state which performs worst is given rank 1 when there are total 16 states. To assess the food availability status five indicators were used:(1) *deficit in cereals production* to measure deficit of consumption over production (2) *instability in cereal production* to measure factors like adverse effects of weather, pests, diseases etc. that leads to instability in yields (3) *sustainability index* is a composite index of five indicators like area not under forest to total geographical area, ground water exploitation, percentage of area under non-leguminous crop to total gross cropped area and

Table 2.1 *Indicators used in the FLARI, 2001 and ranking of rural Assam based on these indicators*

<i>Name of variable and description</i>	<i>Rank of Rural Assam</i>
<i>Food Availability</i>	
Deficit in cereal production, 1991-92 to 1993-94	5
Instability in cereal production, 1987-88 to 1997-98	13
Sustainability Index	12
Population affected by natural calamities, 1998-99	6
Percentage of drought prone area to total geographical area	11
<i>Food Accessibility</i>	
Calorie intake of the lowest decile	7
Percentage of population consuming less than 1890 Kcal	8
Percentage below poverty line	3
Percentage of population dependent on labour income	11
Rural Infrastructure Index	4
Juvenile sex ratio	15
Percentage of female literacy	11
Percentage of SC and ST population	15
<i>Food Absorption</i>	
Life expectancy at age one	1
Percentage of population with chronic energy deficiency	16
Percentage of severely stunted children (below age of five)	13
Percentage of children (below age of five)	2
Infant Mortality Rate	5
Health Infrastructure Index	3

*Source:* MSSRF, 2001

*Note:* The ranks are in a descending order, which means that best performance receives a higher number and the worst performances receive a lower number.

wasteland as a percentage of total geographical area and degraded land as a percentage of total geographical area (4) *population affected by natural calamities* especially floods and drought and (5) *proneness to drought conditions* to measure the most drought affected regions. Of the five indicators Assam received a low rank for indicators (1) and (4) and was ranked high for indicators (2), (3) and (5). Therefore Assam was mapped as a moderately food insecure state in the food availability dimension.

Accessibility implies all arrangements through which a household/individual can afford to have food. It also implies the bundle of entitlements of a person. Accessibility was measured by 8 indicators which represents deprivations. The indicators were: (1) *calorie intake of the lowest expenditure decile* measuring deficiency of diet from the norm (2) *percentage of population consuming less than 1890 kcal per capita per day* were considered as hungry because this is not as per the ICMR norm of food adequacy (3) *percentage below poverty line* to measure poverty through the official head count ratio of poverty (4) *percentage of population dependent on labour income* to measure 'casualisation' of labour (5) *rural infrastructure index* to measure rural connectivity (6) *juvenile sex ratio* to measure gender discrimination (7) *percentage of female literacy* to indicate women empowerment (8) *percentage of SC and ST population* to reflect state specific evidences that SC and ST household has lower consumption expenditure than other households. The indicators for accessibility dimension also placed rural Assam in 'moderately food insecure' state.

Food absorption implies the capacity of a person to assimilate consumed food for a healthy life. And this is possible only when the consumed food contains all the essential micronutrients. To measure food absorption, six indicators were used: (1) *Life expectancy at age one* to provide a long term effect where level of food security gets reflected in improvements in life expectancy (2) *percentage of population with chronic energy deficiency* to measure long term under nutrition and malnutrition among people (3) *percentage of severely stunted children (below age five)* to measure future health outcome of infants (4) *percentage of children (below age five)* to measure the required interventions for food security of children (5) *Infant mortality rate* to measure multiple outcomes such as lack of access to basic health facilities such as immunization, nutritional need of pregnant women, access to safe drinking water (6) *health infrastructure index* to measure access to basic health facilities. These are also known as outcome indicators of food security. The long term outcomes of food security get

reflected through these indicators. For example the indicator life expectancy at age one, not only depends upon one time food consumption but on literacy, knowledge of nutrition, access to health care facilities etc. Outcome indicators (food absorption dimension) show that Assam is one of the worst performer states. Therefore in the absorption dimension Assam is categorized as having ‘very high’ level of food insecurity. Table 2.2 shows the level of food insecurity for rural Assam for all indicators as per FIARI, 2008.

Table 2.2 *Level of food insecurity in rural Assam, 2004-06*

<i>Indicator</i>	<i>Value</i>	<i>Level of food insecurity</i>
Percentage of population consuming less than 1,890 Kcal/per consumer unit/ per day, 1993-94 to 2004-05	8.9	Low
Percentage of rural household not having access to safe drinking water, 2001	43.2	Moderate
Percentage of households not having access to toilets within the premises, 2001	40.43	Low
Percentage of ever married women (15-49 years) who are anemic, 2005-06	69.5	Very high
Percentage of women (15-49 years) with CED, 2005-06	39.5	Low
Percentage of children in the age group of 6-35 months who are anemic, 2005-06	77.4	High
Percentage of rural children in the age group 6-35 months who are stunted, 2005-06	35.5	Low
Overall level of food insecurity		Moderate

*Source:* MSSRF and WFP, 2008

*Note:* The first three are input indicators and the last four are output indicators.

According to FIARI (2008), Assam continues to be a ‘moderately food insecure’ state in 2004-06 along with states of Haryana, Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal. . The states with very low level of food insecurity are Punjab, Himachal Pradesh and Kerala, Jammu and Kashmir has low level of food insecurity, Andhra Pradesh, Bihar, Gujarat, Karnataka, Madhya Pradesh, Maharashtra and Odisha ‘high’ level of food insecurity and Chhattisgarh and Jharkhand had ‘very high’ level of food insecurity.

FIARI 2008 has followed a different method than FIARI 2001 and also decreased the number of indicators from 19 to 7. The report used seven indicators where first three are

input indicators and last four are outcome indicators. More emphasis was given on outcome indicators as they were identified as being the most appropriate for measuring food insecurity (MSSRF, 2008). Also, instead of ranking direct mapping of food insecurity was done for each indicator by constructing an index based on UNDP's range equalization method and level of food insecurity was measured for each indicator by state.

### *2.2.2 Mapping of food insecurity for five Indian states*

The district level mapping of food insecurity has been carried out following the same method as state level mapping done by FIARI (2001, 2008). However, the final Food Security Index which is a composite index was constructed by the method of principal component analysis<sup>11</sup>. Based on food security index values the districts are also divided into five typologies: extremely insecure, severely insecure, moderately insecure, moderately secure and secure. The indicators selected for district level mapping was slightly different from that used in state level mapping. While selecting indicators for district level mapping of food security, 3 availability, 6 accessibility, and 2 utilisation indicators were selected.

The indicators under availability dimension for the district level analysis were not the same as used by FIARI for the states. At the district level, the availability indicators were: extent of irrigation, per capita value of agricultural production and access to paved road. Irrigation plays a key role in increasing and stabilizing agricultural production and positively associated with food security. Per capita value of agricultural production is used to reflect the variations of population across districts of a state. Access to paved road shows the position of rural connectivity which will help the farmers to get the appropriate price of their product.

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<sup>11</sup>Principal Component Analysis (PCA) is a data reduction technique which is applied when there are large number of variables and if the variables are highly correlated. Through PCA analysis original data set is converted into new dataset of uncorrelated variables. Use of this method in construction of food security index are discussed in the "Appendix II: Food Security Index (FSI) – A methodological Note" of all the reports of Food Security Atlases pertaining to different states.

Table 2.3 *Indicators and data sources used by Food Insecurity Atlases of rural Bihar (2008), Chhattisgarh (2008), Jharkhand (2008) Maharashtra (2010) and Odisha (2008)*

<i>Name of variable and description</i>	<i>Data sources</i>
<i>Availability</i>	
Proportion of net irrigated area to net sown area, 1998-99	Department of Planning/ Agriculture of the state government
Per capita value of agricultural output, 1997-98 to 1999-2000	Department of Planning/ Agriculture of the state government
Percentage of inhabited villages having access to paved roads, 2001	Registrar General of Census of India
<i>Accessibility</i>	
Percentage of agricultural labourers (main and marginal) to total workers, 2001	Registrar General of Census of India
Proportion of ST and SC population to total population, 2001	Registrar General of Census of India
Non-Dependency ratio, 2001	Registrar General of Census of India
Per capita monthly consumption expenditure (inequality adjusted), 2004-05	NSS 61 <sup>st</sup> Round
Rural casual wage rate( average daily wage rate for the age group 15-59), 2004-05	NSS 61 <sup>st</sup> Round
Women's literacy rate (7+). Total female literate as	Registrar General of Census of
<i>Utilisation</i>	
Percentage of households having access to safe drinking water, 2001	Registrar General of Census of India
Percentage of inhabited villages having access to PHC (PHC facility within the village or within 5 km from the village), 2001	Registrar General of Census of India

*Source:* WFP and IHD (2008, 2010)

Similarly for accessibility, 4 different indicators were incorporated. They are non-dependency ratio, per capita consumption expenditure, rural female literacy rate and wage rate of rural labourers. Lower non-dependent population means higher food security as more people are expected to become productive. Per capita consumption expenditure is used as a proxy of per capita income which can indicate capacity of access to food. Higher female literacy means lower discrimination in accessing food between male and female at the household level. Wage rate of the rural labourers mainly tries to show the earnings of the

casual labourers both in agricultural and non-agricultural sectors. The 2 indicators used to measure utilisation were access to safe drinking water and access to primary health services which reflects that food security is a condition or outcome of a long time investment in health sector.

### 2.3 MAPPING OF FOOD INSECURITY AT DISTRICT LEVEL FOR RURAL ASSAM

For district level ranking data availability is one of the major constraints.<sup>12</sup>I have considered all the three dimensions of food security. However only six indicators, across all dimensions has been taken up due to data limitations. The indicators selected for district level mapping for Assam are adopted from Bedamatta (2010). Unlike the food insecurity atlases, this study does not aim at construction of composite index and dividing the districts in different typologies of food insecurity. Districts are ranked according to the individual indicators. And finally a comparison of all districts based on all indicators is being done. The districts are first ranked according to the values of the indicators. To do a food security analysis the districts are first grouped into agro climatic zone classification.

#### *Classification of districts: Based on Agro Climatic Zone*

Serial	Zone name	Districts
1	North Bank Plains(NBP)	Udalguri, Lakhimpur, Dhemaji, Darrang,
2	Upper Brahmaputra Valley (UBV)	Tinsukia, Dibrugarh, Sivsagar, Jorhat, Golaghat
3	Central Brahmaputra Valley(CBV)	Nagaon, Morigaon
4	Lower Brahmaputra Valley(LBV)	Kamrup(R+M), Goalpara, Dhubri, Kokrajhar, Bongaigaon, Nalbari, Barpeta, Chirang, Baksa
5	Barak Valley(BV)	Cachar, Karimganj, Hailakandi
6	Hills(H)	Karbi Anglong, Dima Hasao

There are six agro-climatic zones in Assam. Soil type of North Bank Plain is alluvial which is suitable for paddy cultivation and combination of both acidic and non acidic soil. Upper

<sup>12</sup>Districts considered for ranking has been discussed in the following section.

Brahmaputra valley has comparatively higher rainfall and more humidity and it has also alluvial soil. Though paddy and tea are major cultivated crops but rubber, jute, pulses and orange pineapple are also cultivated. Central Brahmaputra valley has also alluvial and acidic soil for which paddy and jute are main cultivated crops. This zone has lower rainfall as compared to other plain areas. Lower Brahmaputra zone has new alluvium and sandy soil on both the banks of Brahmaputra and old alluvium soil towards the foothills. Mostly cultivated crop in this zone are paddy, sugarcane, wheat, oilseeds like mustard, pulses and winter vegetables. Barak valley is predominated by hills and hillocks and it has mostly red loamy soil. Wheat, maize, paddy, potato, sweet potato, sugarcane, cotton and tobacco are cultivated in this region. Soil type of hill zone is lateritic and red loamy soil which is suitable for maize, pineapple, mustard and banana.

### *2.3.1. Geographical division of districts of Assam:*

Since the time of Indian Independence till 1960-61 Assam had ten districts. They were Goalpara, Kamrup, Darrang, Nagaon, Sivsagar, Lakhimpur, Dibrugarh, Cachar, K. Anglong and N.C. Hills. Most of the districts were separated from its original districts after 1980. Dhubri, Kokrajhar and Bongaigaon districts were the part of Goalpara district which got recognition of independent districts in 1983-84, 1983 and 1989. Barpeta and Nalbari was originally part of Kamrup district which were separated in 1983 and 1985. Sonitpur was separated from Darrang district in 1983. Jorhat and Golaghat were part of Sivsagar district which got separated in 1983 and in 1987. Karimganj and Hailakandi separated from Cachar district in 1983 and 1989. Dhemaji was separated from Lakhimpur district in 1989. Tinsukia was also a part of Dibrugarh till October 1989. Later on after 2000, five new districts were formed. Among them three districts were created under Bodoland Territorial Area District in 2004. They are Baksa, Chirang and Udalguri. Till June 2004, Chirang was within Bongaigaon and Udalguri was the part of Darrang districts. Kamrup was divided into

Kamrup (Rural) and Kamrup (Metro) in 2003. For the purpose of district ranks I have considered 22 districts and I have excluded Kamrup (Rural) Kamrup (Metro), Baksa, Chirang and Udalguri as data was not consistently available for all indicators.

Table 2.4 *Division of districts in Assam*

Districts from 1947-1960-61	Districts created during 1980's	Districts created during 2000s
Goalpara	Kokrajhar(1983)	Chirang (2004)
Kamrup	Dhubri(1983-84)	Baksa (2004)
Darrang	Bongaigaon(1989)	Kamrup(Metro)(2003)
KarbiAnglong	Barpeta(1983)	Udalguri(2004)
Nagaon	Nalbari(1985)	
Dibrugarh	Sonitpur(1983)	
Sivsagar	Jorhat(1983)	
Lakhimpur	Golaghat(1987)	
Cachar	Karimganj(1983)	
N.C. Hills (renamed as Dima Hasao in 2011)	Hailakandi(1989)	
	Tinsukia(1989)	
	Dhemaji(1989)	

Source: <http://www.assam.gov.in/web/guest/districts>

### 2.3.2. Indicators used for the district level mapping of food security in rural Assam:

Table 2.5 shows the indicators used for the current district level ranking for the state of Assam and the data sources and reference year relating to those data. Total 6 indicators have been used for ranking the districts. For food availability one indicator has been used, for food accessibility three indicators has been used and for food utilisation two indicators has been used. The indicators were chosen keeping in mind the consistency of data available at the district level. The dimensions and indicators have been adapted from the State level atlases on food security constructed by the MSSRF and IHD following the CFSVA framework of WFP.

Table 2.5 *Indicators used in the district level food security analysis of Assam*

<i>Food Availability</i>	
<i>Indicators</i>	<i>Data Source</i>
Per capita net cereal production	Statistical Handbook of Assam, GoA, 2008-09 to 2010-2011; Registrar General of Census of India, 2011
<i>Food Accessibility</i>	
Percentage of BPL households to total rural households	Data source: BPL data available in <a href="http://pnrdassam.nic.in/bpllist.html">http://pnrdassam.nic.in/bpllist.html</a>
Per Capita Net District Domestic Product at 1999-2000 constant price	Statistical Handbook of Assam, 2009
Percentage of Agricultural labourer to total workers in rural areas	Registrar General of Census of India, 2011
<i>Food Absorption</i>	
Under Five Mortality Rate (U5MR) - 2007-2009 in rural areas.	Annual Health Survey, 2010-11, Registrar General and Census of India.
Access to safe drinking water-2007-09 in rural areas	Annual Health Survey, 2010-2011, Registrar General and Census of India.

### 2.3.3 *Food security at the district level*

#### *Food Availability*

##### *a) Per capita per day net cereal production (in grams) for TE 2008-09 to 2010-11*

This indicator shows the availability of food at the district level. More production is assumed to be positively related with food security. The district with higher value of per capita cereal production per day is given higher rank. Karbi Anglong district has the highest value of per capita per day cereal production and therefore is the best performing district whereas Dhubri district has the lowest value and therefore is the worst performing district. Nagaon district emerges as an outlier in this case. Districts below the median average, apart from Dhubri are Tinsukia, Dibrugarh, Dhemaji, Bongaigaon, Karimganj, Cachar, Sonitpur, Lakhimpur, Dima Hasao and Barpeta. Most of the below median districts are heavily floods and erosion affected in Assam.

Per capita availability of cereals for consumption may also be seen in light of the fact that Assam is a food deficit state, and instability in cereals production directly affects food available for self-consumption at the household level.

Table 2.6 *Per capita per day net cereal production in Assam*

<i>District</i>	<i>Per capita per day net cereal production (in gms) TE 2008-09 to 2010-2011</i>	<i>Rank</i>
Dhubri (LBV)	244.5	1
Tinsukia (UBV)	247.9	2
Dibrugarh (UBV)	306.4	3
Dhemaji (UBV)	306.9	4
Bongaigaon(LBV)	326.9	5
Karimganj (BV)	331.7	6
Cachar (BV)	353.6	7
Sonitpur (NBP)	362.5	8
Lakhimpur (UBV)	383.6	9
Dima Hasao (H)	386.1	10
Barpeta (LBV)	390	11
Darrang (NBP)	398.6	12
Hailakandi (BV)	407.8	13
Morigaon (CBV)	415.3	14
Kokrajhar(LBV)	419.2	15
Goalpara (LBV)	419.2	15
Jorhat(UBV)	426.4	17
Nalbari (LBV)	465.8	18
Golaghat (UBV)	472.8	19
Sivsagar (UBV)	506.4	20
Karbi Anglong (H)	612.5	21
Nagaon (CBV)	1165.3	22

*Source:* Government of Assam (2009, 2010, 2011). The net cereals production data is the average for triennium ending 2010-11.

*Note:* Rank 1 is given to the worst performer district and Rank 22 to the best. The ranks are therefore descending in order.

#### *Food accessibility*

Three income related indicators are used to depict the picture of food accessibility. They are: per capita net district domestic product, percentage of BPL households to total rural households and percentage of agricultural labour household.

- a) *Per capita Net District Domestic Product (NDDP) (in Rs), 2007-08:* Income is main medium to access food. Inequality in income distribution has negative impact on nutrition level.

Therefore, districts with higher NDDP values are considered as better than that of with lower values of NDDP. Kamrup (M) has the highest value of NDDP whereas Dhubri has the lowest value of NDDP. The top five ranked districts mostly belong to Upper Brahmaputra Valley i.e. Sivsagar, Jorhat, Dibrugarh and Tinsukia and the hill district of Dima Hasao. Other districts with lower levels of income are Nagaon, Dhemaji, Barpeta, Goalpara and Sonitpur.

Table 2.7 Per capita Net District Domestic Product (NDDP) (in Rs) at 1999-2000

District	NDDP per capita	Rank
Dhubri (LBV)	9077	1
Nagaon (CBV)	10252	2
Dhemaji (UBV)	11160	3
Barpeta (LBV)	12202	4
Goalpara (LBV)	12831	5
Sonitpur (NBP)	13001	6
Lakhimpur (UBV)	13179	7
Hailakandi (BV)	14217	8
Cachar (BV)	14789	9
Morigaon (CBV)	14804	10
Karimganj (BV)	15127	11
Darrang (NBP)	16097	12
Nalbari (LBV)	16457	13
Kokrajhar (LBV)	16559	14
Golaghat (UBV)	16882	15
Karbi Anglong (H)	16935	16
Bongaigaon (LBV)	21428	17
Tinsukia (UBV)	21668	18
Dibrugarh (UBV)	21744	19
Jorhat (UBV)	21845	20
Sivsagar (UBV)	23587	21
Dima Hasao (H)	24541	22

Source: Statistical Handbook of Assam, 2009

Note: Rank 1 is given to the worst performer district and Rank 22 to the best. The ranks are therefore descending in order

b) Percentage of BPL households to total rural households, 2011

Poverty is the main constraint in having access to food. Poorer households have more difficulty in accessing food than the richer households. Therefore, districts with lower number of BPL households to total rural households are considered to be more food secure than the districts with larger number of BPL households. The district with lowest value of BPL households is given rank one and districts with highest value of BPL

households given the last rank. Tinsukia district has the lowest number of BPL households whereas Nalbari district has the highest number of BPL households in rural areas. Other good performing districts for this indicator are Dibrugarh, Karbi Anglong, Karimganj, Hailakandi, Lakhimpur and Cachar. Other low performing districts are Bongaigaon, Darrang, Morigaon and Sonitpur.

Table 2.8 Percentage of BPL households to total rural households, 2011

<i>District</i>	<i>Percentage of BPL household</i>	<i>Rank</i>
Nalbari (LBV)	68.8	1
Bongaigaon(LBV)	62.1	2
Darrang (NBP)	62	3
Morigaon (CBV)	50	4
Sonitpur (NBP)	45.5	5
Kokrajhar (LBV)	40.7	6
Goalpara (LBV)	38.8	7
Dhubri (LBV)	38.4	8
Barpeta (LBV)	36.5	9
Golaghat (UBV)	35.9	10
Dhemaji (UBV)	35.1	11
Dima Hasao (H)	35	12
Nagaon (CBV)	34.3	13
Jorhat(UBV)	33.4	14
Sivsagar (UBV)	33.2	15
Lakhimpur (UBV)	32.8	16
Cachar (BV)	32.8	16
Hailakandi (BV)	32.3	18
Karbi Anglong (H)	29.7	19
Karimganj (BV)	29.7	19
Dibrugarh (UBV)	29.6	21
Tinsukia (UBV)	26.6	22

*Source:* Data source: BPL data available in <http://pnrdassam.nic.in/bpllist.html>

*Note:* Rank 1 is given to the worst performer district and Rank 22 to the best. The ranks are therefore descending in order

c) *Percentage of agricultural labor household, 2011*

Agricultural labourer household are poorest and more vulnerable to food insecurity in any particular rural set up in India. More agricultural labour household in the district means more people are vulnerable and are prone to food insecurity. Dhubri district has the highest number of agricultural labour households whereas Dhemaji district has

lowest number of agricultural labour households. For these indicators the top five good performing districts are Sivsagar, Lakhimpur, Tinsukia and Dima Hasao including Dhemaji. The top five districts among lowest performing districts are Darrang, Nagaon, Morigaon, Goalpara including Dhubri.

Table 2.9 District wise share of agricultural labourer to total worker in rural Assam, 2011

District	Share of Agricultural labourer to total worker	Rank
Dhubri (LBV)	28	1
Darrang (NBP)	27	2
Nagaon (CBV)	23	3
Morigaon (CBV)	23	3
Goalpara (LBV)	23	3
Bongaigaon (LBV)	21	6
Barpeta (LBV)	19	7
Karimganj (BV)	18	8
Kokrajhar (LBV)	18	8
Karbi Anglong (H)	17	10
Hailakandi (BV)	16	11
Sonitpur (NBP)	16	11
Golaghat (UBV)	15	13
Nalbari (LBV)	14	14
Dibrugarh (UBV)	13	15
Cachar (BV)	13	16
Jorhat (UBV)	12	17
Sivsagar (UBV)	11	18
Lakhimpur (NBP)	11	19
Tinsukia (UBV)	10	20
Dima Hasao (H)	7	21
Dhemaji (UBV)	6	22

Source: Registrar General of Census of India, 2011

Note: Rank 1 is given to the worst performer district and Rank 22 to the best. The ranks are therefore descending in order

### *Food Absorption*

Two indicators are used for food absorption: Under Five Mortality Rate and percentage of households having access to safe drinking water.

**Under Five Mortality Rate** is the probability of dying between birth and exactly five years of age expressed per thousand live births. U5MR reflects the food insecurity status of a region over a long period of time. Because high U5MR in a region means that region is suffering from deprivation of food, healthcare, education and other functionings for a long period of time.

Table 2.10 *District wise Under Five Mortality Rate (U5MR) in rural Assam, 2010-11*

<i>District</i>	<i>U5MR</i>	<i>Rank</i>
Kokrajhar(LBV)	103	1
Morigaon (CBV)	93	2
Hailakandi (BV)	91	3
Dhubri (LBV)	91	3
Darrang (NBP)	90	5
Nalbari (LBV)	88	6
Nagaon (CBV)	86	7
Karimganj (BV)	83	8
Golaghat (UBV)	82	9
Sonitpur (NBP)	80	10
Sivsagar (UBV)	79	11
Cachar (BV)	79	11
Dima Hasao (H)	78	13
Karbi Anglong (H)	77	14
Goalpara (LBV)	74	15
Tinsukia (UBV)	74	15
Jorhat(UBV)	71	17
Dibrugarh (UBV)	71	17
Lakhimpur (UBV)	68	19
Bongaigaon(LBV)	68	19
Barpeta (LBV)	65	21
Dhemaji (UBV)	52	22

*Source:* Annual Health Survey, 2010-11, Registrar General and Census of India.

*Note:* Rank 1 is given to the worst performer district and Rank 22 to the best. The ranks are therefore descending in order

Table 2.10 shows that Kokrajhar district has the highest U5MR and Dhemaji has the lowest U5MR. For this indicator too, the five top ranked districts are Dibrugarh, Lakhimpur, Bongaigaon, and Barpeta and Dhemaji. The lowest five ranked districts are Morigaon, Hailakandi, Dhubri, and Darrang including Kokrajhar. Among top five best districts, three belong to the Upper Brahmaputra Valley region and two are from Lower Brahmaputra Valley region and most of the districts for this UBV region show well performance for this indicator.

**Percentage of households having access to safe drinking water, 2007-08** Household water source is a significant indicator as when households do not consume safe drinking water, it might cause the various water borne diseases which ultimately has adverse impact on health and nutrition standard of the household.

It is observed that Dhubri district has lowest percentage of households with safe drinking water facilities in rural areas, whereas, Jorhat has the highest percentage of rural households with access to safe drinking water facility. For this indicator top five best performing districts are Dima Hasao, Sivsagar, Dhemaji and Darrang including Jorhat. Top five low ranked districts are Goalpara, Morigaon, Bongaigaon, and Tinsukia and Dhubri. Most of the top five good performing districts are from UBV region, Hill region and NBP region whereas; the lowest performer districts are mostly from LBV region.

Table 2.11 *District wise percentage of households with safe drinking water facility, 2007-08*

<i>District</i>	<i>Households with safe drinking water(in per cent)</i>	<i>Rank</i>
Dhubri (LBV)	7.1	1
Goalpara (LBV)	7.4	2
Morigaon(CBV)	11.2	3
Bongaigaon(LBV)	17	4
Tinsukia (UBV)	18.9	5
Kokrajhar (LBV)	19	6
Karimganj (BV)	25.8	7
Nagaon (CBV)	29.6	8
Karbi Anglong (H)	29.9	9
Sonitpur (NBP)	33.7	10
Dibrugarh(UBV)	34.8	11
Barpeta (LBV)	35.9	12
Cachar (BV)	41.3	13
Golaghat (LBV)	46.5	14
Hailakandi (BV)	47.3	15
Lakhimpur(NBP)	50.3	16
Darrang (NBP)	50.7	17
Dhemaji (UBV)	55.1	18
Sivsagar (UBV)	58.7	19
Dima Hasao (H)	67.4	20
Jorhat (UBV)	67.7	21
Nalbari(LBV)	70.4	22

*Source:* Annual Health Survey, 2010-2011, Registrar General and Census of India..

*Note:* Rank 1 is given to the worst performer district and Rank 22 to the best. The ranks are therefore descending in order

#### 2.4 DISTRICT RANKS: ALL DIMENSIONS AND INDICATORS

Keeping in mind the limitations of data availability, and adapting to the WFP framework of food security assessment, this chapter looked at the food security status of the districts of rural Assam. The food dimensions and indicators were validated based on the state level assessments done for various states of India. Since the objective of this chapter was to come up with an overall assessment based on district ranks and select districts where further

probing on food based welfare programmes could be carried out, instead of constructing indices for a final ranking I have come up with cumulative ranks following the BORDA scoring method.<sup>13</sup>

The cumulative ranks show that Dhubri district ranked the lowest based on all the dimensions of food security. Jorhat district was ranked the best. Further, if we look at the individual ranks, Dhubri was ranked lowest in most of the food security indicators. Jorhat, though not the best performer in all the indicators, was placed relatively high (Table 2.12).

Figures 2.1, 2.2 and 2.3 show how the distribution of data points of the various food security indicators for the districts through a box-and-whisker plot diagrammatic representation. Each Boxplot shows the position of the districts for each indicator. However, no comparison between the districts can be done based on the Boxplot as the units of measurement for each indicator is different. For visual clarity, per capita net cereal production has shown in a different diagram. Boxplot shows the spread of dataset based on maximum, minimum, quartiles and outliers. The whisker of the boxplot shows the minimum and maximum values of the data.

The dataset is divided into four quartiles ranging from lowest value to the highest value of the data. The middle line of the box shows the median value and accordingly the deviation of the data from median can be identified.

For per capita net cereal production, the inter district variation is less, shown by the distance between upper whisker and lower whisker. The distribution of the data is negatively skewed.

Karbi Anglong and Nagaon are the two outlier district as the value lies outside the upper

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<sup>13</sup>BORDA count method was invented by French mathematician Jean- Charles De Borda where each districts is ranked by indicators separately where lowest indicator is ranked first and other ranks continue accordingly (Dasgupta and Weale, 1992, Noorbaksh, 1998 ).

whisker. For the indicator NDDP per capita, the district deviation is not very stark, and the distribution is negatively skewed as the mean is greater than that of median. For the indicator of percentage of BPL households, the distribution is negatively skewed, and there is moderate deviation among the districts and Darrang, Nalbari and Bongaigaon are the outlier district for this indicator. However, for the indicator, share of agricultural labourer, there is also not much deviation among the districts. Similar pattern holds true for U5MR. For the indicator of safe drinking water, the distribution is positively skewed and more districts are concentrated at the upper quantile. There is also moderate difference between upper end and lower end of the distribution.

There are two significant conclusions that emerge in the final analysis. First, indicator specific ranks show the variations in food security status across districts of rural Assam. Districts of Lower Brahmaputra Valley in Assam are relatively worse-off in the final ranks compared to all other districts. Secondly, if we look at the distributions in terms of their dispersion, the variability is not very spread out, which means that the differences in food insecurity is only a matter of degree. However few districts such as (Nalbari and Karbi Anglong) are shown as outliers in the indicator of availability and Darrang, Nalbari and Bongaigaon for the indicator of percentage of BPL households for the accessibility dimension.

Table 2.12 Cumulative ranks of districts based on BORDA ranking, Assam

District	Net cereals prod	NDDP per capita,	Proportion of BPL	Agricultural labourers	U5MR	safe drinking water	Total	BORDA rank
Dhubri	1	1	8	1	3	1	15	1
Tinsukia	2	18	22	20	15	5	82	16
Dibrugarh	3	19	21	15	17	11	86	17
Dhemaji	4	3	11	22	22	18	80	14
Bongaigaon	5	17	2	6	19	4	53	7
Karimganj	6	11	19	8	8	7	59	9
Cachar	7	9	16	12	11	13	68	11
Sonitpur	8	6	5	11	10	10	50	4
Lakhimpur	9	7	16	19	19	16	86	17
Dima Hasao	10	22	12	21	13	20	98	20
Barpeta	11	4	9	7	21	12	64	10
Darrang	12	12	3	2	5	17	51	6
Hailakandi	13	8	18	11	3	15	68	11
Morigaon	14	10	4	3	2	3	36	2
Kokrajhar	15	14	6	8	1	6	50	4
Goalpara	15	5	7	3	15	2	47	3
Jorhat	17	20	14	17	17	21	106	22
Nalbari	18	13	1	14	6	22	74	13
Golaghat	19	15	10	13	9	14	80	14
Sivsagar	20	21	15	18	11	19	104	21
Karbi Anglong	21	16	19	10	14	9	89	19
Nagaon	22	2	13	3	6	8	54	8

Source: Compiled from various tables in Chapter 2. BORDA ranks have been calculated by the author.

Figure 2.1 Boxplot and whisker diagram for availability indicator

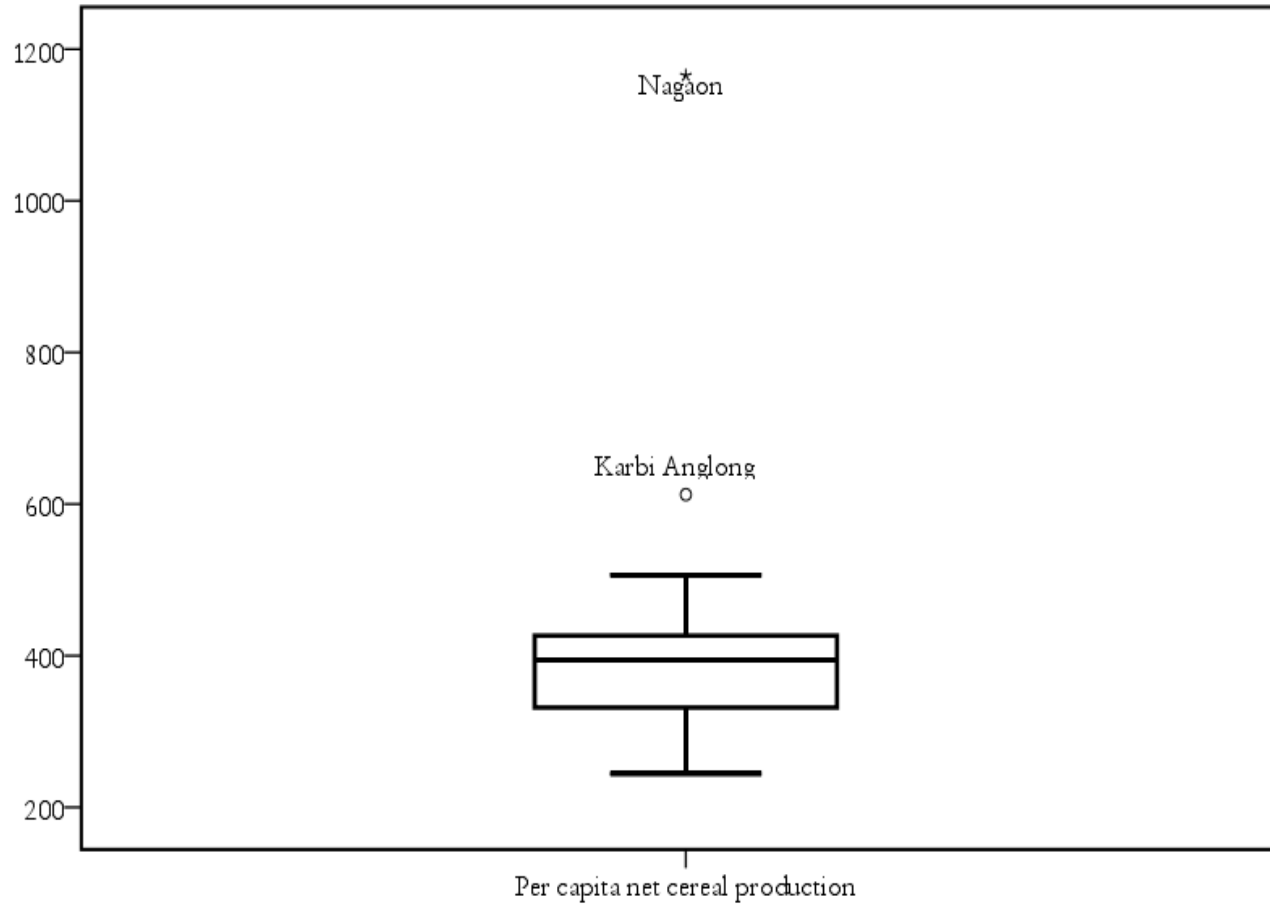


Figure 2.2 Boxplot and whisker diagram for accessibility indicator

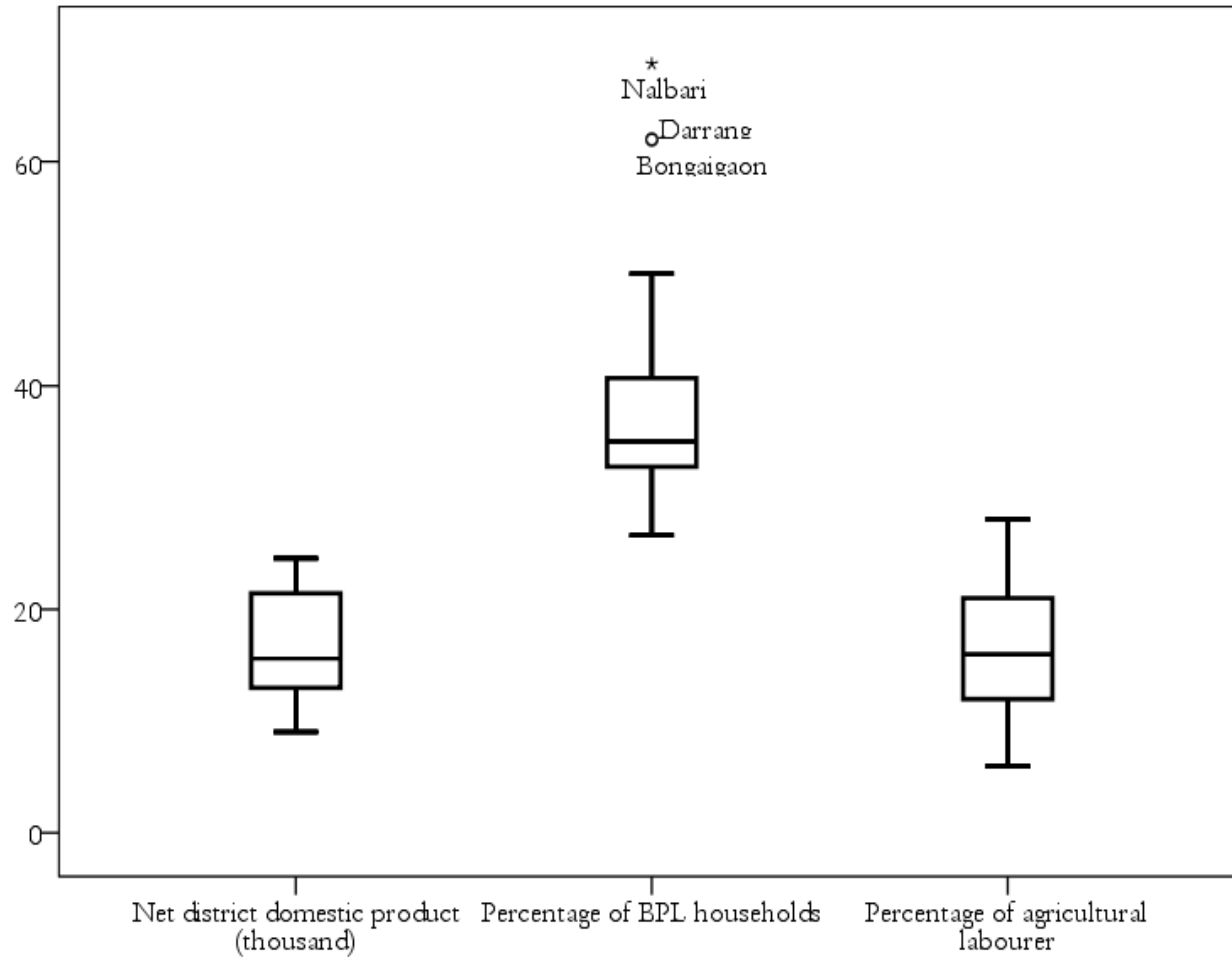
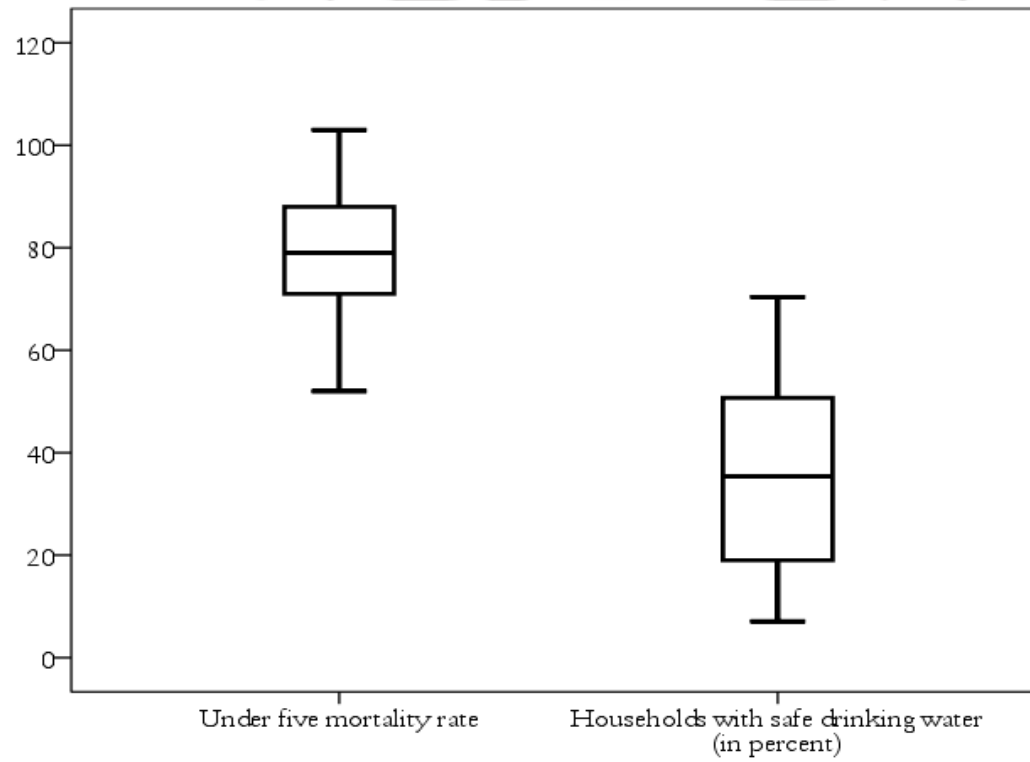


Figure 2.3 Boxplot and whisker diagram for absorption indicator



## Chapter 3

### The Study Area and Profile of Villages

This chapter discusses the method of selection of sample households. Geographical location and distinguishing socio-economic characteristics of the households in both sample villages are described, on the basis of census enumeration of the households. As discussed in chapter 2, the ranking of the districts based on WFP's three dimensions of availability, accessibility and absorption shows wide disparities in food security across the districts. The selected indicators of these dimensions show that Dhubri district ranked the relatively worst and Jorhat district ranked the relatively best. Therefore, to assess the performance of food based welfare programmes in Assam, Dhubri and Jorhat were selected.

The village survey in Chaudhurirchar revenue village (Dhubri district) and Kumargaon revenue village (Jorhat district) were carried out in 2015. A census enumeration of all households based on houselisting schedule followed by the sample survey was carried out in both the villages in May-June 2015 and November 2015 respectively. The unit of study is the household. I have used the Census of India definition of household, i.e. all members of households taking food from the same kitchen during the reference period under consideration.<sup>14</sup>

#### *3.1 METHOD OF SAMPLE SELECTION*

A multi stage sampling method was followed to conduct the village survey. The first stage involved selection of districts based on food security status following the WFP framework

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<sup>14</sup> The census definition of household is “a group of persons who normally live together and take their meals from a common kitchen unless the exigencies of work prevent any of them from doing so. Persons in a households may be related or unrelated or mix of both. However, if a group of unrelated persons live in a census house but do not take their meals from a common kitchen, then they are not constituent of a common household. Each such person should be treated as a separate household. The important link in finding out whether it is a household or not is if there is a common kitchen. There may be one member household, two member households or multi-member households” (Registrar General of Census of India, 2001).

as already explained in Chapter 2. The second stage was selection of community development blocks followed by selection of revenue villages from the block. In the final stage, households were selected following the method of simple random sampling without replacement.

I had various rounds of discussions with the district level officials of Directorates of Food, Civil Supply and Consumer Affairs (FCSCA) and Health Services to be able to identify the blocks and revenue villages where the household survey questionnaires could be administered. The FCSCA in both Dhubri and Jorhat provided me a list of model PDS villages where TPDS have been identified as being implemented successfully. However to be able to understand the shortcomings of TPDS functioning, instead of considering the model villages as my study area, I purposively decided to choose those areas which have been officially identified as having low health outcome indicators and therefore the need of food based welfare programmes can be considered as significant. For this purpose, I had further discussions with the Directorate of Health officials who could indicate me blocks and revenue villages where health outcome indicators are low.

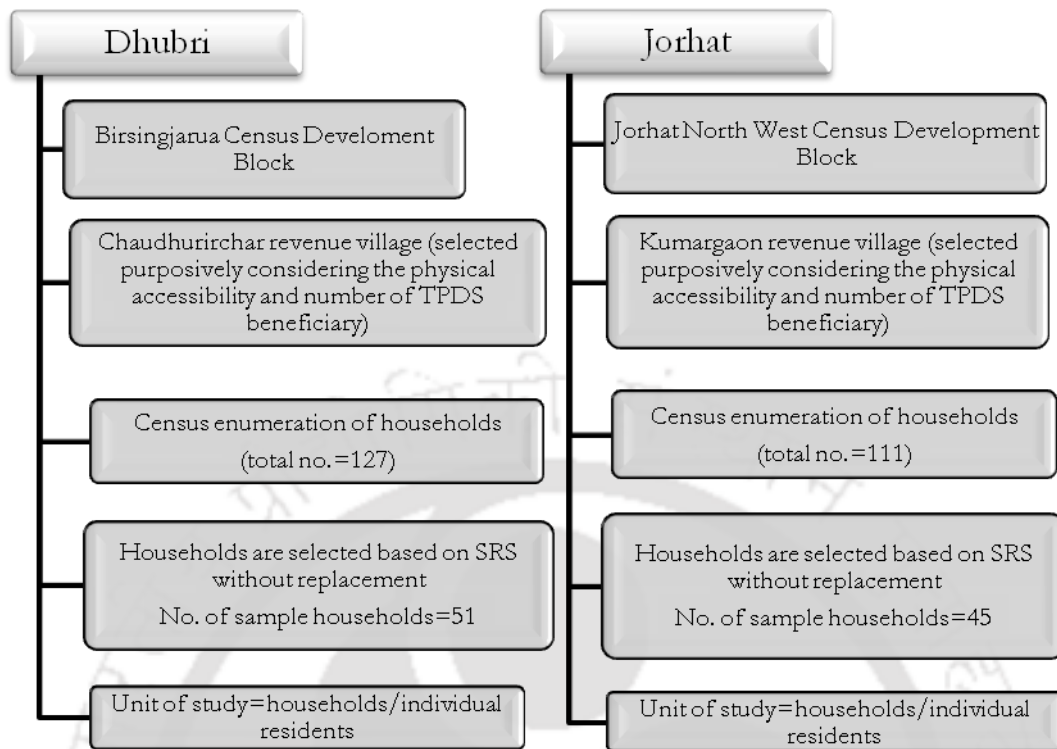
The official records of the Joint Directorate of Health in Dhubri showed that the problem of hunger is acute in char areas affected by floods. Therefore I decided to select a char village which was flood affected and yet was most easily accessible from the main town of Dhubri. Based on Census 2011, the total number of CD blocks in Dhubri was 15 in number. I purposively chose to study Birsingjarua CD block as it was closely located to the Dhubri town and facilitated my travel and stay during the period of study. From this block revenue village Chaudhurirchar was selected in consultation with the Directorate of Health officials as according to them the dependence on PDS in this particular village was high. Since the overall characteristic of Dhubri district pointed to a very high incidence of floods and soil erosion, studying a char village became significant as I assumed that people's

dependence on food based welfare programmes will be relatively higher. In the village listing of Census 2011, Chaudhurirchar Part -1 and Part -2 appear as two separate revenue villages. From my field survey, the total number of households in Chaudhurirchar Part-1 was 11, whereas Census 2011 recorded 30. In Chaudhurirchar Part 2 the total number of households during my field survey was 116, and the Census 2011 recorded 113. I studied both revenue villages and for data analysis combined them for presentation as only Chaudhurirchar Revenue village. Combining both revenue villages for data analysis did not pose any problems as there were no significant socio-economic differences among both villages. From the consultations that I had with people in the village, I was informed that large numbers of households had been displaced from these villages due to regular floods and soil erosion.

Similarly, in Jorhat, hunger and malnourishment was identified as being high in the char areas; these were also the areas that were predominantly tribal and had high incidence of tea garden labourers. A similar consultation with Directorate of Health officials were carried out in Jorhat and the revenue village Kumargaon from CD block Jorhat North West was selected as my study area. The total number of CD blocks in Jorhat according to Census 2011 was eight. Kumargaon was also severely flood and soil erosion affected. While the Registrar General of Census of India and other official records refer to this village as Kumargaon, residents mention the name as Vitorkokilakumargaon. After validation with data emerging from the Census and discussions with the village Headman I have stuck to the Census name of Kumargaon.

The selection of study villages and sample households is shown in figure 3.1. The district map and location of village is shown by figure 3.3 at the chapter end.

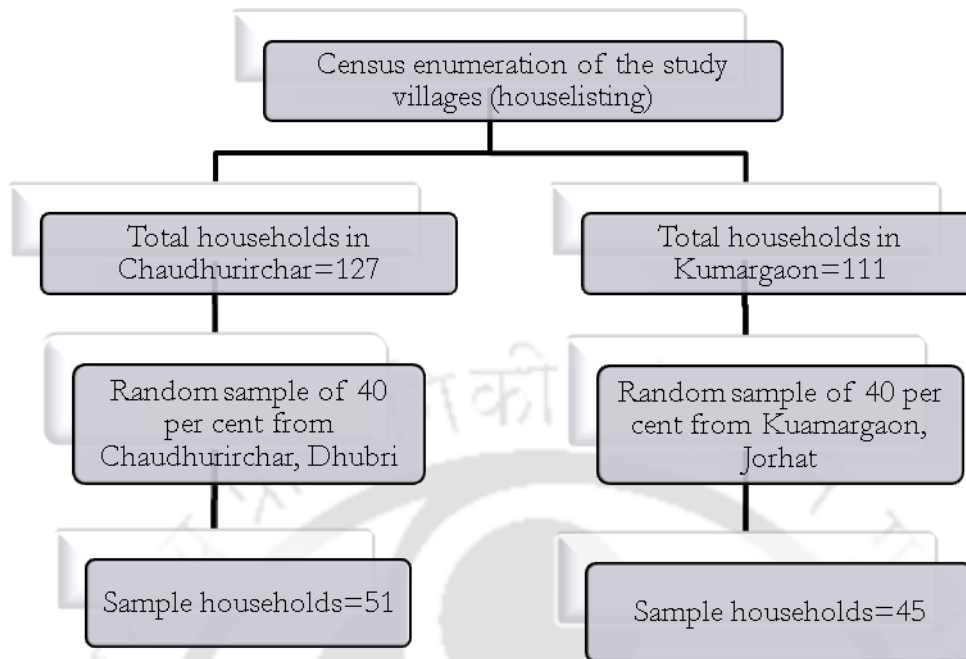
Figure 3.1 A flowchart showing selection of revenue villages



### 3.1.1 Sample design

The survey was carried out in two phases. In the first phase, a complete enumeration of all households in both revenue villages was done with the help of a structured questionnaire, where information on household size, education, marital status, occupational status of the household members, status of ration cards, status of having access to various food based welfare programmes, land holding position of the households and households having access to two square meals a day was collected. From the house listing it was found that total number of households in Chaudhurirchar was 127 and in Kumargaon 111. Based on the houselisting data, 40 per cent of households were selected through simple random sampling in each revenue village. Thus in Chaudhurirchar village 51 households were sampled and in Kumargaon village 45 households were sampled.

Figure 3.2 A flowchart on selection of sample households



### 3.2 DESCRIPTION OF STUDY AREA - DISTRICTS

Dhubri is the westernmost district of Assam and shares State boundaries with West Bengal, Meghalaya and international boundary with Bangladesh. It is located between 89.42 to 90.12 degrees east longitude and 26.22 to 25.28 degrees north latitude. It is located 30 meters above the sea level on average. The total area of the district is 2176 sq. km. Total population of the district is 1,949,258 as per 2011 census and decadal increase in population from 2001 to 2011 is 24.4 per cent, the density of population being 896 per square kilometer. Sex ratio is 953. The overall literacy rate is 58 per cent, with male literacy 63.1 per cent and female literacy 53 percent.

The river Brahmaputra and its eight tributaries (Champavati, Gaurang, Gadadhar, Gangadhar, Tipkai, Sonkosh, Silai and Tinjram) flow through Dhubri. Dhubri is primarily an agricultural economy. The major crops cultivated are Paddy, Jute and Pulses. It is known as an industrially backward district of Assam. Dhubri is considered as 'permanently flood

affected' (Jain et al, 2006). More than 50 per cent area of the district remains entirely flood affected in a year (*ibid*). Based on the records of the revenue department of state government of Assam, Dhubri is one of the worst affected districts due to flood related soil erosion (Goyari, 2005).

Jorhat is located at the eastern part of Assam. Total area of Jorhat district is 2851 sq. km. and density of population is 383 per sq. km. Total population of Jorhat is 1,092,256 and decadal growth of population is 9.31 from 2001 to 2010. Sex ratio of the district is 962 and literacy rate is 82 per cent with male literacy of 87.63 per cent and female literacy of 76.45 per cent. Brahmaputra River spreads through the northern part of Jorhat. It was the capital of Ahom Kingdom and later emerged as a hub of tea industry during British rule. Jorhat is also acclaimed for various educational institutions since the British rule. It is also mainly agriculture based economy and paddy is widely cultivated crop but the district gets large share of revenue from its tea-industry.

Dhubri was ranked the lowest in human development index (HDI) in 2003 and third lowest in 2014. On the other hand Jorhat had the highest HDI rank in 2003 and second highest in 2014 (Human Development Reports, Government of Assam, 2003 and 2014). However, the 2014 human development report of the state has outlined various interesting socio-economic facts about both these districts. Dhubri (20.1 per cent) has very high multi-dimensional poverty as compared to Jorhat (4.7 per cent). Another important economic indicator is possession of cultivable land. Dhubri has 66 per cent landless households whereas Jorhat has 29 per cent landless households. Indicators related to the basic household infrastructure shows that 74 and 72 per cent of households in Dhubri and Jorhat districts do not have toilet facility respectively. About 2 per cent households of Dhubri do not have proper drinking water facility and 9 per cent households of Jorhat district do not have proper drinking water facility. 57 per cent households of Dhubri do not have access to

electricity and 21 per cent households of Jorhat do not have access to electricity. So far as household dwelling is concerned Jorhat has nearly 46 per cent kutchha houses and Dhubri has 40 per cent kutchha houses. Both the districts have large proportion of flood and erosion affected households. Above 31 per cent households of Jorhat and 23 per cent in Dhubri are affected by floods and 12 per cent in both the districts are affected by erosion. In Dhubri district, an average 24 days is spent to reconstruct and clean the house in a year, average number of workdays lost is 90 which is the highest among the flood affected districts of Assam, average number of school days missed was 57 which was second highest among the flood affected districts of Assam (Human Development Report, Government of Assam, 2014).

### 3.3 PROFILE OF CHAUDHURICHAH REVENUE VILLAGE

#### *Socio economic profile*

As the name itself indicates *Chaudhurichar* is a Char village. *Char* (Geographical name is- mid channel bar of the river) areas of Assam has some special characteristics. It is an integral part of the fluvial process of Brahmaputra and its tributaries. As Chakraborty(2014) mentions, “it is extremely braided channel of the river combined with its suspended particles and bed load during flood and gives rise to some almond shaped alluvial which is commonly known as *chars* (Bhagabati, 2001 cited in Chakraborty, 2014). Because of its typical geographic features, the existence of *char* is very unstable and can be wiped out at erosion during recurrent flood. Apart from this, the *char* areas are subject to erosion on their upstream and deposition on the downstream due to which they shift towards downstream. This results in change in the geometry and location of the chars in every flood and in every year.” Though the char areas of Assam have over 100 years old history, but information relating to the char dwellers is minimal. The Directorate of Char Area Development of

Assam carried out two socio-economic surveys on *char* areas of Assam, which is the only source of information on char dwellers of Assam. The first socio economic survey of *char* areas were carried out in 1992-93 and then it was repeated in 2003-04 by the government of Assam. The result of the first survey report (1992-93) shows that, Barpeta district has highest number of char villages and population followed by Dhubri and Jorhat districts. The second survey report (2003-04) shows that Dhubri district has the highest number of Char villages followed by Jorhat and Barpeta. .

Chaudhurirchar meets the Gauranga tributary of Brahmaputra River. It is located at a distance of 35km from Dhubri town and is within the Fulkatri Gram Panchayat. Religion wise there is a mix of both Hindu and Muslim households in the village. All Hindu households are categorized under the Other Backward Castes (OBC) social group and all Muslim households are classified under the general social group. Muslim households constitute 80 per cent whereas Hindu household constituted 20 per cent of the total households in Chaudhurirchar. Language spoken by the villagers is known as *bhatia*, a dialect of Bengali language.

Table 3.1 shows the village profile of Chaudhurirchar village both as per census data of 2011 and 2015 village survey data. Total number of households in 2011 was 143 and in 2015 it was 127. The Census data for 2011 shown here are combined for Chaudhurirchar Part 1 and 2. The decline in the number of rural households can be attributed to the displacements due to floods and flood related erosions. Total population was 743 in 2011 and 713 in 2015. Total male population was 52 per cent and total female population was 42 per cent in 2011 and it also remained the same in 2015. Sex ratio was 920 in 2011 and 938 as per village survey 2015. However, there is a sizeable difference in child sex ratio which was 938 in 2011 and it was 1254 as per 2015 village survey. Due to a sizeable difference in child sex ratio, I cross checked my estimate with the record of the ASHA worker in the village and it matched.

Therefore the difference with Census data is unexplained. Total literacy rate remained the same as 45 per cent both in 2011 and in 2015. Similarly total male literacy rate was 49 per cent and total female literacy rate was 40 per cent in 2011. This was 48 per cent and 45 per cent respectively in 2015.

Table 3.1 *Village profile of Chaudhurirchar revenue village, 2011 and 2015*

<i>Indicators</i>	<i>2011</i>		<i>2015</i>	
	<i>Number</i>	<i>Per cent</i>	<i>Number</i>	<i>Per cent</i>
Number of households	143	-	127	-
Hindu households	-	-	26	20
Muslim households	-	-	107	80
OBC households	-	-	26	20
General households	-	-	107	80
Population	743	-	713	-
Male population	387	52	368	52
Female population	356	48	345	48
Sex ratio	920	-	938	-
Child sex ratio*	938	-	1254	-
Male literacy rate	159	49	144	48
Female literacy rate	119	40	109	45
Total literacy rate	278	45	253	45

*Source:* Survey data, 2015

\*The data was verified with the population register of the ASHA worker although the AWW could not provide the exact figure.

*Note:* 1. The Socio-economic Caste census website (<http://secc.gov.in/statewiseTehsilCasteProfileReport>) accessed on 6<sup>th</sup> November 2017 did not provide village level data on caste. However the district level information for Dhubri showed 2.6 percent SC households, 0.09 percent ST households, 7.2 percent other households and 90.07 percent no caste and tribe households. 2. – means not applicable.

Table 3.2 shows the distribution of population of Chaudhurirchar village by the different types of occupation. Share of population employed in agriculture either as cultivators (6 percent) or as hired workers (3 percent) is very low. The overall dependence on agriculture in Chaudhurirchar village was very low, largely due to reasons of low operational holdings of land and loss of agricultural land to floods and soil erosion. Further while agriculture does not provide significant income, opportunities of non-agricultural income sources are also limited. Therefore people in the economically active age group are generally actively seeking work in any kind of an engagement that they can have recourse to.

Of the total population, 22 per cent are engaged in household works and all of such workers are women. 29 per cent of population is currently enrolled in school who are mostly children and adolescents. 15 per cent of population is out of labour force and are dependent on family. Only 3 per cent population is regular salaried and 9 per cent population is engaged in laboring out in non-agricultural activities. Such workers reported working mostly as helpers in construction works in Kokrajhar and Bongaigaon districts. Some travelled to Meghalaya and Guwahati on weekly, fortnightly or monthly basis. About 8 per cent of population engaged in petty trade as puffed rice sellers and wood collectors.

Table 3.2 Distribution of population by primary occupation in Chaudhurirchar village, 2015

Type of occupation	Number			Per cent		
	Male	Female	Total	Male	Female	Total
Cultivator	44	0	44	11.9	0	6.1
Labouring out in agriculture	17	3	20	4.6	0.9	2.8
Labouring out in non-agriculture	60	5	65	16.3	1.4	9.1
Self employed in non agriculture	34	1	35	9.2	0	4.9
Petty traders	37	18	55	10.1	5.2	7.7
Salaried	15	8	23	4.07	2.3	3.2
Currently enrolled in school	113	96	209	30.7	27.8	29.3
Household work <sup>1</sup>	0	154	154	0	44.6	21.5
Reported out of labour force <sup>2</sup>	48	60	108	13.04	17.4	15.1
<b>Total</b>	<b>368</b>	<b>345</b>	<b>713</b>	<b>100</b>	<b>100</b>	<b>100</b>

Source: Survey data, 2015

Note: 1. Primary occupation was reported as household work only by the females.

2. Includes children not going to school, economically productive age group people reporting no work, elderly people and few physically handicapped. In Census 2011 the percentage share of non-workers to total population was around 68 percent in Chaudhurirchar Part 1 and 72 percent in Part 2. This shows that the total number of dependent population in Chaudhurirchar is relatively very high. Some of the reasons cited by people in the economically productive age group regarding not participation in income generating activities were non-availability of opportunities of work within the village. Some of them reported that they were actively seeking work within the village but were unable to find opportunities of work. For e.g. work under MGNREGA had stopped coming for the last one year according to my respondents for the reference period being studied.

Table 3.3 shows the classification of working age population of Chaudhurirchar village by their levels of education. The table shows population who have attended and never attended schools. 57 per cent of working population never attended schools. 17 per cent of the population completed high school level of education, and it shows that maximum level of

education attained by most of the population are of high school level. Even among literate population, it was seen that they discontinue education after high school level for various reasons.

Table 3.3 *Level of education among working age population (> 15 years age group) in Chaudhurirchar village, 2015*

<i>Educational level</i>	<i>Number</i>	<i>Per cent</i>
Never attended*	259	57
Primary	28	6
Middle	43	9
High school	76	17
Higher secondary	45	11
Graduate	Nil	Nil

*Source:* Survey data, 2015

\*Never attended includes adult illiterate population

Table 3.4 shows the position of operational land holdings of the households in Chaudhurirchar village.<sup>15</sup> Almost half the village (49 per cent of households) of Chaudhurirchar are either landless or near landless. Among those possessing some operational land holdings, 43 per cent can be categorized as marginal households. The small land holding category constituted 4 per cent and semi medium 4 per cent. None of the households fell in the medium and large farm categories.

Table 3.4 *Distribution of households by size of operational holding in Chaudhurirchar village, 2015*

<i>Size of operational holding (in acres)</i>	<i>Number</i>	<i>Percent</i>
< 0.005	62	49
> 0.005 - < 2.47	55	43
> 2.47 - < 4.95	5	4
> 4.94 - < 9.88	5	4

*Source:* Survey data, 2015

<sup>15</sup>The unit of measurement for size class of operational holding (in acres) was adapted from NSSO classification of size of operational holding. The NSSO classifies households into five types based on the size of operational holding. They are landless or near landless (< 0.005acres), marginal (> 0.005 - < 2.47acres), small (> 2.47 - < 4.95acres), semi medium (> 4.94 - < 9.88acres), medium (> 9.88 - < 24.71acres) and large (above 24.71 acres) size of landholding households (NSSO 55<sup>th</sup> round, 2001).

### 3.4 PROFILE OF KUMARGAON REVENUE VILLAGE

#### *Socio economic profile*

Kumargaon village is located about 15km away from the Jorhat town. The inhabitants of the village belong to 'potter' (in native language Kumar) community and the village is named after them. Religion of all the population of the village is Hindu and all population belongs to OBC social category. Language spoken by the villagers is Assamese. The embankment of the river Brahmaputra runs through the village dissecting the village into two- one part protected by the bankment while the other left to the mercy of the floods. The embankment also serves as a main road of the village.

Table 3.5 *Village profile of Kumargaon revenue village, 2011 and 2015*

	2011		2015	
	Number	Per cent	Number	Per cent
Number of households	163	-	111	-
Hindu households	-	-	111	-
Households of other religious group	-	-	NA	-
Social group	-	-	OBC	100
Male population	397	53	242	51
Female population	359	47	235	49
Population	756	-	477	-
Sex ratio	904	-	971	-
Child sex ratio	942	-	615*	-
Male literacy rate	351	88	189	88
Female literacy rate	299	83	174	79
Total literacy rate	650	86	363	83

*Source:* Survey data, 2015

*Note:* \*The data has been confirmed and cross checked with the delivery register of the Anganwadi worker of the village.

Table 3.5 shows the demographic profile of Kumargaon village<sup>16</sup>. Total number of households was 163 in 2011 which declined to 111 in 2015. The village headman informed

<sup>16</sup>As per the village headman of Kumargaon village, there is every possibility of data mismatch with Census 2011 data. There are four parts of the village and all the households are thickly and densely situated, as there is no particular boundary between the households in all four parts. Therefore, there is every possibility of mixing up of household level information, among these four parts. Out of the four parts, one part does not have ST and SC population. As the study village also does not have ST and SC population as per respondents, therefore

that the reason behind this decline in total number of households was largely displacement due to erosion and no opportunities of agriculture. Total population was 756 in 2011 which was 477 in 2015. Total male population was 397 in 2011 and 242 in 2015. Similarly, total female population was 359 in 2011 and 235 in 2015. Sex ratio was 904 in 2011 and 971 in 2015.

However, there is alarming decrease in the child sex ratio which was 942 in 2011 and reached 615 in 2015 based on my survey data. I cross-checked the child sex ratio data with Anganwadi worker of the village by doing a random check of the 2012-13 record. In that year, of the 26 pregnant women, 23 gave birth to male children. During the period of my survey, I got a sense of sex-selective abortions carried out in the village however this could not be validated as my questionnaire did not contain questions on fertility and neo-natal births.

Total literacy rate was 86 per cent in 2011 and it was 83 per cent in 2015. Male literacy rate was 88 per cent and female literacy rate was 83 per cent in 2011 and it is found to be 88 per cent and 79 per cent respectively in 2015.

Table 3.6 shows the classification of working age population of Kumargaon village by their level of education. It was seen that above 41 per cent of the population have reached the level of secondary education, 21 per cent reached higher secondary level, 8 per cent had primary level of education and above 10 per cent middle level of education. Slightly above 2 per cent of population reached graduation and post-graduation level.

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that village is considered for comparison. Further, information derived from GoP's PDS portal and GoP's ICDS portal matches up with the survey data.

Table 3.6 *Level of education among working age population(> 15 years age group) in Kumargaon village, 2015*

<i>Educational level</i>	<i>Number</i>	<i>Per cent</i>
Never attended	63	17
Primary	31	8
Middle	38	10
High school	153	41
Higher secondary	79	21
Graduate and above	9	2

*Source:* Survey data, 2015

Never attended includes adult illiterate population

Table 3.7 shows the distribution of households in Kumargaon village by size of operational holding. About 23 per cent households belong to landless or near landless, 63 per cent are marginal landholding households, 7 per cent possess small operational size of holding and remaining 7 per cent possesses semi medium size of operational holding. There were no medium and large operational landholding households in this village. Thus large number of landless households in the village shows the depth of vulnerability of the households because land is the main asset for any particular rural set up. Household falls in the trap of poverty when they are landless along with an extra burden of no other income generating avenues.

Table 3.7 *Distribution of households by size of operational holding in Kumargaon village, 2015*

<i>Size of operational holding(in acres)</i>	<i>Number</i>	<i>Percent</i>
< 0.005	25	23
> 0.005 - < 2.47	70	63
> 2.47 - < 4.95	8	7
> 4.95 - < 9.88	8	7

*Source:* Survey data, 2015

Table 3.8 shows the distribution of population of Kumargaon village by the different types of occupation. 25 per cent of the population is engaged in household works and all of such workers are women. 21 per cent of population is currently enrolled in school who are mostly children and adolescents. 11 per cent of population is out of labour force and they are mostly dependent on others. Among economically active group, only 6 per cent

population is regular salaried person. 16 per cent of population is engaged in laboring out in non-agricultural activities. 14 per cent of population is engaged in petty trade, 4 per cent of population is cultivators, 3 per cent of population is engaged in self-employed in non-agricultural activities and no one has reported their primary occupation as agricultural labourer<sup>17</sup>.

Table 3.8 *Distribution of population by primary occupation in Kumargaon village, 2015*

<i>Occupation</i>	<i>Number</i>			<i>Per cent</i>		
	<i>Male</i>	<i>Female</i>	<i>Total</i>	<i>Male</i>	<i>Female</i>	<i>Total</i>
Cultivator <sup>18</sup>	20	1	21	8.3	0	4
Labouring out in non-	76	0	76	31.4	0	16
Self-employed in non-agriculture	11	1	12	4.5	0	3
Petty trader	25	40	65	10.3	17	14
Government salaried	24	4	28	9.9	2	6
Household work	7	114	121	2.9	49	25
Currently enrolled in	48	54	102	19.8	23	21
Reported out of labour	31	21	52	12.8	9	11
Total	242	235	477	100	100	100

*Source:* Survey data, 2015

It is important to note that in both the villages work related to agriculture is very less such as cultivation and agricultural laboring out. Cultivation is less because of various factors mainly uncertainty of crop production and lack of entitlement of land. Similarly, as per the respondents, they prefer less agricultural laboring out because it is seasonal and uncertain as compared to other non-agricultural work, preference family labour. Further wage rate in agriculture is much lower than non-agricultural sector, and lack of employment security throughout the year.

<sup>17</sup>As per 2011 Census, total number of agricultural labour was only 1 in Kumargaon village.

<sup>18</sup>Cultivators are small in number because size of operational holding is small, and income from the cultivation cannot support the household for the whole year and also high input cost and low output.

### 3.5 MAJOR CROPS CULTIVATED IN BOTH VILLAGES

Main food crop cultivated in *Chaudburirchar* is summer paddy (most cultivated are IRRI and its different variety) and black gram (*matikalai*). Among non-food, Jute (*pata*) and Mustard seeds are widely cultivated. Paddy is mostly cultivated only for household consumption though costs of cultivation reported by the households were very high. Majority of the households cultivate IRRI paddy crops because cultivation of IRRI crop not only gives them more yield per *bigha* (equivalent of 0.33 acres) of land but is also more suitable for flood affected areas. Cultivation begins in the month of November-December and crops can be harvested at the end of May which is just before the starting of monsoon. Therefore IRRI crop has proved to be more suitable for flood affected areas. On the other hand, in *Kumargaon* village, winter paddy or *Sali* is the main crop cultivated across the village and a few households cultivate mustard seeds. Table 3.9 shows the pattern of cultivation in both the villages.

Thus majority of the household in both the villages does farming at a subsistence level and they cultivate paddy for self-consumption. This gives them food support for some months or for whole year depending upon their land holding capacity. Other three crops- jute, black gram and mustard seeds are done for commercial sale in the market, because the cultivation of these three crops involves less amount of cost and it gives a higher amount of return compared to paddy. Summer paddy (IRRI) cultivation requires more amount of water as well as other input costs of chemical fertilizer and purchase of HYV seeds. Source of irrigation is shallow tube wells (used to lift groundwater) and therefore it needs higher amount of irrigation cost because of higher fuel price to run shallow tube wells. However winter paddy does not require large amount of investment, but the yield rate is also low as compared to the other variety.

Table 3.9 Major crops cultivated in Chaudhurirchar and Kumargaon village

<i>Crops cultivated</i>	<i>Month of Sowing</i>	<i>Month of Harvesting</i>	<i>Source of Irrigation</i>
<i>Chaudhurirchar</i>			
Summer paddy (IRRI)	November-December	May-June	shallow tube wells
Winter paddy ( <i>Sali</i> )	April-May	October-November	Rainwater
Jute	March	September	Rainwater
Urad dal	October	January	Rainwater
Mustard	October-November	January	Rainwater
<i>Kumargaon</i>			
<i>Crops cultivated</i>	<i>Month of Sowing</i>	<i>Month of Harvesting</i>	<i>Source of Irrigation</i>
Winter paddy ( <i>Sali</i> )	- do -	- do -	- do -
Mustard	- do -	- do -	- do -

Source: Survey data, 2015

### 3.6 BASIC INFRASTRUCTURE IN THE STUDY VILLAGES

Table 3.10 shows the basic infrastructure available in both Chaudhurirchar and Kumargaon revenue village.

#### *Village road*

The eastern and southern parts of *Chaudhurirchar* village remains submerged during the monsoons. The villagers have to struggle with clayed roads during the entire monsoon. The villagers use wooden boat and boat made out of banana tree to move around the village. Nearest market is Fulkatri, which is located about 3km from the village. Fulkatri market has been the worst affected by flood and erosion. Main road of the village is also damaged by flood and the communication becomes more pathetic during monsoon.

In Kumargaon village too, roads remain in a bad condition. Nearest market is Jorhat which is 15km away from the village. Kumargaon village has slightly better infrastructure than that of Chaudhurirchar village.

Table 3.10 Availability of basic infrastructure in Chaudburirchar and Kumargaon revenue villages

Availability of infrastructure	Chaudburirchar	Kumargaon
Electricity	123	107
Safe drinking water	120	83
Sanitation	47	52
School/College	One primary school/ One middle school in the village	One primary school in the village
Distance from nearest town	35km (approx)	15km (approx)
Distance from primary health centre	70km	2km
Name/distance of nearest market	Fulkatri/6km	Jorhat/15km

Source: Survey data, 2015

#### Housing condition

The housing condition is very poor. There is no pucca<sup>19</sup> house in Chaudburirchar village. The houses of the villages are mainly semi-pucca and kutchha houses. People make houses out of roof tin to cope with flood, but it exerts extra heat making the condition harsher, with minimal amount of power supply. Therefore, throughout long months of the year, the people of the village have to live in an unhealthy living condition. Moreover, the households who cannot afford to purchase roof tin build kutchha houses.

In Kumargaon village, the three types of houses found are: pucca, semi pucca and kutchha. Number of semi pucca and kutchha houses is more than the number of pucca houses. The living condition is unhealthy because of the fragmentation of landholding. The houses are therefore densely located. Also those houses which are more exposed to water and flood has to bear repair cost every year during monsoon.

<sup>19</sup>Definition of Pucca, semi pucca and kutchha houses are as follows: Pucca (walls of the house is made of materials like burnt bricks, stones- packed with lime or cement, timber, ekraetc and roof materials are tiles, GCI (Galvanised Corrugated Iron) sheets, asbestos cement sheet, RBC (Reinforced Brick Concrete), RCC (Reinforced Cement Concrete) and timber etc.), semi pucca (a house that has fixed walls made up of pucca material but roof is made up of the material other than those used for pucca house) and Kutchha houses (the walls and roof of which are made up of such as unburnt bricks, bamboos, mud, grass, reeds, thatch, loosely packed stones, etc).

### *Access to safe drinking water*

Main source of drinking water is hand pump in both the villages. In *Chaudburirchar* village, 120 households have their own hand pump. During monsoon when there is flood, households cannot have safe drinking water as hand pump water gets contaminated due to flood. These households arrange drinking water from the other households who are not affected by the floodwater. In *Kumargaon* village, 83 households have their own hand pump; remaining households does not have their own hand pump but arrange their drinking water from their nearby neighbouring households.

### *Sanitation*

The process of identification of beneficiary households and building of subsidized toilet under Rural Sanitation Programme were in progress during the time of survey. As the programme is implemented in different phases in *Chaudburirchar* village, first phase was completed and till the time of survey 40 households are benefitted from this scheme. In *Kumargaon* village too, the first phase was completed and at the end of first phase total number of 44 households got proper toilet facility.

### *Electricity*

In *Chaudburirchar* village 123 households and in *Kumargaon* village 107 households has electricity facility. But the households' complained about frequent power cut during summer.

### *Primary Health Centre*

Primary Health Centre, which is supposed to provide basic healthcare facilities at government subsidized rates to the villagers, is located in about 70km away from the *Chaudburirchar* village. It takes about three hours from the village to reach the health centre. After crossing the river by boat one has to take bus to reach the PHC. So the better option

in the hands of the villagers is to go to the Dhubri Civil Hospital which is 35km by road. In case of Kumargaon village, Primary Health Centre is located just 2km away from the village.

#### *Schools and Anganwadi Centres*

There is one lower primary school and one middle school in *Chaudburirchar* village. There is no high school in the village, nearest high school is located about 10 km away from the village. On the other hand, there is one Primary School in *Kumargaon* village. Middle School and High School is about 5km away from the village. Anganwadi Centre (AWC) is constructed adjacent to the primary school in both the villages. There is one AWC in each village. The details of operation of AWC are discussed in chapter 6.

#### *Access to PDS and other food based welfare programmes*

Table 3.11 shows the list of beneficiary households covered under different food based welfare programmes derived from houselisting schedule. The major food based welfare programmes operating in the studied villages are the targeted public distribution system (TPDS), Integrated Child Development Services-Scheme (ICDS) and cooked mid-day meal programme (CMDM). Functioning of these programmes in both the villages is discussed in chapters 5 and chapter 6.

Table 3.11 *Access to food based welfare programmes in the study villages, 2015*

<i>Ration cards/programmes</i>	<i>Chaudburirchar</i>		<i>Kumargaon</i>	
	<i>Number</i>	<i>Per cent</i>	<i>Number</i>	<i>Per cent</i>
AAY	20	16	37	33
BPL	44	35	22	20
APL	25	20	17	15
MMASY	20	16	19	17
Multiple cards	nil		3	3
No ration cards	18	14	13	12
ICDS*	134	100	42	100
MDM*	74	100	65	100

*Source:* Survey data, 2015,

\*ICDS and MDM coverage is 100 percent as all the eligible beneficiaries are covered under these two scheme

## Chapter 4

### Functioning of Targeted Public Distribution in Rural Assam: 1997 to 2013-14

This chapter discusses the functioning of the public distribution system (PDS) in Assam with particular focus on the period 1997 to 2013-2014. The PDS is by far, the largest demand side food distribution programme, where the burden of subsidy is borne by the Central government. While food in India is both a Union and State subject, PDS is largely centrally funded, with the burden of distribution on the states. The PDS in Assam is almost entirely centrally funded. The price of PDS foodgrains in Assam is decided by the State government and it varies with the geographical terrain. Therefore Assam follows some form of geographical targeting as well as narrow targeting based on above and below poverty line population. At present rice, kerosene and small amount of wheat is distributed to the beneficiary households. Distribution of levy sugar has stopped since 2013. This chapter discusses rice distribution, as currently rice is the main food item distributed through PDS in the state.

Section 4.1 depicts the organisational structure of PDS in Assam. Section 4.2 discusses the extent and spread of fair price shops. Section 4.3 throws light on identification of PDS beneficiaries and Section 4.4 elaborates on the current state issue price of rice in different regions of Assam. I conclude this chapter with a summary on the characteristic features of targeted public distribution system of Assam.

#### *4.1 ORGANISATIONAL STRUCTURE OF PDS IN ASSAM*

The Department of Food, Civil Supplies and Consumer Affairs (FCS & CA) is at the helm of affairs in the State in respect to public distribution of food. Broadly the organizational structure of PDS in Assam caters through different sets of officials in the plain areas and the autonomous council districts. At the State level the Directorate of

FCS & CA is the nodal agency. In the plains districts PDS functions under the direct orders of the District Commissioners through the offices of Deputy Director or Assistant Director. In the autonomous council districts PDS functions under the direct control of Council Head of Department through the offices of Deputy Director or Assistant Director as the case may be. The directorate of FCS & CA is directly responsible for implementation of all Acts/Rules and orders of Central and State governments in all districts of the State through the above mentioned functionaries. Figure 4.1 provides a flow chart of organizational structure in Assam.

At the district level the official in charge of PDS is known as the District Civil Supplies officer, block level functionary is known as Sub-divisional food and supply officer, at the gram panchayat level the secretary is responsible for distribution to the fair price shops. The fair price shops in Assam are mostly private dealers who are finally responsible for distribution of PDS commodities to the rural households.

The GoA has entrusted the responsibility of distribution of PDS items to co-operative societies after late 1970's. Since then, the co-operative societies (or *Samabay Samities*) have been playing a major role. Among the various types of co-operative societies, Primary Agricultural Co-Operative Societies (which works at the Gram Panchayat level and also known as Gram-Panchayat Samabay Samities or GPSS) plays a major role. The other distributing agents are Whole Sale Co-operatives in the urban areas and Large Area Multi Purpose Societies in Hill areas. Among the multiple tasks that the GPSS performs, one of them is to provide credit support to the farmers. But over the years, these GPSS faced losses due to defaults, managerial inefficiency and contraction of the state government's budgetary support. Currently GPSS engage mostly in distribution of PDS commodities.

Official rate of transportation fee and profit margin to be charged by the GPSS from the consumer is fixed by the GoA. This profit margin for rice and wheat was fixed at 2.5per cent for the wholesale co-operative in the urban areas and 5 per cent for GPSS in rural areas for both APL and BPL households from June 1995 to till July 2001. The same charge was revised to 3.10per cent in urban areas and 6.29per cent in rural areas since July, 2001 and it remained so till 2015 (Departmental circulars, Government of Assam). Due to non-revision of margins for the GPSS's, they have had to depend on loans from banks and private traders. In the more recent times banks have refused to grant loans and therefore many GPSS take loan from private traders to purchase PDS rice from the Food Corporation of India (FCI). Many GPSS in the state have had to close down PDS shops due to heavy losses.

For storing of PDS commodities the Government of Assam (GoA) had constructed many go downs for the GPSS in 1974. Since then the GoA has from time to time granted funds for godown construction, purchase of vehicles and repayment of loan overdue amount to save many dormant GPSS which were unable to repay their bank loan. Apart from profit margin to the GPSS, at present, the GoA is also providing an amount of transportation fee of Rs30 per quintal of rice for carrying AAY rice and wheat by the GPSS. However the GoA is irregular in providing this amount and therefore the final consumers have had to bear the burden of increasing 'transport costs'.<sup>20</sup>

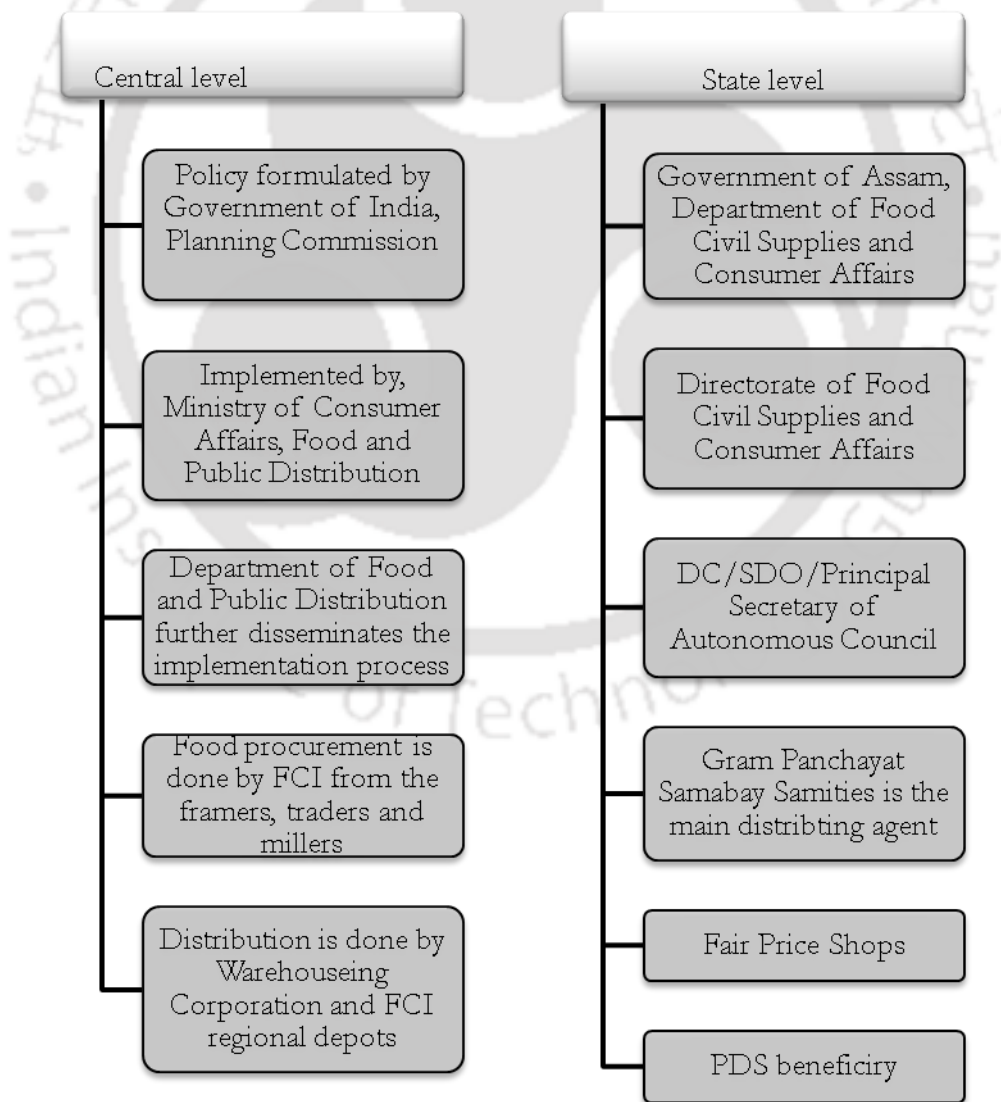
State level procurement of paddy for PDS took place in the state through Assam State Federation and Food Corporation of India in the 1970s. This system of procurement continued till the beginning of TPDS. With the new policy of targeting, GoI introduced

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<sup>20</sup>Issues regarding dormant GPSS's and increasing transportation costs hampering PDS functioning was discussed with various officials at the Department of Food and Civil Supplies in 2014, in Guwahati, on grounds of anonymity.

decentralised procurement system with the objective of enhancing efficiency in the PDS system. Since then 15 major states of India started following this system, however Assam withdrew from state level procurement processes. Therefore, Assam depends entirely upon the central pool for public distribution. Presently, FCI and Assam Food Civil Supply and Consumer Affairs (FCS & CA) department are the key agencies involved in distribution of PDS items in the state. The state government calculates the amount of allocation of foodgrain to the beneficiaries, fixation of end consumer price on the basis of transportation charge and commission of the GPSS and FPSs.

Figure 4.1 *Flow chart of organizational structure of PDS in rural Assam*



#### 4.2 IDENTIFICATION OF PDS BENEFICIARIES IN ASSAM

The targeted public distribution system was introduced in Assam in 1997 when households were divided into BPL and APL based on the poverty line criterion fixed by the Central government. The Expert Group of Planning Commission, GoI estimates poverty rates for India and its States by using the NSSO quinquennial data since the 1960's. The GoI issued notification to the department of FCS&CA, GoA to identify the BPL population as per the norms fixed by the GoI in 1995. In that year, the total number of families of the state was 4.6 million and 40.86 percent households were identified as BPL households. The upper limit of income for BPL beneficiary household was fixed at Rs 15000 per annum and total number of BPL households was calculated as 1.9 million in the state. The GoA identified those families with the help of department of Panchayat and Rural Development in the rural areas and Municipal Corporation and Town Committee in urban areas (GoA, 2010).

In November 2001, the Antyodaya Anna Yojana (AAY) scheme was introduced that identified poorer households from within the BPL categories to whom PDS rice was provided at a more subsidized rate. The GoA identified 704,000 households as AAY beneficiaries from the existing 1.9million BPL households, of which 4000 beneficiaries were tea-garden labourers. The upper limit of the income of the AAY household was Rs 6000 per annum at the 1993-94 prices. Those not identified as either BPL or AAY households were considered as APL. However no income criterion was fixed for the APL households. The BPL and AAY beneficiary households count that was arrived at during the introduction of targeting had remained the same in Assam till 2015 (GoA, 2014).

Along with the above categories of households, which were determined based on the Central government policy of targeting, Government of Assam also created a category of

poor households who would get BPL benefits. The programme under which they were categorized as such was known as the Mukhya Mantrir Anna Suraksha Yojana (MMASY) and was operationalized from October 2010. The GoA selected 15,000 families per Legislative Assembly Constituency Beneficiaries of this scheme were identified by Block level officers with the help of local Panchayat members. Rice distributed under this scheme is actually the *additional BPL rice* which has been released by the Central government to the State government on request from time to time. However the distribution of rice under this scheme has come down. It is evident that the identification of beneficiaries for this scheme was solely as per the wish of state government with the help of local panchayats.<sup>21</sup>

Table 4.1 Targeted *food distribution policies currently operating in Assam*

Programmes	Year	No of beneficiary households till 2011-2012 to 2015	Guidelines for beneficiary selection
Above Poverty Line(APL)	1997	38,28,290	Other than AAY and BPL
Below Poverty Line(BPL)	1997	12,02,000	Not more than Rs. 15,000 per annum
Antyodaya Anna Yojana(AAY)	November 2001	7,04,000	From the BPL, poorest of the poor,(Rs. 6000/-annum)
Mukhya Mantrir Anna Suraksha Yojana(MMASY)	October 2010	19,73,425	Additional BPL families who are not covered under any of the above mentioned scheme
Priority households	December 2015	50,45,566	Under the National Food Security Act 2013
Antyodaya Anna Yojana (AAY)	December 2015	6,90,071	Under the National Food Security Act 2013

*Source:* Assam State Food, Consumer and Civil Supplies, Government of Assam.

<sup>21</sup> A district wise distribution of AAY and MMASY beneficiary households is provided in Tables A4.1 and A4.2.

The National Food Security Act 2013 brings together several programmes, but mainly TPDS, nutrition component of ICDS and school feeding programmes through MDM. This Act was implemented in the state in 24th December 2015 and it is an extension of earlier TPDS policy. As per NFSA 2013, 84.17 per cent of rural population and 60.35 per cent of urban population of Assam will be covered to provide subsidised foodgrain. The information on beneficiary households under NFSA is derived from the PDS portal of Government of India.

Guidelines followed for the selection of beneficiaries under NFSA 2013: The beneficiaries under NFSA 2013 have been broadly classified into two categories; AAY households and the Priority Household (PH). The officials from the department of Panchayat and Rural Development and department of FCSCA are the main state agents involved in the beneficiary identification process.

The AAY beneficiaries are selected from the Government of India's AAY guideline of 2000, 2003-2004, 2005-06 and 2009 (GoI, 2013). In Assam, the AAY households are selected from already existing old database of AAY cardholder households. Thus total number of AAY beneficiary households were identified from existing 7, 04,000 beneficiary households. On the other hand the PHs are selected on the basis of income criteria of households, not exceeding annual income of Rs 1 lakh, with the help of Panchayats in rural areas and Municipal boards in urban areas. Selection of PHs was freshly based on the prescribed income criteria. The children below age group of 10 as per 2011 Census were excluded from the list of beneficiaries (Table A4.3 shows the district wise distribution of Priority and AAY households under NFSA.).

#### 4.3 QUANTITY OF RICE ALLOTTED TO BENEFICIARY HOUSEHOLDS, 1997-2014

Quantity allotment of rice per beneficiary households is shown in table 4.2. The quantity allocation of BPL rice was fixed at 10kg per beneficiary household in 1997. It was increased to 20kg per households in 2000. In 2001, BPL allocation was further increased up to 25kg per households and AAY beneficiaries were allotted 25kg per households. From April 2002 onward, the allocation of rice has been 35kg per households. However the central government has not provided any specific norm of quantity allocation to the APL households.

The MMASY households that used to get an entitlement of 20 kg per household per month saw a decline in entitlement to 6 kg per household by 2014. The quantity of rice provided to the AAY households under NFSA 2013 remained fixed at 35 kg per household at the rate of Rs 3 per kg, whereas the PHs were provided 5 kg of rice per person at Rs 3 per kg.

Table 4.2 *Quantity allotment (kg per households) of rice for BPL and AAY beneficiaries*

Year	BPL	AAY
1997	10	
2000	20	
Jul-2001	25	25
April 2002 to 2015	35	35

*Source:* Government of India, 2014

#### 4.4 SPREAD OF FAIR PRICE SHOPS IN ASSAM

The fair price shops in Assam are largely owned or operated by the Gram Panchayat Samabaya Samitis, Wholesale Cooperatives, LAMPS or private individuals. Data on FPS in Assam has been collected from the various issues of Economic Survey of Assam and number of FPS in Assam has been compiled from the period of 1994-95 to 2013-14. Fair Price Shops operates in both rural and urban areas, but their spread is more in-depth in rural areas.

As per records of GoA, in 1981-82, the total numbers of GPSS were 665 and number of WCOS was 17. The GPSS owned 15,821 numbers of Fair Price Shops which were functioning at the village level. In Urban Assam, 130 Consumer Co-operative Stores which were owned by WCOS and 2196 private individual shops were functioning at the plain districts of Assam. In hill areas these co-operative societies are named as Large Area Multi Purpose Societies (LAMPS) and 21 LAMPS were functioning with their 349 retail outlets in hill areas of the state. Besides these, STATEFED also had 164 retail outlets in different parts of the state which were engaged in distribution of essential commodities in the state.

The fair price shops are government license holder who purchase the commodities from their respective GPSS/WPCS/LAMPS and finally distribute it to the consumers. Till January 2013, the total number of FPS in the state are 32,124, whereas the total numbers of GPSS is are 708, the total number of WSCCS are 34 and total number of LAMPS are 53.

Table 4.3 shows the number of fair price shops in Assam from 1994-95 to 2013-14. It is seen that immediately after the introduction of TPDS in 1996-97, the number of FPS has decreased in the state. The total number of FPS in rural areas in 1996-97 was 29,579 which declined to 28,687 after introduction of TPDS in 1997-98.

Though this has increased in 1999-2000 up to 29,496 numbers, but started decreasing to 29,514 in 2000-01 when second phase of TPDS was introduced in 2001. This has increased in 2001-02 but decreased in 2002-03. For four years the number of FPS remained the same. Average number of population per FPS was also declined to 750 in 1996-97 which was 822 in the previous year 1995-96 which means that average number of population per FPS also started declining after the introduction of TPDS in the state. The Government of India has also set up a norm that the total number of families to be covered by one FPS in rural areas is 1000 and number of families needed to be covered by one FPS in urban areas is 2000.

Table 4.3 *Number of Fair Price Shops in Assam, 1993 to 2014-2015*

<i>Year</i>	<i>Rural</i>	<i>Urban</i>	<i>Total</i>	<i>Number of population per Fair Price Shop(average)</i>
1993	3238	24197	27435	–
1994	3,408	26313	29,721	812
1995	26,620	3478	30106	822
1996-97	29,579	3701	33,280	750
1997-98	28,687	3660	32,347	784
1998-99	28,687	3660	32,347	795
1999-2000	29,496	3742	33,238	801
2000-01	29,514	3751	33,265	801
2001-02	29,569	3660	33,229	802
2002-03	29,322	3907	33,229	802
2003-04	29,322	3907	33,229	870
2004-05	29,322	3908	33,230	883
2005-06	29,322	3980	33302	904
2006-07	29,392	3907	33299	904
2007-08	29,395	3937	33332	903
2008-09	29,381	3922	33303	945
2009-2010	30,506	4030	34,536	898
2010-11	-	-	34,536	-
2011-12	-	-	37,126	-
2012-13	-	-	36,905	-
2013-14	-	-	36,977	-
2014-15	-	-	-	-

*Source:* Economic Survey of Assam, various issues

However, the average population covered by per FPS remained below 1000 throughout this period in the state. From 2011-2012 onward, the Economic Survey of Assam provides number of total FPS in the state without showing rural urban division. It has also not recorded the average number of population per fair price shops since 2011-2012(District wise list of FPSS shop as of 2011-12 is shown in table A4.4).

#### 4.5 ISSUE PRICE OF PDS RICE IN INDIA

The Central Issue Price (CIP) of PDS commodities are fixed by the Central government of India and State Issue Price (SIP) for the PDS commodities in Assam is fixed by the Department of Food Civil Supply and Consumer Affairs on behalf of Government of Assam. While fixing the SIP for PDS commodities, the respective state governments may or may not give subsidy over the CIP. Table 4.4 shows the SIP of PDS rice in different Indian states. The CIP of BPL common rice has been Rs. 5.65 since 2000-01.

The Indian States which carry a heavy state government subsidy on PDS rice for BPL beneficiary households are Andhra Pradesh, Karnataka, Kerala, Madhya Pradesh, Odisha, Sikkim, Tamil Nadu and West Bengal. Gujarat carries a state subsidy for a maximum limit of 3.5 kg of rice per beneficiary household. Assam is the only exception in terms of having different SIPs for the BPL category of households. Instead of a uniform SIP for BPL households, the SIP changes according to geographical location. This is discussed in Section 4.6.

The government of India has directed the state governments to fix the price for AAY rice as equal with the CIP of AAY rice which is Rs3 per kg for 'common variety' of rice and to fix the SIP of BPL rice which should not exceed a maximum of Rs0.50 per kg above the CIP. However no such restriction is imposed on fixation of SIP for APL rice. The CIP for BPL and APL rice has changed from 1997 to 2002 and has remained more or less the same thereafter.

Table 4.4 State Issue Price of PDS rice in different states of India

States	BPL(Common)	AAY (Common)	APL (Grade_A)
Andhra Pradesh	2	2	-
Arunachal Pradesh	6.15	3	8.8
Assam	6.27-6.67	3	9.17-9.43
Bihar	6.78	3	9.14
Chhattisgarh	6.15	3	8.95
Gujarat	3.00 (Max. 3.5 Kg.) 6.70 (2.5 Kg.)	3	-
Himachal Pradesh	6.85	3	9
Jammu and Kashmir	6.25	3	9.6
Jharkhand	6.15	3	8.3
Karnataka	3	3	9.4
Kerala	2	2	8.9
Madhya Pradesh	4.5	3	-
Maharashtra	6	3	9.6
Manipur	6.2	3.47	8.95
Meghalaya	6.15	3	8.80-10.00
Mizoram	6.15	3	9.5
Nagaland	6.15	3	8.3
Odisha	2	2	9.3
Rajasthan	6.3	3	9
Sikkim	4	Free of Cost	9
Tamil Nadu	1	1	1
Tripura	6.15	3	9.6
Uttar Pradesh	6.15	3	8.45
Uttarakhand	6.15	3	-
West Bengal	2	2	9

Source: Indiastat.com, browsed on June 30<sup>th</sup>, 2017.

Note: The Central Issue Price of BPL Common rice has been Rs. 5.65 since 2000-01.

#### 4.6 GEOGRAPHICAL TARGETING AND STATE ISSUE PRICE IN ASSAM

The department of Food Civil Supply and Consumer Affairs, GoA fixes the transportation charge and profit margin for the GPSS and FPSs over CIP and based on that SIP is fixed for BPL and APL rice. The transportation charge was revised three times since January 1987 and profit margin was revised two times. However Assam follows a unique method of

fixation of SIP based on geographical distance between GPSS and FPSs. SIP for rice in Assam is fixed by dividing the districts into Plain area, Riverine area and Hill area and considering the distance between GPSS and FPSs. The distance between GPSS and FPSs is divided into categories of 0-5km, above 5km-10km, above 10km-30km, above 30km-50km, and above 50km. However, the norm of keeping SIP of BPL rice within limit of Rs 0.50 above the CIP of BPL rice has never been followed in the state.

The state government keeps the SIP always open and never gives strict instruction to the GPSS and FPSS to charge a fix SIP from the consumer. Thus the distributing agencies add the rising fuel price in transportation costs and push the burden to the consumers. Such multiple state issue prices create information distortions among the beneficiary households as well as welfare losses (see for example Bedamatta, 2016 for geographical targeting and welfare losses in Odisha). However it needs mention here that while Odisha's geographical targeting during the period of 1990s and early 2000s was based only on tribal and drought prone area programme districts, in Assam geographical targeting is more complex as there is a distance slab as well as a geographical location categorization based on plain, riverine and hill areas.

Table 4.5 shows the SIP for BPL and APL rice since the introduction of TPDS in the state. As the SIP is fixed on the basis of geographical categorisation and distance, the SIP may vary from place to place within a district. The SIP for the above mentioned type of households are above the CIP which shows that GoA has not provided any state subsidy to these households. SIP of rice for AAY households was fixed equivalent to CIP by giving an amount of Rs. 0.30 per kg as a state government transport subsidy. It is disconcerting to know that *there are 15 different SIP for BPL and APL rice in the state.*

Table 4.5 State Issue Price (per kg) for BPL and APL rice in 1995 and 2008

Distance slab (in km)	SIP _ BPL rice, 1995			SIP _ BPL rice , 2008			SIP _ APL rice , 1995			SIP _ APL rice, 2008		
	Plain	Riverine	Hill	Plain	Riverine	Hill	Plain	Riverine	Hill	Plain	Riverine	Hill
0 to 5	6.31	6.32	6.37	6.51	6.52	6.62	8.96	8.97	9.02	9	9.02	9.11
Above 5 to 10	6.33	6.34	6.38	6.54	6.56	6.63	8.98	8.99	9.022	9	9.05	9.13
Above 10 to 30	6.35	6.36	6.4	6.58	6.6	6.68	8.99	9.00	9.05	9.1	9.09	9.18
Above 30 to 50	6.37	6.38	6.42	6.61	6.64	6.71	9.01	9.03	9.06	9.1	9.14	9.21
Above 50	6.38	6.4	6.43	6.64	6.68	6.74	9.02	9.05	9.08	9.1	9.18	9.23

Source: Author's calculation after accounting for profit margin of the fair price shop based on transportation costs.

Table 4.6 shows the CIP and SIP for common rice provided to the BPL households in the state from 1997 to 2015. The upper slot of the table shows the SIP fixed for the BPL common rice from 1995 to 2008. It is clear that CIP for BPL common rice has been changed for 3 times from 1997 to 2001 and remained fixed till 2013-2014. The CIP for BPL common rice was fixed at Rs3.50 per kg from December 1997 to March 2000. From April 2000 to July 2000 it was Rs5.90 per kg. From July 2001 to 2013-2014 it was fixed at Rs 5.65 per kg. On the other hand, state government has fixed 15 different SIP on the basis of geographical location and distance. For plain areas, SIP ranges from Rs. 6.31 per kg to Rs6.38 per kg, for riverine areas Rs6.32 to Rs6.40 and for hill areas ranges between Rs 6.37 to Rs 6.43. This shows that SIP for BPL common rice has been higher than that of CIP for BPL common rice in the state, which implies that there is no state specific subsidy provided to the BPL households in the state over CIP. The lower slot of the table shows the revised SIP rate of BPL common rice from 2008 to till 2015 by following the same geographical categorization.

Table 4.6 State Issue Price (SIP)/ Central Issue Price(CIP) for BPL common rice in Assam, 1995 to 2008

Distance slab (in km)	SIP, 1995 to 2008			Year	CIP
	Plain	Riverine	Hill		
				01.12.1997 to 28.01.1999	3.5
0 to 5	6.31	6.32	6.37	29.01.1999 to 31.03.2000	3.5
Above 5 to 10	6.33	6.34	6.38	01.04.2000 to 24.07.2000	5.9
Above 10 to 30	6.35	6.36	6.4	25.07.2000 to 11.07.2001	5.65
Above 30 to 50	6.37	6.38	6.42	12.07.2001 to 31.03.2002	5.65
Above 50	6.38	6.4	6.43	01.04.2002 to 30.06.2002	5.65
				01.07.2002 to 18.02.2008	5.65
	SIP, 2008 to 2015			Year	CIP
0 to 5	6.51	6.52	6.62	2008-09	5.65
Above 5 to 10	6.54	6.56	6.63	2009-10	5.65
Above 10 to 30	6.58	6.6	6.68	2010-11	5.65
Above 30 to 50	6.61	6.64	6.71	2011-12	5.65
Above 50	6.64	6.68	6.74	2012-13	5.65
				2013-14	5.65

*Source:* The SIP for different geographical slabs has been calculated based on the information provided on transportation costs and profit margins of the fair price shops. Information of CIP is from [www.indiastat.com](http://www.indiastat.com), browsed on 30<sup>th</sup> June 2017.

Table 4.7 shows the SIP and CIP for APL rice in the state from 1997 to 2014. The upper slot of the table shows the SIP fixed for the APL rice from 1995 to 2008 and the lower slot of the table shows the revised SIP rate of APL rice from 2008 to 2015. It is also seen that CIP for APL rice has changed for 6 times from first phase of TPDS introduced in 1997 to second phase of TPDS which was introduced in 2002. From July 2002 onwards CIP for APL rice remained fixed till 2013-2014. The CIP for APL rice was fixed at Rs7 per kg from December 1997 to March 2000. From April 2000 to July 2000 it was Rs11.80 per kg. From July 2000 to July 2001 it was fixed at Rs 11.30 per kg. From July 2001 to July 2002 CIP for APL rice was changed for 3 times. Accordingly SIP for APL rice has been fixed by the state government based on the geographical classification. The SIP remained fixed in this time though CIP has changes several times in both the phases of TPDS. Though both SIP for APL and BPL is higher than CIP in Assam, but it is still lower than average open market price.

Table 4.7 State Issue Price (SIP)/ Central Issue Price(CIP) for APL\_Grade A rice in Assam, 1995 to 2008

SIP , 1995 to 2008				Year	CIP
<i>Distance slab</i>					
<i>(in km)</i>	<i>Plain</i>	<i>Riverine</i>	<i>Hill</i>		
0 to 5	8.96	8.97	9.02	01.12.1997 to 28.01.1999	7
Above 5 to 10	8.98	8.99	9.02	29.01.1999 to 31.03.2000	9.05
Above 10 to 30	8.99	9.00	9.05	01.04.2000 to 24.07.2000	11.8
Above 30 to 50	9.01	9.03	9.06	25.07.2000 to 11.07.2001	11.3
Above 50	9.02	9.05	9.08	12.07.2001 to 31.03.2002	8.3
				01.04.2002 to 30.06.2002	7.3
				01.07.2002 to 18.02.2008	8.3
SIP , 2008 to 2015				Year	CIP
<i>Distance slab</i>					
<i>(in km)</i>	<i>Plain</i>	<i>Riverine</i>	<i>Hill</i>		
0 to 5	9	9.02	9.11	01.07.2002 to 18.02.2008	8.3
Above 5 to 10	9.04	9.05	9.13	2008-09	8.3
Above 10 to 30	9.07	9.09	9.18	2009-10	8.3
Above 30 to 50	9.1	9.14	9.21	2010-11	8.3
Above 50	9.14	9.18	9.23	2011-12	8.3
				2012-13	8.3
				2013-14	8.3

*Source:* The SIP for different geographical slabs has been calculated based on the information provided on transportation costs and profit margins of the fair price shops. Information of CIP is from www.indiastat.com, browsed on 30th June 2017.

#### 4.7 CONCLUSION

Like other states of India, TPDS was introduced in 1997 in Assam and households were divided into BPL and APL based on the official poverty line criterion. The GoA selected 19.06 lakh BPL households based on income targeting in the 1<sup>st</sup> phase of TPDS during 1997 and in second phase selected 7, 04,000 households as AAY beneficiaries from the existing 19 lakh BPL households. Those not identified as either BPL or AAY households were considered as APL. However no income criterion was fixed for the APL households. Currently more than 40 lakh households are identified as APL households in the state. This number of BPL and AAY beneficiary households was constant in official records of the GoA till 2015 (GoA, 2014). It is also the duty of the state government to revise the beneficiary list of APL category by proper monitoring and evaluation and

include or exclude the beneficiaries accordingly, though in practice the state government failed to do so. After the introduction of TPDS, many BPL households were left out from the benefits of PDS, therefore, GoA has decided to introduce a new state specific food distribution policy as MMASY scheme. The GoA selected 15,000 families per Legislative Assembly Constituency and decided to provide 20kg of rice per household in 2010. However the distribution of rice under this scheme has come down and became irregular after initial two years.

Assam follows a unique method of fixation of SIP based on geographical distance between GPSS and FPSs. SIP for rice in Assam is fixed by dividing the districts into Plain areas, Riverine area and Hill areas and considering the distance between GPSS and FPSs. The distance between GPSS and FPSs is divided into different categories of 0-5km, above 5km-10km, above 10km-30km, above 30km-50km, and above 50km. However, the norm of keeping SIP of BPL rice within limit of Rs0.50 above the CIP of BPL rice has never been followed in the state.

The state government keeps the SIP always open and never given any strict instruction to the GPSS and FPSs to charge a fix SIP from the consumer. Thus the distributing agencies add the rising fuel price in transportation costs and push the burden to the consumers. Most importantly, the multiple pricing creates lots of information distortions among people. As the SIP is fixed on the basis of geographical categorisation and distance, the SIP may vary from place to place within a district. Thus there are 15 different SIP for BPL and APL rice in the state. There are indications that the levels of information distortions and leakages are very high. This is validated from the cross section data from the village studies in the following chapters.

## Chapter 5

### **Socio-Economic Composition of Households Excluded from TPDS: Errors of Exclusion in the Study Villages**

Drawing from the theoretical framework of Sen's entitlement approach used in Chapter 1 of this thesis, we know that entitlements play an important role in the capability set of an individual. Public programmes prove to be an important support system to poor households by providing an entitlement to access economic and social benefits inherent in them. Since the TPDS is the single most widely implemented food based welfare programme in Assam, possession of ration cards provide the basic entitlement of food. In the WFP framework of food security assessments, the component of accessibility includes along with income, instruments such as ration card that enables households to be able to access the food. Therefore an assessment of the extent of households covered under the PDS through distribution of ration cards is the first step in ensuring household level food security.

Households that are not in possession of a ration card are thus automatically excluded from the food based welfare programme. If the excluded households are left out of the fold of PDS, while their socio-economic characteristics show that they are facing destitution, then we may consider their not possessing a ration card as a loss of entitlement and thus reduced capabilities. This chapter discusses coverage of TPDS in the two flood and erosion affected revenue villages of Chaudhurirchar and Kumargaon in Dhubri and Jorhat districts of Assam.

Section 5.1 highlights the basic socio-economic characteristics and distinguishing features of different types of card holding and non-card holding households. A comparative picture is drawn among all households based on average Monthly Per Capita Expenditure (MPCE) variable. Construction of MPCE variable is explained in appendix to chapter 6. Section 5.2

is the analysis of the coverage of TPDS programme in the two villages based on the size of operational holdings of the households and occupation of the head of the households. This section also discusses how income targeting has failed with the example of MMASY scheme. Section 5.3 contains discussion on targeting errors in the studied villages. Inclusion and exclusion of beneficiaries based on NFSA 2013 is also discussed. Section 5.4 outlines the pattern of inclusion and exclusion of households in TPDS based on the estimates of NSSO 61<sup>st</sup> quinquennial round report in rural Assam. This section shows that large proportion of households in the state is excluded from TPDS and the village data further validates the NSSO findings. Section 5.5 concludes the chapter.

### *5.1 HOUSEHOLD CHARACTERISTICS BY TYPE OF RATION CARD*

The TPDS came into existence in Chaudhurirchar and Kumargaon revenue villages in 1997. There were four types of ration cardholder households in both the villages during the time of survey. They are AAY, BPL, APL and MMASY.<sup>22</sup> The data explained in this section includes both census and sample data from the household survey. Information on possession of ration card has been collected in the house listing survey and therefore it is available for the entire village. However, the detailed nature of expenditure by the households has been explained based on data collected from 96 sample households.

Table 5.1 shows in Chaudhurirchar village, 34.6 per cent are BPL households, 19.7 per cent are APL households, 15.7 per cent are AAY households, 15.7 per cent are MMASY households and 14.2 per cent are households without any ration cards. On the other hand in

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<sup>22</sup>Ration card details was verified in [http://164.100.128.97/ASSAM\\_PDS/](http://164.100.128.97/ASSAM_PDS/) as available in 01/12/2015 All types of classification is being considered depending upon their PDS entitlement. The AAY, BPL and APL households receive rice, kerosene and wheat from TPDS regularly per month. The APL households do not receive rice regularly per month, MMASY are not receiving any rice since 2014, but receives kerosene and wheat per month. Supply of sugar has been stopped since 2013. The households without any ration cards do not receive any items from PDS.

Kumargaon village 33.4 per cent are AAY households, 19.8 per cent BPL households, 17 per cent MMASY households, 15.4 per cent APL households and 11.7 per cent are households without any ration cards.

Table 5.1 Household characteristics by type of ration cards in Chaudhurirchar and Kumargaon

	Chaudhurirchar					Kumargaon				
	APL	BPL	AAY	MMASY	No card	APL	BPL	AAY	MMASY	No card
Total number of households	25	44	20	20	18	19	23	37	19	13
Proportion of households	19.7	34.6	15.7	15.7	14.2	15.4	19.8	33.4	17	11.7
Average household size	5	5	4	7	4	5	5	4	4	4
Average size of total land owned (in acre)	2.3	0.6	0.4	1.5	0.3	2.2	0.7	1.6	0.7	1.5
Access to proper sanitation	83	63	50	73	50	25	40	50	86	75
Average MPCE	1558	879	528	1544	1021	2264	1607	1592	2075	2578
Average MPCE_food	857	554	278	735	703	1000	922	629	1132	1199
Average MPCE_non food	700	325	249	809	318	1264	685	963	943	1379
Avg_MPCE_cereal	367	210	106	335	298	272	238	156	284	273
Avg_MPCE_non-cereal	487	342	170	397	402	726	681	471	846	923
Share_Expnd_House repairing	21	14	10	20	7	14	28	19	28	15
Share_Expnd_Health	21	20	34	19	42	35	20	25	10	19
Share_Expnd_Edn	9	11	10	12	0	7	3	11	7	5
Share_Expnd_Trans	9	9	13	6	4	9	4	4	8	7

Source: Survey data, 2015

Note: In Kumargaon village, among APL households 2 households have both APL and MMASY cards and among BPL households 1 BPL household has both BPL and MMASY cards. These households are also referred as 'multiple card holders' households while analyzing the data. As the proportion of such types of households is very small (2.7%), therefore no separate category has been made in this table. The results of the first 5 indicators are based on the complete enumeration and results of the rest of the indicators are based on the sample survey.

The average size of AAY and households without any ration cards are lesser than that of the other households in Chaudhurirchar village. Similarly in Kumargaon village AAY, MMASY

and households without any ration cards has the similar as well as the lowest household size. In Chaudhurirchar village, the total land holding size shows that AAY households are the poorest households among the cardholder households. Similarly, the BPL and households without any ration cards are also land –poor households. APL and MMASY households are comparatively better off households. In Kumargaon village, BPL and MMASY households have the lowest landholding size whereas APL and households without any cards are comparatively better off households. However, the AAY households shows a different picture, the reason behind is that the average size of leased-in land is higher than average size of own and self-cultivated land and that is also influenced by the extreme values as some of the AAY households leased-in very high size of cultivable land as compared to other households.

Average MPCE is high for all households in Kumargaon village as compared to Chaudhurirchar village. In Chaudhurirchar village, average MPCE of APL households is highest followed by MMASY and household without any cards. AAY households have the lowest MPCE followed by BPL households. In Kumargaon village, households without any ration cards have the highest MPCE followed by the APL and MMASY households and AAY households has the lowest MPCE and BPL households has the second lowest MPCE. Further, average MPCE on food is highest for APL households and lowest for AAY households. In Kumargaon village the average MPCE on food is not much different among APL, MMASY and households without any ration cards and it is lowest among AAY households. These figures are almost similar in Kumargaon village too. Average MPCE<sub>food</sub> is further divided into average MPCE of cereal and average MPCE non cereal. In Chaudhurirchar village, the average MPCE cereal and average MPCE non cereal has the similar pattern as average MPCE<sub>food</sub>. This has too similar pattern in Kumargaon village. However, all these food expenditure indicators show that AAY households have the lowest

expenditure followed by BPL households. This shows that both these group of households are the poorest households in both the villages.

The non-food expenditure shows that in Chaudhurirchar village average MPCE on non-food is the highest for MMASY and APL households and lowest for AAY households, followed by BPL households. In Kumargaon village, average MPCE on non-food is highest for those households without any ration cards followed by APL households. BPL households have lowest average MPCE on non-food items. AAY households have average non-food expenditure is larger than MMASY households. However the detail figure shows that this is because of higher expenditure on other types of non-food essential such as house repairing, health and education for these households as compared to other households. In both the villages, health expenditure is very high among the AAY households.

Thus it is evident that between the two villages Kumargaon village is comparatively better off than Chaudhurirchar village. Also in both the villages, AAY and BPL households are the poorest households. Though the APL and MMASY household are comparatively better than AAY and BPL households, they cannot be claimed as completely well off households because of very high expenditure on home repairing, health, transportation and education. Further section 5.3 shows that very few households are regular salaried income earning households in both the villages. Moreover, in both the villages, large numbers of population are out of labour force as explained in chapter 3.

## 5.2 COVERAGE OF TARGETED PUBLIC DISTRIBUTION SYSTEM

In Chaudhurirchar village, printed cards were distributed among BPL, AAY and MMASY households. BPL cards were distributed in 1997, AAY cards were distributed among the AAY households in 2002 and MMASY cards were distributed in the 2010. Table 5.2 shows that there are 20 per cent APL households, 34 per cent BPL households, 16 per cent AAY households, 16 per cent MMASY cardholder households and 14 per cent of the households do not possess any ration cards. To understand the basic functioning of the TPDS system in the studied village a comparison has been made about the possession of the ration cards as per main economic assets of size of operational holding of land occupation of the head of the households.

Table 5.2 Possession of ration card by the households in Chaudhurirchar village, 2015

	Number						Per cent					
	APL	BPL	AAY	MMASY	No card	Total	APL	BPL	AAY	MMASY	No card	Total
Male headed	25	32	11	18	12	98	20	25	9	14	9	77
Female headed	0	12	9	2	6	29	0	9	7	2	5	23
Total	25	44	20	20	18	127	20	34	16	16	14	100

Source: Survey data, 2015

Table 5.3 shows possession of different types of ration cards by size of operational holding in Chaudhurirchar village. Among the landless households 7.1 per cent are APL households, 21 per cent households possess BPL cards, 11 per cent possess AAY cards, 5.5 per cent possess MMASY cards and about 4 per cent households possessed no ration cards. Among the marginal landholding households, 12 per cent households are APL households, 13 per cent has BPL cards, 4.7 per cent has AAY cards and 8 per cent has MMASY cards, 6.3 per cent households does not have any type of cards. Among small landholding

households, 2.4 per cent does not have any cards and about 2 per cent has MMASY cards. Among the semi-medium landholding households 2.4 per cent does not have any cards and less than 1 per cent has BPL cards. Among small and semi-medium households there are very less percentage of BPL and AAY households as the proportion of households belongs to these two categories is very small. This implies a large proportion of households are excluded from TPDS as they mainly possessed other types of cards or no cards at all.

Table 5.3 Possession of ration card based on size of operational holding in Chaudhurirchar village, 2015

Size of operational holding (in acres)	Number						Per cent					
	APL	BPL	AAY	MMASY	No card	Total	APL	BPL	AAY	MMASY	No card	Total
< 0.005 [landless]	9	27	14	7	5	62	7.1	21	11	5.5	3.9	49
> 0.005- < 2.47[marginal]	15	16	6	10	8	55	12	13	4.7	7.9	6.3	43
> 2.47- < 4.95[small]	0	0	0	2	3	5	0	0	0	1.6	2.4	4
> 4.94- < 9.88[semi-medium]	0	1	0	1	3	5	0	0.8	0	0.8	2.4	4
Total	24	44	20	20	19	127	19	34.8	15.7	15.8	15	100

Source: Survey data, 2015

Table 5.4 shows possession of ration cards by occupational classification of the head of the households in Chaudhurirchar village. Large proportions of BPL households are petty traders (10.2 per cent), cultivators (8.7 per cent) and out of labour force households (7.1 per cent). Similarly, petty traders households have largest share of AAY cards (5.5 per cent), out of labour force (4.7 per cent) followed by labouring out in non-agriculture (2.4 per cent) and cultivator households (2.4 per cent each). Most common types of households are APL and MMASY households. Salaried households possess APL and MMASY cards. On the other hand agricultural labour households possess APL and BPL cards but no MMASY and AAY cards. 2.4 per cent of such households do not possess any types of card.

Table 5.4 Possession of ration card by type of occupation of the head of the household in Chaudburirchar, 2015

Occupation of household head	Number						Per cent					
	APL	BPL	AAY	MMASY	No card	Total	APL	BPL	AAY	MMASY	No card	Total
Petty traders	4	13	7	5	2	31	3.1	10.2	5.5	3.9	1.6	24
Labouring out in non agriculture	5	7	3	6	7	28	4	5.5	2.4	4.7	5.5	22
Cultivator	6	11	3	5	5	30	4.7	8.7	2.4	3.9	3.9	24
Salaried	4	0	0	1	0	5	3.1	0	0	0.8	0	4
Labouring out in agriculture	3	4	0	0	3	10	2.4	3.1	0	0	2.4	8
Out of labour force	2	9	6	3	3	23	2.4	7.1	4.7	2.4	1.6	18
Total	24	44	19	20	20	127	19.7	34.6	15	15.7	15	100

Source: Survey data, 2015

Table 5.5 shows that in Kumargaon village, 33 per cent households possesses AAY cards, 20 per cent households possesses BPL cards, 17 per cent possesses MMASY cards, 15 per cent possesses APL cards, 3 per cent households possesses multiple cards, 12 per cent households does not have any cards. The households which possess more than one type of cards are categorized as ‘multiple card holders’ households.

Table 5.5 Possession of ration card in Kumargaon village, 2015

	No card	APL	BPL	AAY	MMASY	Multiple cards	Total
Male headed	12	16	17	24	16	2	87
Female headed	1	1	5	13	3	1	24
Total	13	17	22	37	19	3	111
Per cent							
Male headed	11	14	15	22	14	2	78
Female headed	1	1	5	12	3	1	22
Total	12	15	20	33	17	3	100

Source: Survey data, 2015

Table 5.6 shows among the landless groups, 3 per cent households are APL, 4 per cent are BPL, and 7 per cent each are AAY and MMASY households and 4 per cent does not have any cards. Among the marginal landholding households, above 8 per cent are APL, 13.5 per cent are BPL, 23 per cent are AAY, 8 per cent are MMASY, and 3 per cent are multiple cardholder households and 5 per cent does not have any cards. Among the small

landholding class size of households, APL, AAY and MMASY households constitute 1.8 per cent each. The pattern of land distribution shows that 23 per cent of the households are landless or near landless, 63 per cent are marginal landholding households, and 7 per cent each are small and semi-medium size of landholding households.

Table 5.6 Possession of ration card based on size of operational holding in Kumargaon village, 2015

Size of operational holding (in acres)	No card	Number				Multiple cards	Total
		APL	BPL	AAY	MMASY		
< 0.005 [landless]	4	3	4	8	8	0	27
> 0.005- < 2.47 [marginal]	6	9	15	26	9	3	68
> 2.47- < 4.95 [small]	1	2	1	2	2	0	8
> 4.94- < 9.88 [semi-medium]	2	3	2	1	0	0	8
Total	13	17	22	37	19	3	111
		Per cent					
< 0.005 [landless]	4	3	4	7	7	0	24
> 0.005- < 2.47 [marginal]	5	8	14	23	8	3	61
> 2.47- < 4.95 [small]	1	2	1	2	2	0	7
> 4.94- < 9.88 [semi-medium]	2	3	2	1	0	0	7
Total	12	15	20	33	17	3	100

Source: Survey data, 2015

Table 5.7 shows possession of ration cards by occupational classification of the head of the households in Kumargaon. Large proportion of AAY households are petty traders (12 per cent), cultivators (5 per cent) out of labour force households (5 per cent), labouring out in non-agriculture (5 per cent) and households work (7 per cent). The household workers are female household members who are involved in wide ranges of work though not economically productive. Petty trader households have largest share of BPL cards (5. Per cent), labouring out in non-agriculture (5 per cent), out of labour force (3 per cent) and household work (4 per cent). It is seen that salaried households also possess BPL and AAY

cards in Kumargaon village (2 per cent and 1 per cent each). Rest of the households possesses APL and MMASY cards.

Table 5.7 Possession of ration card by type of occupation of the head of the household in Kumargaon, 2015

Occupation of head of household	Number						Total
	No card	APL	BPL	AAY	MMASY	Multiple cards	
Cultivator	1	2	2	5	0	1	11
Household work	0	3	4	8	2	0	17
Self-employed in non-agriculture	0	0	0	0	2	0	2
Salaried person	0	5	2	1	2	0	10
Petty trader	4	1	6	13	3	0	27
Out of the labour force	1	2	3	5	1	0	12
Labouring out in non-agriculture	7	4	5	5	9	2	32
<b>Total</b>	<b>13</b>	<b>17</b>	<b>22</b>	<b>37</b>	<b>19</b>	<b>3</b>	<b>111</b>
Occupation of head of household	Per cent						Total
	No card	APL	BPL	AAY	MMASY	Multiple cards	
Cultivator	1	2	2	5	0	1	10
Household work	0	3	4	7	2	0	15
Self-employed in non-agriculture	0	0	0	0	2	0	2
Salaried person	0	5	2	1	2	0	9
Petty trader	4	1	5	12	3	0	24
Out of the labour force	1	2	3	5	1	0	11
Labouring out in non-agriculture	6	4	5	5	8	2	29
<b>Total</b>	<b>12</b>	<b>15</b>	<b>20</b>	<b>33</b>	<b>17</b>	<b>3</b>	<b>100</b>

Source: Survey data, 2015

### 5.2.1 Discrepancies in the selection of MMASY beneficiaries

After the identification of TPDS beneficiary households in 1995, it was in 2009, the MMASY beneficiary households were again identified by the Gram Panchayats based on income criteria. Usually the Gram Panchayats are the supporters of particular political party and at the village level political identity of a particular household can easily be identified. Two such households in the Chaudhurirchar village reported that they were not provided

MMASY cards, because they supported the opposition of the ruling party. Dissatisfaction was also reported by respondent households of Kumargaon village in the similar ground. Some example on the status of land ownership of MMASY and completely excluded households and multiple cardholding households will give a clear picture about it.

For example, the sample survey data shows that in Chaudhurirchar village, out of total 11 MMASY households, 7 households have their own land and among these households 6 are such households which has regular earning source in a month. The regular earning source includes salaried government service or owner of grocery shop or does some skilled labour. On the other hand, out of 6 completely excluded household only 2 household holds small size of land, remaining 4 households possesses neither any land nor have any regular income source.

The pattern is similar in Kumargaon village, where sample data shows 8 MMASY households and 3 households with no card. Out of 8 MMASY households 5 households have their own operational holding of land, 3 households have regular income source like government job. In opposition to that, among 3 excluded households, one is landless, another one has taken 8 bigha cultivable land on lease and the remaining only salaried household have own land. There are also such households which possessed more than one type of card. These are categorised as 'multiple card holder households' e.g. one APL household has MMASY card too and this household has own land and also has 3 regular salaried adult earning members. This shows the presence of selection bias though at a lesser degree, but this again proved that income targeting always leads to exclusion.

### *5.3 TARGETING ERRORS OF EXCLUSION AND INCLUSION*

Cornea and Stewart (1993) calculated Type I and Type II errors in the implementation of various welfare programmes among poor and non-poor households. In this study

households are classified as more prone to seasonal food insecurity (MP\_SFI) households and less prone to seasonal food insecurity (LP\_SFI) households rather than strict poor and non-poor classification. The classification has made based on two basic economic indicators of the households i.e. possession of total operational holding of land and principal occupation of the member of the household. In the tabular analysis these criteria are named as 'landholding' and 'occupation' in brief. As the studied villages suffer from seasonal food crisis during flood season of the year therefore households are categorised for seasonal food secure and seasonal food insecure. Thus two errors of targeting has been calculated as,

- $N = MP\_SFI^i + MP\_SFI^e + LP\_SFI^i + LP\_SFI^e$

Where, N= total number of sample household

- $MP\_SFI^i$  = More prone to seasonal food insecurity households included in TPDS, in per cent
- $MP\_SFI^e$  = More prone to seasonal food insecurity households excluded from TPDS, in per cent
- $LP\_SFI^i$  = Less prone to seasonal food insecurity households included in TPDS, in per cent
- $LP\_SFI^e$  = Less prone to seasonal food insecurity households excluded from TPDS, in per cent

Thus,

- Error of wrong exclusion is  $= MP\_SFI^e / N = MP\_SFI^e' = \text{Type I}$
- Error of wrong inclusion is  $= LP\_SFI^i / N = LP\_SFI^i' = \text{Type II}$

Size of operational holding of land and principal occupation of the household members are found to be main determinant of the household's economic well being. Therefore these two has been selected as principal criteria to calculate targeting errors in both the villages. Moreover , only BPL and AAY households are considered as TPDS beneficiary households as only these households receives food regularly and other households such as APL, MMASY and households without ration cards are not considered as TPDS beneficiary households while carrying out inclusion and exclusion error exercise. The criteria used in the calculation of targeting errors have been mentioned as follows.

More prone to seasonal food insecurity(MP_SFI)	Less prone to seasonal food insecurity(LP_SFI)
Operational holding of land	
Landless households, households possessing marginal operational holding	Households possessing medium and large operational holding
Principal occupation of the household members	
Small cultivators, hired manual labour in agriculture and non-agricultural sector, wood collectors, petty traders like puffed rice sellers and potters, unemployed	Cultivators having medium size of operational holdings, livestock holders, salaried, self-employed in non-agriculture such as owning a grocery shop, hotel, pharmacy

Table 5.8 Estimates of targeting errors in Chaudburirchar and Kumargaon

<i>Chaudburirchar</i>									
<i>Criterion</i>	<i>MP_SFI<sup>p</sup></i>	<i>MP_SFI<sup>e</sup></i>	<i>LP_SFI<sup>p</sup></i>	<i>LP_SFI<sup>e</sup></i>	<i>N</i>	<i>MP_SFI<sup>p</sup></i>	<i>MP_SFI<sup>e</sup></i>	<i>LP_SFI<sup>p</sup></i>	<i>LP_SFI<sup>e</sup></i>
Landholding	62	51	2	12	127	49	40	2	9
Occupation	56	44	8	19	127	44	35	6	15
<i>Kumargaon</i>									
Landholding	53	41	7	10	111	48	37	6	9
Occupation	51	39	9	12	111	46	35	8	11

Source: Survey data, 2015

Table 5.8 explains the estimates of targeting errors in Chaudhurirchar and Kumargaon village. Table 5.9 shows the Type I and Type II error of targeting in both the studied villages. In Chaudhurirchar village, Type I error is 40 per cent and Type II error is 2 per cent for landholding criteria. Similarly it is type I and type II error is 35 per cent and 6 per cent respectively for occupation criteria. In Kumargaon village, Type I error is 37 per cent and Type II error is 6 per cent for landholding criteria whereas it is 35 per cent and 8 per cent respectively for the occupation criteria. Thus it was seen that ‘exclusion error’ is far higher than that of ‘inclusion error’ in both the studied villages.

Table 5.9 Type I and Type II errors based on the two indicators in the Chaudhurirchar and Kumargaon villages

Criterion	Chaudhurirchar		Kumargaon	
	Type I error	Type II error	Type I error	Type II error
Landholding	40	2	37	6
Occupation	35	6	35	8

Source: Survey data, 2015

The Programme Evaluation Organisation of Planning Commission (2005) draws attention to some crucial points on overall performance of TPDS in general and types and magnitude of the targeting error, extent of leakage and diversion of subsidized foodgrains in particular for 18 states of India. According to this study, not only both ‘inclusion error’ and ‘exclusion errors’ are very high in Assam but also ‘exclusion error’ is the highest in Assam among all other 18 states of India. ‘Exclusion error’ for the state was 47.3 per cent and ‘inclusion error’ was 17.2 per cent. ‘Exclusion error’ is further classified into ‘identification error’ and ‘error due to administrative malpractices’. First type of error arises because of wrong information about household characteristics; wrong methodology used for identification and deliberately excludes some groups by those who are in charge of identification of the households at the grass root level. Second type of error means straightly denying BPL cards to genuine BPL families. Errors based on both of these two classifications are very high in Assam and

'exclusion due to identification error' is reported to be highest in Assam (35 per cent) among all other states. 'Exclusion due to malpractices' was reported as 12 per cent. This type of error shows the level of non-existence of BPL cards with the eligible BPL households despite its entry in the official records which is usually termed as 'shadow ownership'. The first type of classification indicates deprivation of BPL households whereas the second classification indicates in addition to deprivation there is leakage of PDS grain.

Swaminathan (2009) also indicates to the fact that there is high exclusion (87.7) in Assam as most of the households have either APL card or no cards. The percentage is also very high for agriculture labour households (69 per cent) and SC households (81 per cent). Assam is also among those top ranked states having very high 'exclusion error' (11 percent) (*ibid*). Another evaluation study conducted on performance of TPDS in six states of India i.e. Bihar, Assam, Chhattisgarh, Uttar Pradesh, Karnataka and West Bengal shows that 'exclusion error' is the highest in Assam (71 per cent) and lowest in Chhattisgarh (2 per cent) among these states. Inclusion error is highest in West Bengal (47 per cent) and lowest in Bihar (18 per cent). But according to this report number of false card is small in Assam. It is also reported that leakage 'extremely high' is in Assam for APL categories because monitoring and management of TPDS operation is a complete failure in the state (NCAER, 2015). As per this report Assam has been reported as 'historically poor performing' state including UP and West Bengal, Chhattisgarh as 'historically good performing' state and Bihar and Karnataka as 'reviving state' on the basis of the overall performance of the TPDS in these state.

### *5.3.1 Status of inclusion and exclusion after the implementation of NFSA, 2013 in the studied villages*

NFSA 2013 was implemented in the studied villages after my field survey was completed. The NFSA 2013 implementation process and distribution of cards to the households was partially started during the time of survey i.e. May and November 2015. The information on the implementation of NFSA 2013 in the village was derived by conducting a short field trip in August, 2017. In Chaudhurirchar village, there was no inclusion of new cardholder households and earlier BPL, APL and MMASY households were identified as PHs. Thus in Chaudhurirchar village, total number of AAY households is 20 and total numbers of PHs are 109, and households which did not possess any ration cards (18) remained excluded even after the implementation of NFSA 2013. On the other hand in Kumargaon village, apart from the AAY households, all the earlier BPL, APL and MMASY households were included as PHs and above all, other households which did not possess any ration cards before NFSA were also included as PHs. Thus total number of AAY households in Kumargaon village was 37 and total number of PHs was 74. Thus all households are covered within the TPDS frame in Kumargaon village after the introduction of NFSA 2013.

### *5.4 EVIDENCE OF EXCLUSION OF HOUSEHOLDS BASED ON NSSO DATA*

Estimates from NSSO 61<sup>st</sup> round show some important facts about the coverage of TPDS in rural Assam. The following table 5.11 shows that percentage of household with AAY card is less than 1 per cent and percentage of household with BPL card is only 12 per cent in rural Assam. 25 per cent households do not possess any ration card and 63 per cent possess other types of ration card. These 'other types' of cardholder households are mostly APL card holder in the state. The APL allocation in the state is irregular and percentage contribution of overall rice consumption from PDS is also very less in the state.

Table 5.11 *Percentage Distribution of Household by Ration Card Type, 2004-05*

<i>State</i>	<i>AAY</i>	<i>BPL</i>	<i>Other</i>	<i>No card</i>
Andhra Pradesh	2.8	54	16	28
Assam	0.6	12	63	25
Bihar	2.3	15	60	23
Chhattisgarh	4.4	35	32	29
Gujarat	0.8	36	50	13
Haryana	2.6	16	68	13
Jharkhand	3	23	51	23
Karnataka	9.6	42	26	23
Kerala	1.8	28	57	13
Madhya Pradesh	3.3	31	38	28
Maharashtra	4.4	31	46	19
Orissa	2	42	23	33
Punjab	0.1	12	76	12
Rajasthan	2.8	16	78	4
Tamil Nadu	1.5	19	69	11
Uttar Pradesh	2.8	14	65	19
West Bengal	3.2	27	61	8
India	2.9	26.5	51.8	18.7

*Source:* NSS 61<sup>st</sup> round

Table 5.12 shows the percentage of household possessing ration card by types of households and by households belonging to different social groups. Only 30 per cent of the agricultural labour households in rural areas of Assam possesses BPL ration card and only 1 per cent of such households possesses AAY ration card. Nearly 30 per cent of such households do not possess any ration cards and 40 per cent of households possess other cards. Less than 1 per cent of ST households possess AAY card, 10 per cent possesses BPL cards and 19 per cent of such households possesses no ration card at all. Above 70 per cent of ST households possesses other types of ration cards.

Table 5.12 Percentage of households possessing ration card by type of household occupation and by social group

States	Occupation	Social group								
		AAY	BPL	Other	No card	Social Group	AAY	BPL	Other	No card
Assam	Self employed in non agriculture	1.2	16.1	65.3	17.3	ST	0.1	10	70.4	19.5
	Agricultural labour	1.1	30.3	38.9	29.7	SC	1.1	18.1	62.9	17.9
	Other labour	0.3	22.5	44.4	32.7	OBC	0.3	6.7	60.6	32.4
	Self employed in agriculture	0.3	3.9	72.3	23.5	Others	0.7	12.9	61.4	24.9
	others	0.5	6.5	67.7	25.3	All	0.6	11.8	63.1	24.6
All India	Self employed in non agriculture	2.7	25	55	17.4	ST	5	39.6	30.8	24.6
	Agricultural labour	5	43	33.5	18.5	SC	4.4	34.9	43.7	17
	Other labour	4	32	44	20	OBC	2.3	24.5	54.5	18.7
	Self employed in agriculture	1	18	66	15	Others	2	17.3	63	17.7
	others	2	12.7	53.8	31.5	All	3	26.5	51.8	18.7

Source: NSS 61<sup>st</sup> round

### 5.5 CONCLUSION

Various studies show that TPDS coverage is very poor in the state and there is also very high level of exclusion of households in rural Assam (Swaminathan, 2009; PEO, 2005; NCAER, 2015). This chapter shows that large share of households is excluded in both the flood and erosion affected studied villages. In Chaudhurirchar village, 16 per cent households possessed AAY cards, 34 per cent possessed BPL cards and remaining households possessed other types of cards or no cards at all. On the other hand in Kumargaon village, 33 per cent households possessed AAY cards, 20 per cent households possessed BPL cards and remaining households possessed either other types of cards or no cards at all. The estimates on targeting errors shows that there is very high level of 'exclusion error' (type I error) in the studied villages based on the two basic economic parameter of operational size of holding and principal occupation of the households. In Chaudhurirchar village, Type I error is 40 per cent and Type II error is 2 per cent for landholding criteria. Similarly it is type I and type II error is 35 per cent and 6 per cent

respectively for occupation criteria. In Kumargaon village, Type I error is 37 per cent and Type II error is 6 per cent for landholding criteria whereas it is 35 per cent and 8 per cent respectively for the occupation criteria.

The post NFSA estimates shows that in Chaudhurirchar village, there was no inclusion of 'no cardholder' households and earlier BPL, APL and MMASY households were identified as PHs. Thus in Chaudhurirchar village, total number of AAY households is 20 and total numbers of PHs are 109, and households which did not possess any ration cards (18) remained excluded even after the implementation of NFSA 2013. On the other hand in Kumargaon village, apart from the AAY households, all the earlier BPL, APL and MMASY households were included as PHs and above all, other households which did not possessed any ration cards before NFSA were also included as PHs. Thus total number of AAY households in Kumargaon village was 37 and total number of PHs was 74. Thus all households are covered within the TPDS frame in Kumargaon village after the introduction of NFSA 2013.

## Chapter 6

### Role of Targeted PDS in Ensuring Household Cereals Consumption Needs:

#### A Cross Section Analysis

In the preceding chapter we discussed the importance of ration card entitlements and how errors of exclusion can cause an entitlement failure and therefore reduction in capabilities of households in being able to ensure their food security. This chapter discusses the levels of utilization of PDS rice in the study villages. In this context, the focus is on the role and importance of targeted PDS in ensuring the households' cereals consumption needs. There are three major points of discussion in this chapter. First, what are the different sources that ensure availability of rice for household consumption? Secondly, what is the actual level of utilization of PDS rice in the study villages and given the high errors of exclusion and geographical targeting, are their welfare costs? Thirdly, what is the contribution of targeted PDS on household cereal consumption needs?

Section 6.1 provides an overall scenario of utilization of TPDS in rural India and Assam based on NSSO estimates. Section 6.2 provides the different sources of rice consumption in the study villages. Section 6.3 underlines the welfare costs accruing to the households based on the actual quantity utilized from TPDS. Section 6.4 interrogates the differences in price entitled and actually charged through PDS. Sections 6.5 and 6.6 are on review of select studies on impact of TPDS on food calorie consumption, and its contribution to households' cereal consumption respectively.

#### *6.1 UTILIZATION OF TPDS IN RURAL INDIA AND ASSAM: NSSO ESTIMATES*

The NSSO quinquennial round reports on Consumption Expenditure provide State level estimates on households consuming from PDS and other sources, including quantity consumed and the price at which it is consumed. This section provides a comparative

picture of inter-state utilization of PDS rice based on NSSO 61<sup>st</sup> and 66<sup>th</sup> round reports. A comparison of NSSO 61<sup>st</sup> and 66<sup>th</sup> rounds of Indian states in the context of rural Assam is important on two counts. First, these were the most recent estimates available during the period when the thesis was undertaken. Secondly, head count ratio of poverty for rural Assam shows a marginal increase between 2004-05 and 2009-10. Therefore Assam's position vis-à-vis other Indian States on account of dependence on PDS rice bears importance. Table 6.1 shows the percentage of household reported consumption of rice from PDS in a reference month and also share of PDS consumption of rice at the household level from 61<sup>st</sup> round and 66<sup>th</sup> round for rural areas of the country.

In Assam, only 9 per cent households reported consumption of rice from PDS as against 24.4 per cent at the national average in 2004-05. This has increased in 2009-2010 where the percentage of household reporting PDS purchase of rice during a 30 day period was 29.8 per cent for rural Assam and 39 per cent for rural India. For the rural areas, the incidence of PDS purchase of rice was recorded highest in Tamil Nadu (91 per cent) and lowest in Bihar (12 per cent) in 2009-2010. NSSO 66<sup>th</sup> round also provides information on quantity share of PDS rice consumption to total household rice consumption. Household's quantity share of rice consumed from PDS was also very low in Assam as compared national average. Only 11 per cent of rice was consumed from PDS in Assam whereas at the national level it was 23 per cent. This figure is also highest for the state of Tamil Nadu (53 per cent).

Assam has very low percentage of share of PDS purchase of rice in total rice consumption as compared to Tamil Nadu despite being the fact that rice is the main item of cereal consumption. The table also shows from NSSO 66<sup>th</sup> round that cost of PDS rice is higher in Assam as compared to some other rice eating states.

Table 6.1 Percentage of household reported consumption of rice from PDS and from Other Sources in rural areas of India

States	2004-05		2009-2010					
	Households reported consumption (in per cent)		Households reported consumption (in per cent)		Quantity consumed from (in per cent)		Price (Rs. Per kg)	Price (Rs. Per kg)
	PDS	Other sources	PDS	Other sources	PDS	Home grown	PDS	Home grown
Andhra Pradesh	62.2	96	83.9	93	32.9	7.9	2.02	20.5
Assam	9	100	29.8	98.4	11.2	52.1	7.3	16.8
Bihar	1	100	12.2	98.6	5.1	30.8	6	15
Chhattisgarh	21.7	99	67.4	84.8	41.2	31.8	1.9	15.1
Gujarat	31.5	94	33.8	85.6	20.3	11.7	4.1	21
Haryana	0.1	82	0.4	79.1	0.5	27.7	9.4	20.5
Jharkhand	4.4	99	26.4	95	14	31.5	4.5	14.9
Karnataka	58.5	98	74.6	69.8	45	9	3	20.3
Kerala	34.6	98	54.3	90	27.9	1.9	5.1	20.4
Madhya Pradesh	17.9	80	23	76.6	20.1	24.5	4.9	15.5
Maharashtra	27.5	98	46.8	69.2	34.2	18.4	6.2	18.4
Odisha	21.5	98	51.6	90.3	24.8	33.9	2	13.2
Punjab	0.1	74	0.1	79.6	0.1	23.8	20	22.1
Rajasthan	0	41	0.2	50.9	0.3	6.7	15	23.7
Tamil Nadu	78.9	97	91	86.5	52.7	5.1	1.0	20.3
Uttar Pradesh	5.8	96	21.1	87.1	17.6	40.2	4.8	14.6
West Bengal	12.8	99	25.7	98.4	6.3	23.1	2.8	16
all-India	24.4	92	39.2	84.7	23.5	25.1	3.4	16.7

Source: NSS 61st and NSS 66<sup>th</sup> round

NSSO 61<sup>st</sup> round estimates shows average monthly consumption of rice from PDS is more in case of households belonging to lower MPCE class size and also having AAY and BPL cards than that of other households. Table 6.2 explains that the NSSO 66<sup>th</sup> round data shows the incidence of purchase from PDS with MPCE class wise. The lower MPCE class size households consume more from the PDS than that of upper MPCE class size households. The lowest MPCE class size households consume an average of above 16 kg per month from PDS and 42 kg from other sources and the highest MPCE class size households consume 1kg rice per month from the PDS and 56 kg per month from other

sources in rural Assam. It is also clear that the cost of purchase of rice by the lowest income households in Assam is very high (Rs 89.8) as compared to that of national average (Rs.33).

Table 6. 2 *Quantity and value of average monthly household consumption of rice, from PDS and from other sources*

<i>MPCE</i>	<i>Quantity consumed (kg)</i>			<i>Value (Rs.) of consumption</i>		
	<i>Assam</i>	<i>PDS</i>	<i>Other source</i>	<i>Total</i>	<i>PDS</i>	<i>Other source</i>
1	16.6	42	59	89.8	670	760
2	13.2	50	64	96	806	902
3	8.5	55	63	63.3	910	973
4	7.5	51	63	55.9	939	995
5	6.9	56	63	56.2	942	998
6	5.2	55	61	49	925	974
7	5.3	57	63	42.1	1004	1045
8	5.5	51	57	46	885	931
9	1.5	58	60	14.5	1009	1023
10	1.1	55	56	10.9	986	997
All Classes	6.8	54	60	50.1	914	964
<i>MPCE</i>	<i>PDS</i>	<i>Other source</i>	<i>Total</i>	<i>PDS</i>	<i>Other source</i>	<i>Total</i>
1	11.1	24.0	35.1	33.0	340.1	373
2	8.3	24.9	33.3	28.3	367.3	395
3	7.7	22.9	30.6	26.0	350.5	376
4	6.9	23.5	30.5	23.0	369.9	392
5	6.8	22.5	29.3	22.3	363.3	385
6	6.5	21.8	28.4	23.6	361.3	384
7	6.1	21.4	27.6	22.5	364.4	386
8	5.4	19.7	25.1	20.9	351.4	372
9	5.2	19.2	24.5	18.7	361.6	380
10	3.8	16.9	20.7	15.9	345.2	361
All Classes	6.5	21.3	27.9	22.8	357.2	379

Source: NSS 66th round

## 6.2 SOURCES OF AVAILABILITY OF RICE FOR CONSUMPTION IN THE STUDY

### VILLAGES

The monthly consumption of rice data shows that the households of both the villages consume rice from three main sources i.e. open market, home production and FPSs. Table 6.3 shows that in Chaudhurirchar village about 8 per cent households completely depend on PDS for their monthly rice consumption. Above 33 per cent households consumes rice only

from open market and equal percentage of households consumes rice from a combined source of FPS and open market. About 24 per cent of the households consume only home produce rice. None of the households consumes from a combined source of FPSs and home production which means that those households who consumes entirely from PDS do not have home grown stock of food. However, in Kumargaon village, majority of the households i.e. above 33 per cent of households consumes from combined source of FPS and open market. Unlike Chaudhurirchar village, in Kumargaon village a large proportion of households consumes from combined source of FPSs and home production (26.7 per cent). The households which entirely depend on PDS are 4.4 per cent, about 18 per cent of households consume only from home production and about 16 per cent of households consume rice entirely from open market.

Table 6.3 Household consumption of rice from different sources in the study villages

Sources	Chaudhurirchar		Kumargaon	
	Number	Per cent	Number	Per cent
Only from FPS	4	7.8	2	4.4
Only from home produce <sup>23</sup>	12	23.5	8	17.8
Only from open market	17	33.3	7	15.6
From FPS and home production	0	0	12	26.7
FPS and open market	17	33.3	15	33.3
Home production and open market	1	2	0	0
From all 3 sources	0	0	1	2.2

Source: Survey data, 2015

Table 6.4 further shows share of monthly consumption of rice coming from different sources by the types of ration cards in the studied villages. In Chaudhurirchar village, APL households, 43 per cent of monthly consumption of rice is from open market and 57 per

<sup>23</sup>Household consumption of home produce rice is for the month preceding the month of survey. The marginal farm holding households also could have consumed home produced rice because crops were harvested early due to early monsoon and flood during that year. Most of the household can have home produced rice because for only 3 to 4 months and very few household could consume home produced rice throughout the year (survey data, 2015).

cent of monthly consumption of rice is from home production. These households did not get any rice from FPSs. This is similar for MMASY households, though major share of rice consumed by MMASY households comes from open market. 75 per cent of total rice consumed by the MMASY households comes from open market where, 25 per cent of total rice consumed by these households is from home production. The households without any ration cards have to rely completely on open market. The exceptional households are BPL and AAY households. FPSs play a major role providing basic cereal to these households. While FPSs quota cannot fulfill the entire monthly requirement of rice of the households, the additional need of the households are fulfilled by the open market. Very few proportions come from the home produced source. Both BPL and AAY households does not consume any home produced rice.

Table 6.4 *Average share of rice consumed by households by type of ration cards in the studied villages*

<i>Chaudhurirbar</i>					
	<i>AAY</i>	<i>BPL</i>	<i>APL</i>	<i>MMASY</i>	<i>No cards</i>
FPS, in per cent	74	55	0	0	0
Home production, in per cent	0	0	57	25	20
Open market, in per cent	26	45	43	75	60
<i>Kumargaon</i>					
FPS, in per cent	68	58	5	0	0
Home production, in per cent	15	19	60	40	45
Open market, in per cent	17	23	35	60	55

*Source:* Survey data, 2015

This picture is slightly different for Kumargaon village. The APL households get 5 per cent of monthly consumed rice from FPSs, 35 per cent from open market and 60 per cent from home produced. Similarly the BPL and AAY households consume rice from all three sources but these households consumed much lesser amount of home produced rice compare to other households. BPL households consume 58 per cent of rice from FPSs, 23

per cent from open market and 19 per cent from home production. Unlike Chaudhurirchar village, the AAY households of Kumargaon village, consumes comparatively a larger proportion of rice out of home production. AAY household consumes 68 per cent of rice from FPSs, 17 per cent of rice from open market and 15 per cent of rice from home production. The other two types of households i.e. MMASY households and households without having any type of ration cards, consumed rice from open market and home production. MMASY households consume major share of rice from open market whereas card-less households consume major share out of home production. MMASY households consume 60 per cent of rice from open market and 40 per cent of rice from home production. Card-less households consume 55 per cent of rice from open market and 45 per cent of rice from home production. Thus, the BPL and AAY households rely mostly on TPDS for their monthly consumption of rice compared to other households.

Table 6.5 *Average rice (in kg) consumed per capita in the Chaudhurirchar and Kumargaon revenue village*

<i>Chaudhurirchar</i>					
<i>Sources</i>	<i>AAY</i>	<i>BPL</i>	<i>APL</i>	<i>MMASY</i>	<i>No cards</i>
From FPS	8.6	8.07	0	0	0
From home production	0	0	10.7	6.2	2
From open market	3.4	5.1	6.7	7.2	12
<i>Kumargaon</i>					
From FPS	8.5	9.2	1.2	2.2	3.6
From home production	2.4	4.2	8.6	3.84	5.1
From open market	2.5	3.4	3.6	9.02	7.2

*Source:* Survey data, 2015

Table 6.5 shows that average per capita per month consumption of rice from TPDS is 8.6 kg for AAY households and 8.07 kg for BPL households in Chaudhurirchar village. Average per capita consumption of rice is 10.7 kg from home production and 6.7 kg from open market by the APL households and 6.2 kg from home production and 7.2 kg from open

market by MMASY households. Households without any cards consume 12 kg from open market and 2 kg from home production.

In Kumargaon village, the AAY households consume 8.5 kg rice per capita per month from TPDS and BPL households consume 9.2 kg from TPDS. Monthly TPDS consumption was 1.2 kg by APL households, whereas MMASY households had 2.2 kg (not from MMASY cards but from APL card by 'multiple cardholder' households) and no cardholder household had 3.6 kg (this consumption was met by borrowing BPL card) from TPDS.

Thus, TPDS rice is mainly available to AAY and BPL households. Other households consume rice from open market and out of home produce. In Kumargaon village the other cardholder households consumes very few proportion of rice from TPDS as compared to that of Chaudhurirchar village.

### *6.3 UTILISATION OF TPDS RICE: WELFARE COSTS BORNE BY THE HOUSEHOLDS*

Table 6.6 shows the actual amount of food received by the households and price paid for it as against the official entitlement and SIP, in Chaudhurirchar village. This data is based on the recall memory of the respondent households because the BPL and AAY cards were submitted to the block office as the official process of selection of beneficiary for NFSA 2013 was started during the time of survey. However, MMASY cards were in the hands of the households. Moreover, APL households of Chaudhurirchar village never had printed cards. Therefore, APL households were receiving their PDS rice entitlement from list of name and records of the register of the FPSs dealer since 1997.

Rice entitled to the AAY household is 35kg per month and SIP fixed for this category is Rs3 per kg. The actual amount of rice received by the household is 30kg per month at the rate of Rs3 per kg. Official entitlement of BPL rice is 33.33 kg per card. Current SIP fixed for BPL

rice is Rs 6.52 to Rs6.68 for riverine areas. But the actual amount of rice purchased by the BPL household in the village is 30kg at Rs.7 per kg. Thus BPL household received 3.33kg rice land AAY household received 5kg rice lesser than their actual entitlement. The FPSs shop owner of Chaudhurirchar village admitted the selling of 5 kg AAY rice and 3.33 kg BPL rice in open market as logistic cost of transportation at the rate of Rs 16 per kg. It was also seen that APL households did not receive any rice from PDS during the time of survey.

Table 6.6 Official entitlement and Actual amount of PDS items received and price paid for it in Chaudhurirchar village, 2015

Entitlement of PDS items		Actual amount received			
Rice (in kg)		Rice (in kg)			
Types of card	Quantity allotted	CIP (Rs per kg)	SIP (Rs per kg)	Quantity received	Price paid (Rs per kg)
AAY	35	3	3	30	3
BPL	33.33	5.65	6.52 – 6.68	30	7
APL	10	8.3	9.02 – 9.18	9	13.5
MMASY	5	5.65	7	5	7

Source: Government of India (2015), Government of Assam(2014) and Survey data, 2015

However, reported end consumer price for APL rice was also higher than that of SIP. The reason for irregular supply of rice to the APL household is completely ‘supply-driven’ as reported by the FPSs dealer. Most importantly, there was mismatch of information provided by the APL beneficiary respondent and FPSs dealer, where the beneficiaries reported of not having rice for past 4 to 5 months preceding the date of survey, whereas the FPSs dealer responded that APL households were getting rice not regularly but at a certain interval. The following table 6.7 shows the official entitlement and actual amount of TPDS items received by the beneficiary households in Kumargaon village. However, in Kumargaon village, the households had NFSA 2013 beneficiary ration cards, though food distribution under NFSA 2013 was not started during the time of survey.

Table 6.7 Official entitlement and Actual amount of PDS rice received and price paid in Kumargaon village, 2015

Types of card	Entitlement of PDS items			Actual amount received	
	Quantity allotted	CIP (Rs per kg)	SIP (Rs per kg)	Quantity received	Price paid (Rs per kg)
AAY	35	3	3	35	3
BPL	33.33	5.65	6.52 – 6.68	32	7
APL	10	8.3	9.02 – 9.18	9	12
MMASY	5	5.65	7	5	7

Source: Government of India (2015), Government of Assam(2014) and Survey data, 2015

In Kumargaon village, AAY households get their full entitlement of rice but price of Rs 1 higher than that of current SIP where BPL households received 32 kg at Rs. 7 per kg. APL rice is also sold at higher price than current SIP. Although the APL households of this village too do not receive their rice quota regularly but the households reported of having 9kg rice at Rs 12 per kg during the time of survey.

Thus, the current operation of the TPDS system in both the village shows that neither the beneficiary households received their PDS entitlement fully and nor the FPSs strictly followed the SIP fixed for Riverine areas of the state. This happened because of presence of multiple SIPs and keeping SIP open without any mandatory regulation from the government to charge price exact as SIP. Through further investigation, the open market price of BPL and AAY rice was found to be in between Rs16 to Rs 17 and open market price of APL rice was Rs 18 to Rs 20. Therefore by not getting full entitlement, the households were actually losing their food subsidies and households borne it as transport cost.

Assuming that the current market price of that particular PDS rice as the extra transport cost borne by the households, then each beneficiary households are bearing the costs at the following rate,

For AAY households= 5 kg \* Rs 16= Rs 80

For BPL households= 3.33 kg \* Rs 16=Rs. 53.3

For APL households= 1 kg \* Rs. 18= Rs. 18.

If all the costs of all the beneficiaries of a village are added up the final value will be very large. From food entitlement it can be easily seen that the subsidy loss/cost of transport/cost of PDS is much higher in Chaudhurirchar village as compared to Kumargaon village.

In both the studied villages FPSs dealer entered the exact official rates and figures against each beneficiaries, although actual price charged and quantity distributed were different. The reason behind this type of discrepancy is due to lack of initiative for proper monitoring and information updation at a strict time interval.

### *6.3.1 Forced sale of poor quality of wheat in the studied villages*

Apart from rice, small amount of wheat is supplied through TPDS in the state. The quantity entitlement of wheat is 3 kg to 4.58 kg per family at the rate of SIP of Rs 7 to Rs 8 per kg for AAY, BPL and APL households. FPS price for wheat was also Rs 11 which was higher than SIP for wheat. The households purchased wheat at the rate of Rs 20 to Rs 25 per kg from open market, but they do not purchase wheat from PDS. This is entirely because poor quality of wheat supplied through TPDS where the beneficiary households reported that the ratio of wheat and wheat bran is of 50:50. Therefore, 1kg of wheat gives actually 1/2kg of edible wheat after extracting wheat-bran and it has a very bad odor which makes it inedible.

In Kumargaon village, as the households are reluctant to purchase wheat, the FPS owner forcefully sells it to the BPL and AAY households with the condition that the respective households will get full rice entitlement only if they purchase wheat. Thus, BPL and AAY

households are forcefully compelled to purchase wheat in Kumargaon village. Moreover the FPSs faced the same restriction from the GPSS and compelled to purchase wheat from the GPSS. There is a widespread demand for improving the quality of wheat from both beneficiary and FPS owner. Moreover, the households prefer to purchase wheat from open market at a higher price because of increasing demand of wheat consumption as a substitute of rice in many cases. Therefore, it was clear that it is not just a matter of type of food is being supplied but also the quality of that food.

### *6.3.2 Status of utilisation after the implementation of NFSA, 2013 in the studied villages*

*Quantity allocation of rice:* The quantity of rice provided to the AAY households under NFSA 2013 remained fixed at 35 kg per household at the rate of Rs 3 per kg, whereas the PHs were provided 5 kg of rice per person at Rs 3 per kg.

*Entitlement of foodgrain from February 2016 to July 2017 under NFSA:* The amount of rice received by the AAY households was 30 kg per card at the rate of Rs 3 per kg in Chaudhurirchar village post-NFSA period from February 2016 to July 2017. The priority households received 5 kg less than their actual entitlement. However, in Kumargaon village, the actual amount of rice received by the AAY households was 35 kg per card at the rate of Rs 4 per kg and the priority households received 5 kg per person at the rate of Rs 4 per kg. This implies that even though NFSA was implemented, the GPSS and FPSS were charging the same amount as pre-NFSA period, on the justification that their transportation dues were not cleared on time. Therefore, the FPSs dealers are not providing the full official amount of rice to the beneficiaries at the official rate even after post NFSA period till July 2017. This clearly shows that without proper administrative reform, the implementation of NFSA could not guarantee the beneficiaries about their full entitlement of food.

*Full entitlement of foodgrain after July 2017:* Though till July 2017 the FPSs were charging the same rate as prior to NFSA, but after repeated public awareness campaign, the FPSs in both the villages has started distributing full entitlement of foodgrain at the official rate from August 2017. With the implementation of NFSA 2013, the APL and MMASY households gained in terms of foodgrain and SIP whereas, many earlier BPL households had to foregone foodgrains after being PH because of fixation of foodgrains i.e. 5 kg per person.

#### *6.4 DIFFERENCE IN PRICE ENTITLED AND CHARGED THROUGH TPDS*

The FPS owner of Chaudhurirchar village is male and he is also a member of Gram Panchayat. The shop was his sole income source whereas the FPS owner of Kumargaon village is a female and her husband is a government salaried person. Therefore the FPS was not her only source of income. The average monthly income of the FPS owner Kumargaon village is around Rs 5000 with margin and selling the gunny bag whereas the FPS owner of Chaudhurirchar village was reluctant to reply to this.

From the interaction with the households and FPS dealer, it was clear that leakage starts from the GPSS level and finally to the ration shop owner. Except the GPSS secretary, other GPSS members are not regular salaried employees and therefore they are left out with the option of the profits derived from TPDS mechanism for their economic survival. However, in Chaudhurirchar village the sale of rice at the open market, information dissimilarity of the FPS dealer and APL beneficiary households, wrong entry in the register, and statement made by FPS dealer regarding NFSA 2013 that, with the implementation of the act the GPSS and FPSs loose out the APL profit indicates presence of corruption in the distributive mechanism. However, as per the FPSs owner of both the village, their transportation margin is in due for many months. The FPSs dealer of Chaudhurirchar village responded of selling those amounts of APL rice which are not purchased by the beneficiary households.

However, this has serious contradiction with the APL beneficiary households of the village. The FPSs dealer of Chaudhurirchar village also complained about loss in their business because of NFSA 2013 and transforming the APL households into PHs.

It has been widely accepted that corruption has started because of low commission/margin, increasing transportation costs with the regular increase in fuel prices, loading and unloading costs by hired labour, and gratuitous payment like bribes to the government officials for renewal of the registration of dealership, regular monthly payment to the supply inspector/civil supply officer, bribes to the police etc. to the higher authorities. However income sources of the dealers are limited only to the earning from commission/margin and sale of gunny bags (Khera, 2011; Kumar and Mohanty, 2012). The Planning Commission report stated that leakage at the FPS level (10 per cent) is very less in Assam but leakage through ghost card (30 per cent) is very high. It also shows that there is very low financial viability of the FPSs as well as very low net income over recurring costs incurred by FPSs in Assam. In order to have financial viability of the FPSs in the state, Government of India should allot separate financial package (PEO, 2005). It was also found that it is because of the above mentioned reasons there is prevalence of corruption at the studied villages too.

To overcome these problems most cost effective measures will be like allocation of higher amount of margin, regular release of margin on time so that dealers do not require to lift the commodities out of their pocket expenses and above all to stabilize the food prices (Jha et al, 2013). From the informal discussion carried out with the FPSs dealers and beneficiary households, it was observed that many households were not aware of their actual entitlement and problem relating to high end consumer price than the actual SIP. The households expressed their willingness for reforms in the administrative process to ensure the full entitlement of the items with full subsidy.

Apart from this, the main contribution of FPSs dealer of the village was that food distribution to the households takes place at a regular time. Also detail information on food entitlement and its price are mentioned in the FPSs and no households reported any discrimination in terms of the distribution. The dealers also mention that the households purchase the entire amount of rice at one time without any installments. Therefore, it can be said that overall performance of the FPSs in both the villages are satisfactory.

#### *6.5 IMPACT OF TARGETED PDS ON FOOD CALORIE CONSUMPTION:*

##### *REVIEW OF SELECT STUDIES*

Various studies in India have assessed the impact of PDS on household calorie consumption. Kishore and Chakrabarti (2015) found an improvement in diet quality due to increase in cereal subsidy in certain states of India. The study was carried out by dividing the states as 'treated'(Andhra Pradesh, Chhattisgarh, Tamil Nadu, Odisha and West Bengal where rice was supplied to the majority of their population at a very low price by using the state's own budgetary resource) and 'non-treated' (other than the above mentioned states) groups. An average of 3kg more rice per month was purchased by the households of the treated states than their non-treated counterparts due to a more inclusive TPDS policy.

In Chhattisgarh, money saved out of rice was used to purchase pulses, vegetables, edible oil and sugar which had positive impact on household level nutrition. This study found a positive impact of increase in TPDS subsidy on calorie intake and dietary quality of the households. The study emphasized on ensuring better performance of TPDS. It further recommended that without carrying out administrative reforms to deal with widespread corruption, progressive policies such as NFSA may not be successful. Similar studies on TPDS having significant impact on household food consumption are also concluded in

Mahadevan and Suardi (2013), Rahman (2014, 2016), Bhattacharya et al, (2016) based on NSSO data, primary surveys used in the studies of Khera (2011) and Chatterjee (2014).

However contradictory results also emerge that show TPDS not having significant impact on household food consumption. For e.g. Tritah (2003) explained that the benefit of the food subsidy accrued to the poor, generates more food expenditure than generating real income, therefore, suggested a new method of poverty estimation as 'food equivalent poverty line'. Similarly, Kochar (2005) concludes that very small number of poor could avail TPDS subsidies and also the elasticity of calorie intake with respect to the value of food subsidies are very low for rural households because of shortfall in the quantities of food purchased by the households than their actual entitlements.

Another reason for the poor performance of the TPDS was low financial support by the government. However, the scholar mentions that it was because of the number of beneficiaries were reduced which led to fall in the optimal amount of FPS procurement, had an adverse effect on the food supply of BPL households after the economic reforms process. Other reasons behind this relative failure of TPDS as mentioned may be the process of decentralization where village level functionaries play pivotal role in identifying beneficiary households. However, that needs proper cross sectional evidence; in the absence of which, the author is more positive about 'regional targeting'.

Kaushal and Muchomba (2013) draw similar conclusion but for two groups of districts. One group is that where wheat and rice are staple food and the other group is that where coarse grains are the staple food. It was found that increase in income resulting from the food price subsidy changed the consumption pattern but had no positive effect on nutritional level being measured by per capita calorie intake. Therefore, the income transfer resulting from increase in food price subsidy changed the consumption pattern of the rural households

towards subsidized but more expensive source of nutrition like wheat and rice and shifts away from the non-subsidized cheap coarse grain. Khera (2011) explained various aspects of the working of the TPDS in Rajasthan through primary data collected from eight villages of four districts from a random sample of 388 households. It was found that one third of the sample households did not utilize their full quota. She used the 'dual pricing model' to address the problem of under purchase of TPDS commodities.

Table 6.8 shows some of the selected studies which measure the impact of TPDS on household food security. Most of the studies are on NSSO data with panel data analysis except few primary studies. The dependent variables used in most of the studies are per capita cereal consumption, households' quantity of rice consumed, per capita per day calorie intake and implicit subsidy from PDS. However, per capita consumption does not take into consideration intra-household food distribution. In order to adjust it Mahadevan and Suardi (2013) suggested 'calorie gap' which is an adjusted value of per capita with NSSO consumer unit.

Bhattacharya et. al (2016) also used consumer unit with National Advisory Council's (NAC) recommendations of 7 kg cereal per capita per month and calculated foodgrain deviation from 7 kg. This deviation is taken as proxy to measure food security of the households. However, this 7 kg is an undervaluation for a rural manual labourer and can be considered as a minimum need. In order to study how different ration cardholder households respond to this minimum requirement, 'foodgrain deviation' is taken as a dependent variable.

Table 6.8 :Some of the selected studies examining the role of PDS in household food security

<i>Study</i>	<i>Data source and method</i>	<i>Dependent Variables</i>	<i>Independent variable</i>	<i>PDS impact</i>
Tritah, 2003	Cross section, NSSO 55th round, propensity score matching	Real income transfer	Age, educational level, household asset ownership position, land owned, household size, income source of the household, access to electricity, social group, source of fuel	+, not significant
Kochar, 2005	Panel data, NSSO 50th (1993-94) and 55th (1999-2000) round, OLS and Instrumental Variable	Per capita calorie intake	PDS subsidy, BPL households, price of PDS rice and wheat	not significant
Swaminathan, 2009	Cross section, NSSO 61st round	N/A	N/A	High exclusion error
Khera, 2011	Cross section, PDS survey, OLS, Quantile and Tobit	Per capita cereal consumption	PDS subsidy, BPL households, price of PDS rice and wheat	Under purchase of commodities are demand driven
Jha et al, 2013	Cross section, Primary survey, 2007-2008, OLS and Tobit regression	Implicit subsidy	Waiting time at FPS, land owned, land gini, proportion of BPL cardholders, ratio of PDS to market price, geographical distance, adult population, wage rate	+, not significant
Kaushal and Muchomba, 2013	Panel data, NSSO 50th (1993-94) and 55th (1999-2000) thick round, OLS and IV	Per capita per day calorie intake	ration card dummy, MPCE, consumption of cereal and non-cereal in pre-TPDS expansion and Post-TPDS expansion period,	0
Mahadevan and Suardi , 2013	Cross section, NSSO thick round, OLS and Quantile regression	Calorie gap	Household size, female headed household, literacy status, land per capita, occupation, caste, religion, ration card dummy	+ significant

Kishore and Chakrabarti, 2015	Panel data, NSSO 61st (2004-05) and 66th (2009-2010) thick round, difference in difference	Quantity of rice consumed	PDS coverage, Per capita PDS purchase of ration cardholder households and non-ration card holder households, Average price for rice from FPSs, leakage	+, significant
NCAER, 2015	Cross section, targeting errors	N/A	N/A	High exclusion error in non-NFSA state
Bhattacharya et al, 2016	Panel data, NSSO thick round, Quantile regression	Foodgrain deviation	Effective subsidy, real income transfer, Food diversity index, real MPCE, Socio religious dummy	+, significant
Bedamatta, 2016	Time series, Cross section, Government of Orissa, 1980's to 2013, GoI, primary data, targeting errors	Long term view of state specific PDS policy in Odisha	N/A	Geographical targeting leads to large scale welfare losses among the poorest households and information distortion at the ground level

*Source:* Compiled by the author from various studies  
Note: N/A implies not applicable

## 6.6 CONTRIBUTION OF TARGETED PDS TO HOUSEHOLD CEREAL CONSUMPTION NEEDS: AN OLS AND QUANTILE REGRESSION

An OLS and quantile regression analysis has been carried out to explain factors that contribute to deficiency in foodgrains consumption at the household level. Foodgrains deficiency here means the difference in actual level of consumption from a norm. The norm of cereals consumption considered in this analysis follows the NAC specification as carried out by Bhattacharya et al (2016).

A pooled Quantile regression has been calculated to study the effect of the explanatory variables on *FD<sub>ev</sub>*. Quantile regression measures the effects of explanatory variables across the distribution of dependent variable. Justification for using Quantile regression is that it gives a significantly different coefficient from OLS coefficient which means OLS coefficient

efficient is outside the Quantile regression co efficient confidence interval, when there is heteroscedasticity in the data. Breusch/Pagan test is conducted to check the presence of heteroscedasticity in the pooled data which shows the value of chi square is 6.23 and the p-value for it is 0.0123 which is less than 0.05 and because of this the quantile regression measure has been adopted to see the difference of impact of explanatory variables across different quantiles of the dependent variable.

Breusch/Pagan test is being conducted to check the presence of heteroscedasticity for Dhubri which shows the value of chi square is 0.89 and the p-value for it is 0.346 which is more than 0.05 and because of this the quantile regression measure has not been adopted to see the difference of impact of explanatory variables across different quantiles of the dependent variable in Chaudhurirchar village. However, Breusch/Pagan test for Kumargaon shows the value of chi square is 25.31 and the p-value for it is 0 which is less than 0.05 and therefore the quantile regression measure has been adopted for Kumargaon village.

OLS models the relationship between explanatory variables and conditional mean of y variable whereas Quantile regression measures the relationship between explanatory variables and conditional quantiles of 'y' variable rather than just conditional mean of y variable. OLS regression equation can be written as,

$$\begin{aligned}
 FDev_{ij} = & \alpha + \beta_1 OH\_Land_{ij} + \beta_2 FDI_{ij} + \beta_3 MPCE_{ij} + \beta_4 Adult\_literate_{ij} \\
 & + \beta_5 ICDS\_dummy_{ij} + \beta_6 MDM\_dummy_{ij} + \beta_7 Ration\ card\_dummy_{ij} \\
 & + \beta_8 Vill\_dummy_{ij} + \epsilon_{ij}
 \end{aligned}$$

Where  $FDev_{ij}$  is the foodgrain deviation of  $i$ th the household for  $j$ th village. The empirical specification of Quantile regression can be written as,

$$FDev_i = X_i' \beta_q + e_i$$

Where,

$X_i'$  is the vector of determinants of the foodgrain deviation

$$(\beta_q) = \sum_{i:Fev \geq X_i' \beta}^N q |FDev_i - X_i' \beta_q| + \sum_{i:Fev \leq X_i' \beta}^N (1 - q) |FDev_i - X_i' \beta_q|$$

In case of above mentioned equation, the weighted absolute value of the residuals is minimized unlike OLS where the sums of the squared residuals are minimized. For the  $j$ th regressor, the marginal effect is the coefficient for the  $q$ th quantile.

$$\frac{\partial Q_q (FDev_i | X)}{\partial x_j} = \beta_{qj}$$

*The dependent variable*

Following Bhattacharya et al. (2016), the impact of TPDS is measured by the dependent variable foodgrain deviation. Foodgrain deviation ( $FDev$ ) is deviation of the actual consumption of foodgrain of the household from the required threshold limit. The threshold limit is based on National Advisory Council's (NAC, 2011) standard monthly per capita consumption norm of foodgrain. NAC's recommendation is that monthly requirement of foodgrain is at least consumption of 7kg of cereal per capita per month for

an adult member. Therefore, NAC's 7kg cereal per capita per month is converted into NSSO consumer unit, adjusting the food requirement across sex, age and activity level. (See NSSO, 2009-2010 for measurement of consumer unit). Thus, the NAC's 7kg per capita per month threshold is converted into per consumer unit following the formula:

- $FDev = 7\text{kg} * \text{Average consumer unit of the household} = x$  ; where average consumer unit = total consumer unit of the households/total size of the households

Thus,  $FDev = \text{Actual amount of rice consumed per consumer unit} - x$ , where rice per consumer unit is = *total rice consumed by the household / total consumer unit of the households* or in other words, Fdev is how much more/less quantity of rice(in kg) consumed by a person than the threshold limit of the household per month. So if it is  $>0$  , then the household is relatively food secure, and if  $FDev \leq 0$ , then the household is food insecure. It is a normalized figure for monthly per capita consumption of rice.

Table 6.9 Description of variables used in the regression model

Serial no	Variable description used in the regression model	
0	FDev	Dependent variable
1	OH_Land	Size of operational holding of land
2	FDI	Food diversity index
3	MPCE	Monthly per capita expenditure
4	Adult_literate	Number of adult literate member
5	ICDS dummy	1 = if ICDS beneficiary, 0 otherwise
6	MDM dummy	1 = MDM beneficiary, 0 otherwise
7	RC_1	1= if the households have AAY cards, 0 otherwise
8	RC_2	1= if the households have BPL cards, 0 otherwise
9	RC_3	1= if the households have APL+MMASY cards, 0 otherwise
10	RC_4	1= if the households have no cards, 0 otherwise
11	Vill_dummy	1=Kumargaon and 0 = Chaudhurchar

Note: Variables 1 to 11 are independent variables.

*The independent variables*

*Size of operational holding of land:* The size of operational holding is the main determinant of food security of the rural households. There is positive relationship between households' foodgrain security and size of operational holding.

*Food Diversity Index (FDI):* The main objective of the measurement of dietary diversity is to assess the typical dietary pattern of the household or individuals or to assess food security situation of rural agricultural based societies. This method is fruitful in investing the seasonality of food security (FAO, 2013). This brings out the importance of welfare intervention programme during the greatest period of food shortage such as immediately prior to harvest or after emergencies or during natural disaster (*ibid*). Food Diversity will show the seasonality of food security in both the flood affected villages. Food Diversity Index measured by the following formula,

$$h_i = -\sum_{j=1}^k p_{ij} \ln(p_{ij})$$

Where,

k = no of food groups

$p_{ij}$  = Proportion of population or  $n1/N$

The range of FDI is between '0' and  $\ln n$ . higher value of index implies more diversified food consumption by the households. Here, nine categories of food is considered following the same justification as mentioned in Bhattacharya et al (2016). These nine categories of food groups includes- cereals, pulses, non-vegetarian foods like meat and fish, seasonal vegetables, milk, fresh fruits, sugar products, edible oil and salt. Thus value of Entropy Index is bounded between '0' and 2.197 as  $n=9$ .

*Monthly Per Capita Consumption Expenditure (MPCE):* MPCE is the proxy income variable of the household. MPCE is the sum total of MPCE for food and non-food. The reference period for food consumption and expenditure is 30days and reference period for non-food expenditure is 365 days 9(see table A6.1 for the calculation of MPCE in the studied villages). The relationship between MPCE and *FDev* can be both positive and negative. The response of MPCE to total *FDev* has been a widely debated argument since long time back. But the general calorie consumption puzzle and food budget squeezing argument may not hold true for cross sectional studies. It is still more cereal laden food budget of the households, particularly when there is poverty, lack of employment opportunities and seasonal food insecurity. Therefore the MPCE is expected to have a positive relationship with *FDev*.

*Number of adult literate members in the household:* This variable is the sum total of total adult literate member in the households. There is a negative relation between this variable and cereal consumption of the households as it is assumed that with the increase in education level, people tend to do less manual work and therefore cereal consumption comes down (Khera, 2011).

*ICDS and MDM dummy:* To see the effect of ICDS and MDM on household's food consumption pattern dummy variable has created for the ICDS and MDM beneficiary households. ICDS provides rice, cooked meal and SNP to the beneficiaries whereas MDM provides cooked meals to the beneficiaries.

*Ration card dummy:* The variable description of the ration card dummies are explained in table 6.9. The results are discussed in terms of the reference group is RC\_3 variable, where the performance of the other card holder households are seen in terms of this group of households as these households are more foodgrain secure households.

*Village dummy*: As the Kumargaon village is comparatively better off than that of Chaudhurirchar village; therefore Kumargaon village is taken as reference group. Therefore village dummy is =1 for Kumargaon village and =0 for Chaudhurirchar village.

For the purpose of regression, along with the sample households (51 in Chaudhurirchar and 45 in Kumargaon), I have also considered some households purposively from the houselisting data. I consider them as a sub-sample. They are 8 households from Chaudhurirchar and 7 from Kumargaon. Therefore the total numbers of households that are used in this regression analysis are 59 and 52 in Chaudhurirchar and Kumargaon respectively (see Table 6.10).

Table 6.10 *Selection of sub sample households for pooled regression analysis*

<i>Sample villages</i>	<i>Sub sample households(landless, do not possess any types of cards, agriculture labour and casual labour )</i>	<i>Total number of observations</i>
<i>Chaudhurirchar</i>	8	51+8=59
<i>Kumargaon</i>	7	45+7=52
Total household	15	59+52=111

#### *6.6.1. Results and discussion: pooled regression*

In the Quantile regression model, 25<sup>th</sup> quantile is the lowest quantile, 50<sup>th</sup> is the median quantile and 75<sup>th</sup> is the highest quantile class of the dependent variable *FD<sub>ev</sub>*. The 25<sup>th</sup> quantile class is the most foodgrain insecure class and 75<sup>th</sup> quantile is the least foodgrain insecure class. For pooled Quantile regression the key variable is ration card dummy where the reference variable is RC\_3 or households having APL cards and MMASY cards which are comparatively well off households in some form or other. The results of the other categories of households are interpreted in terms of the RC\_3 variable.

However BPL households show positive and significant contribution in 50<sup>th</sup> and 75<sup>th</sup> quantile. But, it has not shown significant impact on lowest quantile which means that BPL

allocation is not sufficient for the most food insecure households. The RC\_4 dummy shows negative and significant for OLS as well as for 25<sup>th</sup> and 50<sup>th</sup> quantile which shows that the most food insecure household needs some kind of intervention which does not have any types of cards.

Table 6.11. Pooled Quantile Regression for the dependent variable FDev

	Quantiles			OLS
	25 <sup>th</sup> quintile	50 <sup>th</sup> quintile	75 <sup>th</sup> quintile	
OH_Land	.579*	0.00738**#	1.1 **	0.084**
	-0.001	-0.003	-0.003	-1.87
FDI	-2.52	-1.68	-4.3	-5.97
	-1.3	-2.43	-2.4	(-2.18)
MPCE	0.002519*	0.002137**#	0.003529**	0.002614***
	-0.0005	-0.0008	-0.35	-0.001
Vill_Dummy	-1.5	-1.94976	-2.6358	-1.08395
	-0.73	-1.28	-1.27	-1.2
Adult_literate	-0.05	-0.339	-0.93	-.8021849*
	-0.11	(-0.70)	(-1.05)	(-1.52)
ICDS_dummy	1.3	1.2	1.6	2.248*
	-0.79	-0.91	-0.67	-1.52
MDM_dummy	-1.08	-3.35**	-4.07*	-3.9**
	(-0.74)	(-2.01)	(-1.49)	(-2.80)
Ration card dummies				
RC_1	0.4	1.2	-0.04	1.3
	-1.1	-2.2	-2.23	-0.64
RC_2	0.31	2.1 *	4.2*#	2.85
	-1.1	-1.8	-1.9	-1.61
RC_4	-7.66 ***	-6.4**	-4.1	-5.578 **
	(-3.39)	(-3.35)	-1.5	(-2.79)
Constant	1.98**	3.15**	6.43***	4.56
	-1.1	-1.7	-1.48	-2.87
Pseudo- R <sup>2</sup>	0.26	0.39	0.17	R-square = 0.29**
N	111			

Source: Survey data, 2015

Notes: Absolute value of t statistics, based on robust standard error in parentheses, \* significant at 10 per cent, \*\* significant at 5 per cent, \*\*\* significant at 1 per cent. # represents significantly different quantile regression coefficient from OLS coefficients

The other important explanatory variables are OH\_Land, FDI and MPCE and dummy for the ICDS and MDS beneficiary households. The variable OH\_Land is positive and significant for OLS and all the quantiles which implies that possession of land has positive and significant impact on household foodgrain security for all the households. Similarly the MPCE variable also shows positive and significant effect on household's foodgrain security

for both OLS and all the quantile class of foodgrain deviation implying that an increase in MPCE also increases the household's food security.

The variable *Adult\_literate* has negative and significant value with 10 per cent level of significance for OLS, but not significant for any of the quantiles. The *ICDS\_dummy* shows positive and significant at 10 per cent level of significance for OLS, but it shows no significant impact on any of the quantile class. However the *MDM\_dummy* shows negative and significant impact for OLS and 50<sup>th</sup> and 75<sup>th</sup> quantile of foodgrain deviation class.

Table 6.12 *Multicollinearity test for the dependent variables*

<i>Variable</i>	<i>VIF</i>	<i>1/VIF</i>
FDI	2.48	0.404
MPCE	2.36	0.423
OH_Land	1.38	0.727
Adult_literate	1.28	0.778
RC_4	1.8	0.556
RC_1	1.67	0.600
RC_2	1.55	0.646
MDM_dummy	1.3	0.772
ICDS_dummy	1.42	0.703
Village_dummy	1.32	0.758
Mean VIF	1.70	

#### 6.6.2 *Village wise quantile and OLS regression*

Table 6.13 shows the results for Chaudhurirchar village where *RC\_4* has negative and significant value which implies that these households are food insecure as compared to *RC\_3* households. The variable *MPCE* also has positive and significant impact on foodgrain security of the households. However, the variable *MDM* shows a negative and significant impact on the foodgrain security of the households. The impact of *MDM* however cannot

be generalised in this case because only a fraction of population is considered. Similar explanation also implies in case of ICDS households too.

Table 6.13 *Determinants of FDev in Chaudburirchar village*

OH_Land	0.39
	(-0.83)
FDI	2.08
	(-0.63)
MPCE	.0024**
	(-1.73)
Adult_literate	-0.43
	(-0.88)
ICDS_dummy	0.94
	(-0.64)
MDM_dummy	-3.6*
	(-2.62)
RC_1	-3.3
	(-1.45)
RC_2	1.5
	(-0.87)
RC_4	-4.98*
	(-0.008)
N	59
R-square	0.47

*Source:* Survey data, 2015

Absolute value of t statistics, based on robust standard error in parentheses, \* significant at 10 per cent, \*\* significant at 5 per cent, \*\*\* significant at 1 per cent.

Table 6.14 shows that the key variable RC\_1 shows positive and significant impact on household foodgrain security in 25<sup>th</sup> quantile. This may be due to the reason that households in the most food insecure category get the most benefits from TPDS. Another reason may be because of full entitlement of the AAY rice in Kumargaon village. Similarly, the RC\_2 variable shows that it is significant for OLS, 75<sup>th</sup> and 50<sup>th</sup> quantile than their respective RC\_1 groups. The RC\_4 dummy is negative and significant for OLS and 25<sup>th</sup> and 50<sup>th</sup> quantiles.

Table 6.14 *Determinants of FDev in Kumargaon village*

	Quantiles			OLS
	25th quintile	50th quintile	75th quintile	
OH_Land	.411*	1.05**	2.29**	1.2
	-1.37	-1.76	-2.08	-1.3
FDI	-5.1**	-8.4**	-8.06	-1.2**
	(-2.53)	(-2.08)	(-0.96)	(-2.04)
MPCE	0.002***	0.003***#	.004**	0.003**
	-3.47	-2.72	-1.86	-2.53
Adult_literate	0.34	-0.41	-1.47	-2.1**
	-0.65	(-.48)	(-0.79)	(-1.79)
ICDS_dummy	1.8*	3.07 *	3.4	2.8
	-1.39	-1.46	-1.03	-1.03
MDM_dummy	0.16	-0.3	-0.74	-2.3
	-0.15	(-.15)	-0.26	(-8.9)
Ration card dummies				
RC_1	2.5*	3.42	5.8	7.5
	-1.54	-1.2	-1.56	(0.71)
RC_2	1.6	5.2**	6.1**	5.64*
	-0.86	-1.79	-1.96	-1.55
RC_4	-7.96***	-8.8**	-5.6	-9.1**
	(-4.48)	(-2.70)	(-0.81)	(-2.16)
Constant	5.5**	9.7 **	8.31	17***
	-2.24	-1.7	-0.88	-2.79
Pseudo- R <sup>2</sup>	0.44	0.33	0.26	R-square = 0.35**
N	52			

Source: Survey data, 2015

Notes: Absolute value of t statistics, based on robust standard error in parentheses, \* significant at 10 per cent, \*\* significant at 5 per cent, \*\*\* significant at 1 per cent. # represents significantly different quantile regression coefficient from OLS coefficients.

This result again indicates that these households need major food intervention. The variable OH\_Land has positive and significant impact for all the quantiles. Similarly, the value of FDI shows negative and significant impact on *FDev* in OLS, 25<sup>th</sup> and 50<sup>th</sup> quantile which implies that households with low foodgrain security has to sacrifice cereals if they want to have other non-cereal food. However, the MPCE variable is significant for all the quantiles and OLS. The variable ICDS\_dummy is positive and significant only at 25<sup>th</sup> and 50<sup>th</sup>

quantile which means that households which are more prone to foodgrain insecurity also gets most of benefits from ICDS.

### *6.7 CONCLUSION*

The NSSO 61<sup>st</sup> and 66<sup>th</sup> round estimates shows that at all India level, the households reported consumption from PDS is very low in Assam. Moreover, the NSSO 66<sup>th</sup> round estimates shows that the cost of PDS rice is relatively higher in Assam as compared to some other rice eating states, despite of that the lower MPCE class size households consume more from the PDS(16kg) than that of upper MPCE class size households(1kg). From the village data, it is clear that very few households can entirely rely on PDS rice for their monthly consumption because PDS rice cannot give them month long food support. Therefore the households have to rely either on open market or home grown stock of rice. However, in both the village majority of the households are marginal landholding households and their home grown stock lasts only for 2 to 3 months in a year. Therefore households rely on combination of all sources for their monthly rice consumption. In both the villages TPDS rice is mainly available to AAY and BPL households.

The TPDS system of the both the village shows that neither the beneficiary households received their PDS entitlement fully and nor the FPSs strictly followed the SIP fixed for riverine areas of the state since the starting of the programme in both the villages. This happened because of the presence of multiple SIPs and keeping SIP open without any mandatory regulation from the government to charge price exact as SIP. Therefore, in both the villages the households bear a large welfare cost for the consumption of TPDS rice. The welfare cost is more in Chaudhurirchar village than that of Kumargaon village. This welfare cost was borne by the households even after the implementation of NFSA in December 2015 to July, 2017. There is a clear indication towards the existence of corruption from the confession of FPS dealer about the sale of PDS rice at the open

market, information dissimilarity of the FPS dealer and APL beneficiary households, wrong entry in the register of the FPSs dealer, and statement made by FPS dealer regarding NFSA 2013 that with the implementation of the act the GPSS and FPSs will lose out the APL profit are the cases of presence of corruption in the distributive mechanism.

The pooled quantile and OLS regression explaining the factors affecting the foodgrain deviation (*Fdev*) shows that BPL households have positive and significant contribution in 50<sup>th</sup> and 75<sup>th</sup> quantile class of *Fdev*. But it has not impact on lowest quantile, which means that BPL allocation is not sufficient for the most food insecure households. The RC\_4 dummy is negative and significant for OLS as well as for 25<sup>th</sup> and 50<sup>th</sup> quantile class of *Fdev*, which means that households which do not have any types of cards are more food insecure. The other important explanatory variables are OH\_Land, FDI, MPCE, dummy for the ICDS and MDM. The variable OH\_Land is positive and significant for OLS and all the quantiles which implies that possession of land has positive and significant impact on household foodgrain security for all the households across most food insecure class to the most food secure class. Similarly the MPCE variable also shows positive and significant effect on household's foodgrain security for both OLS and all the quantile class of *FDev*, implying that an increase in MPCE leads to increase in food security for all classes. The ICDS\_dummy is positive and significant for OLS, but it shows no significant impact on any of the quantile class. This may be due to universal coverage of ICDS in both the villages. The MDM\_dummy shows negative and significant impact for OLS and 50<sup>th</sup> and 75<sup>th</sup> quantile of *FDev*. The variable Adult\_literate has negative and significant for OLS, but not significant for any of the quantiles.

In Chaudhurirchar village, only three variables are showing significant relationship with the Fdev, i.e. RC\_4, MPCE and MDM\_dummy. RC\_4 has negative and significant value which implies that the households which do not possessed any ration cards are relatively food insecure households than the reference group of households. The variable MPCE also has positive and significant impact on foodgrain security of the households. The variable MDM shows a negative and significant impact on the foodgrain security of the households. The impact of MDM however cannot be generalised in this case because only a fraction of population is considered.

In Kumargaon village, RC\_1 is positive and significant at 25<sup>th</sup> quantile of Fdev. This may be due to the reason that households of most food insecure class get the most benefits from TPDS through AAY cards. Another reason may be because of full entitlement of the AAY rice in Kumargaon village. Similarly, the RC\_2 variable shows that it is significant for OLS, 75<sup>th</sup> and 50<sup>th</sup> quantile. The RC\_4 dummy is negative and significant for OLS and 25<sup>th</sup> and 50<sup>th</sup> quantiles. This result again indicates that the households without any ration cards are most food insecure and they need major food intervention. The variable OH\_Land has positive and significant impact for all the quantiles but OLS. Similarly, the variable FDI shows negative and significant impact on FDev in OLS, 25<sup>th</sup> and 50<sup>th</sup> quantile which implies that households with low foodgrain security have to sacrifice cereals if they want to have other non-cereal food. The MPCE variable is positive and significant for all the quantiles and OLS. The variable ICDS\_dummy is positive and significant only at 25<sup>th</sup> and 50<sup>th</sup> quantile.

## Chapter 7

### Supplementary Nutrition Programmes: A Case Study of ICDS and MDM Programmes

This chapter discusses the utilisation of ICDS and MDM programme in Chaudhurirchar and Kumargaon revenue village. ICDS and MDM are the other important food based welfare programmes fully operational in the state since 2001 and 2005 respectively. Both the programmes were started in the study villages since the official date of announcement of the schemes in the state. The chapter is discussed in six sections.

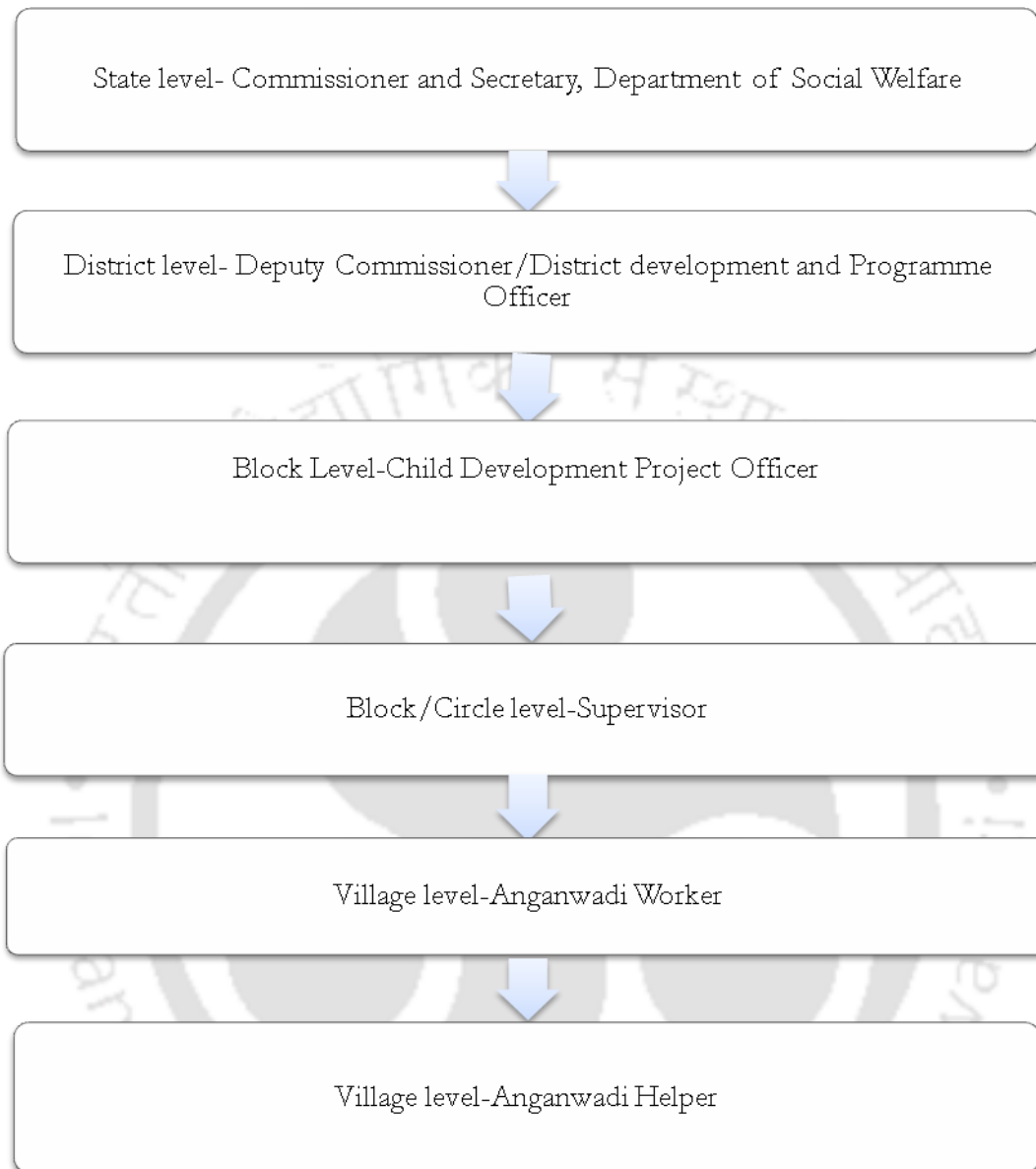
Section 7.1 describes organisational structure of ICDS. Section 7.2 describes the number of beneficiaries covered under ICDS in both the villages. Chaudhurirchar village had large number of beneficiaries than that of Kumargaon village. Section 7.3 contains information on Supplementary Nutrition Programme (SNP) provided through ICDS in the studied villages. This section shows the differences in having access to SNP in both the villages. Though both the villages fail to meet the required official target of SNP, Kumargaon village had comparatively better SNP provision than that of Chaudhurirchar village. Section 7.4 provides specific information on whether the Anganwadi Centres (AWCs) could fulfill the required need of the number of days of ICDS in the studied villages. This section also elaborates on the basic infrastructures available at the AWCs of the studied villages. Section 7.5 discusses health benefits derived from the AWCs. This section also explains the various duties and activities performed by the AWCs. Based on the case study of AWCs of the studied villages and PEO evaluation studies, this chapter indicates that despite very high demand for the services, the basic requirements of the AWCs are not yet fulfilled. Section 7.6 is about the operation of MDM in the studied villages and there are clear indications of very high demand for it.

## 7.1 ORGANISATIONAL STRUCTURE OF ICDS

The Ministry of Women and Child Development, GoI is the main agency for the budgetary allocation and implementation of ICDS-scheme. Prior to 2005-2006, the provision of providing supplementary nutrition was sole responsibility of the state government and the Central government had to bear 100 per cent administrative costs. Since 2005-06, the cost sharing ratio of SNP between Central and the state government changed to 50:50, whereas cost sharing ratio for other types of costs are 90:10. Since 2009-10, the cost sharing ratio of SNP between Central and the state government changed to 90:10 only for north eastern states keeping the other cost sharing ratio unchanged. Figure 7.1 shows the main agencies involved in the implementation of ICDS at the village level. At the state level the Department of Social Welfare and Department of Health work together to implement the ICDS-scheme. At the village level, AWCs are the main centre where the ICDS-scheme services are provided, which needs to be operated daily for four hours except Sundays and holidays. At the ground level Anganwadi Worker (AWW), Anganwadi Helper (AWH), Accredited Social Health Activist (ASHA) and Ancillary Nurse Midwife (ANM) work together to implement the ICDS scheme.

The AWWs are 'honorary female workers', belonging to the village community and accepted by the local community having minimum educational qualification of matriculation and aged between 18-35 years. AWW is selected by committee comprising members mainly of District Social Welfare Officer, Block Development Officer, Medical officer of Primary Health Centres, president of Gram Panchayat, district representative of the State Social Welfare Advisory Board. Monthly honorarium of AWW and AWH is Rs 3000 and Rs. 1500 respectively.

Figure 7.1 Organisational set up of functioning of ICDS in Assam



At the village level AWW function mainly with AWH along with public health workers like ASHA and ANM. ASHA is a female health activist selected from the local village community which connects public health system and community. The minimum qualification of ASHA worker is matriculation and should be in age group between 25-45 years. ASHA workers are selected through consensus of village self help groups, Anganwadi institution and Block Nodal Officer, the village Health Committee and Gram Sabha. There

is no fixed remuneration of ASHA worker, rather they get performance-based incentive. Among various joint activities, major activity is that AWW works with ASHA workers for identification of beneficiaries and for the implementation of immunisation and referral services.

#### *7.1.1 What does the ICDS aim at?*

*Child and women beneficiaries:* Before November 2001, the target groups of beneficiaries were the children and women belonging to the BPL households, but after the introduction of universal ICDS implies that every hamlet should have a functional AWC and all children below the age of 6 years and eligible women beneficiaries should be covered under the scheme. The norm for coverage of beneficiaries under each AWC in a non-tribal area is 40 for 0-3 year's age group and 3-6 years of age group, and 20 in case of pregnant and lactating beneficiaries group. For AWC of tribal areas, 42 number of beneficiaries for the above two mentioned group of children beneficiaries and 25 number of pregnant and lactating mother beneficiaries.

*Supplementary Nutrition Programme:* The main objective of supplementary feeding is to take preventive measure to reduce vitamin A deficiency and reduce anemia among the beneficiaries. This is an attempt to reduce the gap between recommended dietary allowance and average dietary intake among the beneficiary group. The food includes cooked meal i.e., combination of cereal, pulses, seasonal vegetables, oil and sugar including ready to eat meal containing some basic nutrient composition. Growth monitoring is done through monthly weighing of children below age 3 and children from 3 to 6 years are weighted in every 3 months; a regular weight to age chart also needs to be maintained by the AWW. This helps in calculating nutritional level of the children and to identify malnourished children. For mild level of malnutrition, mothers are advised about the special diet plan and care required

for the child and for severely malnourished children special SNP should be provided and also should be referred to the PHCs and SHCs as per requirement.

*Pre School Education:* Pre-School Education (PSE) includes child centered play, learning includes storytelling, counting numbers, painting, drawing, matching colour, writing alphabets, recognize pictures, identify objects with name with simple word etc. The PSE kits include picture books having pictures of animal, fruit, vegetable, colours, numbers, alphabets, building blocks, simple puzzle, toys etc.

*Health and referral services:* Immunisation to the children of 0-6 years includes six types of vaccines i.e. Poliomyelitis, Diphtheria, Pertussis, Tetanus, Tuberculosis and Measles. These diseases are most common causes of child mortality, disability, morbidity and diseases induced malnutrition. Pregnant women are immunized with Tetanus vaccine as prevention against maternal and neonatal mortality. The three services other than SNP i.e. immunisation, health check up and referral services are supplied through basic public health infrastructures such as PHC's, CHC's and Health Sub-Centre. The role and responsibility of the AWW is to ensure full coverage of immunisation of the beneficiaries of the respected AWCs, to fix the date of vaccination, keeps the record of vaccination, to maintain follow-ups and ensure full coverage through home visit. Also, IFA (iron, folic acid and vitamin A) supplements are provided to the beneficiaries under immunisation programme. Regular health check-up of the AWC beneficiaries is facilitated by AWW so that beneficiaries' gets diagnosed minor ailment and simple medicines are provided by Lady Health Visitor (LHV) and ANM of the PHC's and HSCs. Referral services includes the immediate reporting of sick and severely malnourished children to the PHCs and HSCs and the centre has the duty to prioritize the patient referred by AWW. It also includes the early detection of disability among the children. The AWW are also directed to provide NHE to the beneficiaries.

7.2 BENEFICIARIES UNDER ICDS IN CHAUDHURIRCHAR AND KUMARGAON VILLAGE

ICDS beneficiaries in Chaudhurirchar and Kumargaon village: There is 100 per cent coverage in both the villages after the universal ICDS. Table 7.1 shows the total beneficiaries in AWC of Chaudhurirchar and Kumargaon revenue village. It is clear that total numbers of beneficiaries are far larger in Chaudhurirchar village than that of Kumargaon village.

Table 7.1 ICDS beneficiaries in the studied villages

Age	Chaudhurirchar			Kumargaon		
	Boys	Girls	Total	Boys	Girls	Total
0-6month	4	2	6	2	2	4
6 month 3year	32	38	70	14	8	22
3 years - 6 years	24	34	58	10	6	16
Total	60	74	134	26	16	42
Pregnant women	13			7		
Lactating mother	10			4		

Source: Survey data, 2015

Prevalence of malnourishment and anemia among children below 0-6 years: As per the record of the AWW of both the villages, there are very few cases of severely malnourished or stunted children in the studied villages. In Chaudhurirchar village there are two severely malnourished girl children whereas in Kumargaon village there is no presence of severely malnourished or stunted children. However, presence of anemia is a major problem among the children in both the villages.

Prevalence of anemia among pregnant and lactating women: Prevalence of anemia among pregnant and lactating women is very common in both the studied villages. All pregnant women were anemic as per the record of the AWWs. Though this group of women beneficiaries are provided regular IFA tablets through the PHCs but anemia cannot be prevented fully. The reason behind anemia among children is intergenerational whereas the main factors behind anemia among women beneficiaries are poor diet, irregular intake of IFA tablets, lack of awareness regarding health complications due to anemia etc.

### 7.3 SNP PROVIDED THROUGH AWCs OF CHAUDHURICLAR AND KUMARGAON VILLAGE

The major services provided through the AWCs of the studied villages are: supplementary nutrition (SNP), pre-school education (PSE) and nutritional and health education (NHE) whereas other three services that are immunisation, health check up and referral services are delivered through primary health infrastructure of the villages. The AWW makes a co-ordination with the other health workers for the implementation of other three services. All types of services are being provided to other children and women beneficiaries and no services are provided to the adolescent girls during the time of survey as fund allotted to the adolescent girl beneficiaries had been stopped since 2008. Types of SNP provided to the beneficiaries of both the villages are cooked meal, dry ration also known as take home rations and fortified mix food. The following table 7.2 shows the official rate of SNP to be provided to the beneficiaries through the AWCs.

Table 7.2 Official calorie norm to be provided to the beneficiaries since April, 2009

<i>Beneficiaries</i>	<i>Cash allowance</i>	<i>Calorie norm to be provided</i>
Children under 6 years (excluding severely malnourished)	Rs. 6	500 calorie and 12-15grms protein per day
Children under 6 years (including severely malnourished)	Rs. 8	800 calorie and 20-25grms protein per day
Pregnant women and lactating women	Rs. 7	600 calories and 18-20gms of protein per day

*Source:* Government of India, 2010

As per the official norm, the children below 0 to 6 years is again classified into 3 groups i.e. 0 to 6 months, 6 months to 3 years and above 3 years to 6 years and nutritional food are accordingly provided to each group. For the first two groups, take home ration is provided along with fortified mix food and the last group receives cooked meal in the pre- school along with fortified mix food. Also, except the pre-school going children, other beneficiaries receive their food entitlement as take home rations. Table 7.3 and table 7.4 shows the SNP

provided to different beneficiaries against the allotted amount of cash in Chaudhurirchar and Kumargaon village.

Table 7.3 *Cash and quantity of SNP provided to the beneficiaries in Chaudhurirchar village*

Beneficiaries	Amount of total cash allotted per child/ women per day	Quantity rice/ pulses (gm/ per day)		Fortified mix food
		Rice	Pulses	
0 to 6 months	Rs6	0	0	0
6 months to 3 years	Rs6	70	10	0.5kg
3 to 6years	Rs2*+Rs6	70	10	0.5kg
Pregnant and	Rs7	150	25	1kg

Source: Survey data, 2015

Note: Total cash includes food expenses including cereal, pulses, vegetable, egg and milk and cooking costs

\*Amount allotted for breakfast to pre-school going children, but fund allotted for breakfast is not regular. Usually biscuit, one fruit (banana/apple/seasonal fruit) and milk is provided when there is sufficient fund. But most of the time biscuit and milk is provided in breakfast.

Table 7.4 *Cash and quantity of SNP provided to the beneficiaries in Kumargaon village*

Beneficiary	Amount of total cash allotted per child/ women per day	Quantity rice/ pulses (gm/ per day)		Fortified mix food
		Rice	Pulses	
0 to 6 months	Rs6	0	0	0
6 months to 3 years	Rs6	70	10	0.5kg
3 to 6years	Rs2*+Rs6	100	20	0.5kg
Pregnant women	Rs7	150	30	1kg
Lactating women	Rs7	150	25	1kg

Source: Survey data, 2015

Note: Total cash includes food expenses including cereal, pulses, vegetable, egg and milk and cooking costs

\*Amount allotted for breakfast to pre-school going children, but fund allotted for breakfast is not regular. Usually biscuit, one fruit (banana/apple/seasonal fruit) and milk is provided when there is sufficient fund. But most of the time biscuit and milk is provided in breakfast.

Table 7.5 shows the official diet plan followed in the AWCs of both the studied villages.

However, for better nutritional intake some more variety of nutritious recipes is prescribed by the nutritionist and state government guidelines, though in the schools of studied villages only few items were provided. Moreover in both the villages, the seasonal vegetables have not been regularly provided during the time of survey. It was also seen that in Kumargaon village more variety of THR were provided than that of Chaudhurirchar village. The THR of Kumargaon village includes rice, dry green peas and soya bean whereas THR of

Chaudhurirchar village includes only rice and masur dal. It was found in the survey that the demand for SNP and other services were very high in both the villages. The quality of food was also good as per the respondent households. However, the main problem is in supply side because of irregular and insufficient fund released by the government.

Table: 7.5 *Official diet plan for pre-school going children*

Monday	Khichdi+ seasonal vegetable
Tuesday	Kheer
Wednesday	Sujihalwa
Thursday	Khichdi +seasonal vegetable
Friday	Egg+Khichdi
Saturday	Kheer

*Source:* Government of India, 2010

### 7.3.1 *Amount of fortified mixed food is being provided in both the villages*

The quantity entitlement supplied to the beneficiary depends on the supply of stock of commodities which keeps on changing as per fund of the government. In Chaudhurirchar village, for children group of beneficiaries, 0.5kg of food per month per household was provided and 1kg of food per person per month was provided to the women beneficiaries. On the other hand in Kumargaon village, for children beneficiaries, 0.5kg of food per month per child for poorer households, and 0.5kg of food per month per households for the well to do households. The women beneficiaries were provided 1kg of food per person per month in this village. The reason behind this is the fulfillment of the demand from the stock of supply in Kumargaon village whereas in Chaudhurirchar village the demand is very high as the number of beneficiary is also very high.

PEO (2011) also indicates important information of very low public spending on SNP than actual requirement. Assam is in the second lowest position in the country for the price spent on per malnourished child for SNP. Assam spends only Rs 0.10 per day per child in SNP

for severely malnourished children. For different intervention carried out for children and women, it was found that Assam is among the most laggard states as compared to that of national average. For intervention relating to children, Assam performed poor for the following: indicators of average number of days of SNP received by the children, percentage of children received full immunisation and percentage of children consuming iron and folic acid tablets. Figures for intervention for pregnant women shows rather more dismal picture showing that Assam performs very poor for most of the indicators such as, percentage of pregnant women received SNP, average number of days SNP received, women aware about food entitlement, regular blood pressure check, women undergoing abdominal examination, attending NHE meeting, colostrums feeding, following advice about timely immunisation of child, advice on preparation of nutritious food for children etc. is very low.

#### *7.4 SPECIFIC INFORMATION OF AWCs IN CHAUDHURIRCHAR AND KUMARGAON VILLAGE*

Table 7.6 shows the some basic and specific information and services pertaining to the AWCs in the studied villages. The AWC of the Chaudhurirchar village was run from AWW's own residence whereas the AWC of Kumargaon village has its own building. Average number of days SNP received by the beneficiaries of Chaudhurirchar village was 13 days whereas average number of days SNP received by the beneficiaries of Kumargaon village was 20 days.

Table 7.6 Basic information of ICDS in the studied villages

	<i>Chaudhurirchar</i>	<i>Kumargaon</i>
Name of the AWC*	No. 2 Chaudhurirchar	Vitorkokilakumargaon
Own building/rent/AWW home	AWW home	Own building
Average number of days SNP received in a month	13days	20 days
Pre-school running time	10am to 1 pm	10am to 1pm
Average number of days AWC opens	15days	22 days
Percentage of children's mothers' awareness about food entitlement	0	20

*Source:* Survey data, 2015

\*The information on name, location detail of AWCs and profile of AWWs and AWHs are verified in GoI <http://icds-wcd.nic.in/icds/icdsawc.aspx>; however, the profile of beneficiaries is not updated till October 22 2017.

It was also seen that average number of operation of AWC in Chaudhurirchar village was 15days in a month whereas average number of operation of AWC in Kumargaon village was 22days. Usually, the AWC is functional for an average number of 5 days in a week when there is regular and sufficient fund and no other holidays. The AWC of both the villages have failed to meet the official norm of providing SNP for 25days in a month and 300days in a year due to supply constraint.

Attendance in the pre-school mainly depends on the food provided through the AWCs as the food attracts the children to attend the school. As per the respondent parents, the provision of SNP has multiple benefits as it leads to psychological development of the child because children develops more if they do the activities in group. In Chaudhurirchar village, there were no pre-school activities as there was no sufficient infrastructure during the time of survey. In such cases, the food has been distributed as dry ration. In Kumargaon village number of days of operation of AWC was much higher because of regular supply of funds. In both the villages, very less people were aware about the official entitlement of the SNP. In Chaudhurirchar village, none of the adult beneficiaries were aware of the quantity of food

entitlement whereas in Kumargaon village 20 per cent of adult beneficiaries were aware of the entitlement.

The PEO (2011) evaluation of ICDS shows that Assam was a low performer state in terms of distribution of SNP as compared to other states of the country. Assam is also among those few states of India which fails to achieve the official target of providing SNP for 25 days of a month. The study shows that supply side constraint is a major problem in Assam. Percentage of children not receiving food due to supply side constraints was very high in the state. Similarly, the percentage of pregnant women and lactating mother not receiving food due to supply side constraints was highest in Assam (87.6%) among other states of the country and the percentage of adolescent girls not receiving food due to supply side was about 50 per cent in the state. The demand side figure for these two indicators were about 5 per cent and 7.4 per cent respectively.

#### *7.4.1 Basic Infrastructure at AWCs of in the study villages*

Table 7.7 shows the basic infrastructure at the AWCs in both the villages. The AWC of Chaudhurirchar village is in dilapidated condition, after several applications to the authorities the centre was not repaired. The AWW is running the centre through her home. Therefore, the operations of pre-school activities are severely affected. AWC of the Kumargaon village is in good condition with the required teaching learning equipments and pre-school activities are regularly conducted in this centre. However, any kind of renewal work takes a long time to get approval from the authority. There is no adequate space for playing and sitting in the AWC of Chaudhurirchar village, whereas in Kumargaon village adequate space was available for these basic purposes. Lack of access to safe drinking water and lack of access to power supply is the major problem of the AWCs of both the villages. Other basic infrastructures such as, weighing machine, sitting mat, toys and other play

materials are not available in the AWCs of Chaudhurirchar village whereas most of these infrastructures are available in Kumargaon village.

Table 7.7 Provision of essential infrastructure in the AWCs

Infrastructure at AWCs	Chaudhurirchar	Kumargaon
School building	No	Yes
Adequate space of cooking	No	No
Adequate space of storage	No	No
Adequate Space for playing/sitting	No	Yes
Weighing machine	No	Yes
Sitting mat	No	Yes
Poster, play chart	Yes	Yes
Toys and other play materials	No	Yes
Access to safe drinking water source	No	No
Electricity	No	No

Source: Survey data, 2015

AWC of Kumargaon village maintains cleanliness and hygiene. As per the beneficiaries, the AWC of both the villages teaches lessons on maintenance of personal hygiene like washing hand with soap after toilet, washing hand with soap before and after having food, taking bath regularly etc in both home and schools.

The PEO (2011) found that 56 per cent of the AWCs of Assam do not have proper sanitation facility. The state is in lowest position in the country for the indicator of access to safe drinking water by the AWCs. 75 per cent AWCs has drinking water source of hand pump whereas AWCs of other states of the country has pipe water. Less than 30 per cent of the AWCs have access to adequate space for cooking and remaining 70 per cent AWCs do not have access to adequate space for cooking. Very few AWCs of the state have weighing scales for adults, cooking utensils, and almirahs, toys, poster and PSE kit. The percentage of AWC providing referral services and Kishori Shakti Yojana was much lower in Assam as compared to other states. About 61 per cent toilets of the AWCs are unclean and

unhygienic and only 11.4 per cent toilets are very clean. Figures for cleanliness of cooking area shows that the 67.3 per cent AWCs have totally unclean and unhygienic cooking area, 26.8 per cent has satisfactory level of cleanliness and only 6 per cent AWCs has very clean cooking area.

*7.5 HEALTH BENEFITS DERIVED THROUGH AWW AND AWCs IN  
CHAUDHURIRCHAR AND KUMARGAON VILAGE*

Table 7.8 shows the different health benefits received by the beneficiary households at the AWCs of both the villages. There is 100 per cent immunisation, 100 per cent children were weighted at birth. Those households who are unaware of immunisation and health services get the benefits through ASHA and AWWs monthly home visit. Regular weighing of children is 100 per cent in Kumargaon village which was found to be 80 per cent in Chaudhurirchar village. Medicines are available at the AWC, but beneficiaries mostly prefer to go to PHCs for medicine. Most common medicines available at the AWCs are vitamin A syrup twice supplied in one year, vermox tablet twice in a year and paracetamol tablet and syrup as and when required by the beneficiaries free of cost. Also the households expressed their satisfaction over access to basic medicine from the AWCs.

*Table 7.8 Different health benefits derived at the AWC in the studied villages*

<i>Health benefits</i>	<i>Chaudhurirchar</i>	<i>Kumargaon</i>
Percentage of children received full immunisation	100	100
Percentage of children weighted at birth	100	100
Percentage of children weighted regularly	80 per cent	100
Percentage of household reported of receiving vermox tablets from AWC	90	100
Amount of medicine supplement received	Vitamin A syrup, vermox tablets, paracetamol (once in a year)	Vitamin A syrup, vermox tablets, paracetamol (once in a year)

*Source:* Survey data, 2015

### 7.5.1 The duties and responsibilities of AWW in the studied villages

The duties and responsibilities of the AWWs are explained in the table 7.9, which indicates multiple tasks of AWWs. In both the studied villages, the AWW works around 8 hours for 6 days in a week along with regular home visit of 3 to 4 days in a week. An average of 4 hours has been invested in feeding and PSE i.e. from 9am to 1pm in both the villages. In Kumargaon village, the AWH cooks food and AWW distributes and monitors the feeding process whereas in Chaudhurirchar village, AWW cooks food and distributes it among children with the help of AWH. The feeding process takes about half an hour to 45 minutes in both the villages. The remaining time is allotted for accounts and record maintenance. The activities performed by the AWWs in both the villages are to teach the children, to cook food and to audit the budget, along with purchase of commodities.

Table 7.9 Official duties and responsibilities of the AWWs

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To open an account in the nearest bank in consultation with the AWC MC
To ensure prompt deposit of the fund received
To maintain all the records in the prescribed proforma correctly
To submit all the reports in time
To convene the AWC MC meeting regularly
To connect the AWC MC and community to make suitable arrangement for cooking meal
To ensure that there is 100 per cent coverage of the beneficiary
To make an arrangement of safe storage of food
To decide the time of meal distribution
To organise group of people for cooking and distribution of food
To mobilise community assistance for arranging food items
To spread awareness about breastfeeding, complementary feeding and better child care practices

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Source: Government of India, 2010

One of the main duties of the AWW is to regularly update the beneficiary list in the prescribed register. The AWW needs to maintain two types of registers i.e. 'delivery register' and 'service register'. In delivery register, birth records needs to be updated for the smooth identification of the beneficiaries and should also identify the cases of undernourishment, early disability and growth monitoring. The 'service register' consists of information on fund allocation and delivery of food for different groups of beneficiaries. However, one major

flaw in this regard was noticed in the time of survey where none of the registered was updated properly with the most recent records. The register of ASHA worker in Chaudhurirchar village consists of records of 2012-13 and in Kumargaon village it contains records of 2014. Similarly the AWW of both the villages have not updated any register.

The AWWs are paid a remuneration of Rs 3000 per month. In Chaudhurirchar village the AWW reported of not having salary at a regular basis. The AWW of both the villages are as per the official norm of 12 passed and the AWHs are matriculate in both the villages. The households reported of using ICDS handbook for all kinds of services as and when necessary in Kumargaon village whereas the households of Chaudhurirchar village reported rare use of any handbook for any kind of services.

*Role played by village community:* In both the villages, the village community plays a major role in functioning of the AWCs. In Chaudhurirchar village, village community plays a significant role in mobilising information to the beneficiaries, supplying drinking water, repairing the AWC. In Kumargaon village, transportation of food, mobilising information to the beneficiaries, selection of location for AWCs, providing land, supply of drinking water has been done by the village community.

#### 7.6 UTILISATION OF MDM IN THE STUDIED VILLAGES

The national Programme of Nutritional Support to Primary Education or Mid Day Meal (MDM) was improved and modified thrice since its introduction in 1995 and extended to all blocks of the country by 1997-98. At the initial phase, some of the states started distribution of dry rations at the rate of 3kg per month per child with 80 per cent attendance in school. Introduction of the cooked meal was started in government assisted schools since April 2002, though no specific mention was made regarding calorie norm per child but the

programme was extended to all Education Guarantee Scheme (EGS) and Alternative and Innovative Education (AIE) centres and in Maqtabas and Madrassas. In 2004 the calories norm was fixed as per 300kcal and 8-12 grams of protein per child per school day. This norm was revised in September 2006 to 450calories and 12 grams of protein per child per school day at primary school level along with adequate micronutrients like iron, folic acid and vitamin A etc. The following table shows the current food entitlement to be provided to the children.

Table 7.10 *Quantity (in grams) of food needs to be supplied to the MDM beneficiaries(per children per day)*

	Primary	Upper Primary
Foodgrain	100	150
Pulses	20	30
Vegetable/ leafy vegetables	50	75
Oil and fat	5	7.5

Source: Government of India, 2010

Table 7.11 *Weekly menu suggested in CMDM scheme*

Weekdays	Food items to be distributed
Monday	Rice, Dal, Leafy vegetable
Tuesday	Khichdi/Soya, leafy vegetable
Wednesday	Rice, egg curry/local option/leafy vegetable
Thursday	Rice, dal, leafy vegetable
Friday	Rice, dal, leafy vegetable
Saturday	Khichdi/pulao/ local option, leafy vegetable

Source: Government of India, 2010

The subsidies by the Central government include free supply of foodgrain i.e. 100 gram per child per school day and transportation subsidy of Rs50 per quintal till 2002. In 2004, the transportation subsidy was increased to Rs100 per quintal for North Eastern states and Rs75 per quintal for other states and a cooking cost of Rs1 per child per school day. In October 2006, cooking costs were further revised to Rs1.80 per child for NER states and Rs 1.50 per child per school day for other states and Union Territories. The coverage was increased for

the upper primary level (class VI to VII) in some of the Educationally Backward Blocks (EBB) since 2007. The scheme was extended for children studying in National Child Labour Project Schools (NCLP) since 2009-2010. Since 2011, the cooking cost has been shared by the Central and State government. The cost sharing proportion is 75:25 for non-NER states and 90:10 for NER states. In 2015 for non-NER states the proportion became 60:40 and for NER and there Himalayan states of Himachal Pradesh, Jammu and Kashmir and Uttarakhand remained at 90:10 and for UT the Central government provided 100 per cent costs.

In Chaudhurirchar village, the menu mainly consists of rice, dal, khichdi and egg curry. Though leafy vegetable is in the official menu for 6 days in a week but it is usually provided only twice or thrice in a week. Soya chunks were not provided during the reference period of survey time. The parents reported that, CMDM has benefitted the child as the child used to have one time full meal in school. However, they also reported to include more nutritious leafy vegetables and other options that are in official menu. On the other hand in Kumargaon village, leafy vegetable were provided three to four times in a week, soya chunks once in a week and also various kinds of local options including tomato-gur chutney and egg curry twice in a week.

*Nutritional support provided to the beneficiaries:* 100gms of rice per child was provided at LP level and 150gms rice are provided at UP level. The cash allowance of Rs4.14 per child has been provided by the government to purchase other food items such as pulses, vegetables, milk, egg and fuel cost. Though as per official record rice should be provided through GPSS agents but in both the villages rice is purchased by the school management authority by themselves.

*Share of rice consumed from CMDM:* As the parents reported of having full meal by the children, it can be estimated that the average monthly consumption of rice per child is 2.10kg at LP level and 3.15kg at UP level in both the villages. Similarly monthly consumption of pulses per child is 300gms to 350gms at LP level and UP level respectively in both the villages.

*Availability of kitchen sheds and other utensils and other infrastructure:* Temporary kitchen sheds are there in both the villages. One time fund of Rs. 7000 to buy utensils is provided by the government in the primary schools of both the villages. The manpower requirement is fixed at 1 cook for 25 students, 2 cooks for 26 to 100 students and the monthly honorarium for the cook cum helper has been fixed at Rs. 1000 per month. This norm was fulfilled in the schools of both the villages.

*Maintenance of hygiene in kitchen:* Cleanliness and hygiene was not properly maintained in both the villages. However, it was found that the kitchen shed of Kumargaon village was comparatively cleaner than that of Chaudhurirchar village.

#### *7.6. 1 NFSA 2013 recommendation for ICDS and MDM scheme*

The NFSA 2013 also recommends ensuring nutritional support to pregnant and lactating women and children in the age group between 6 months to 6 years through AWCs by providing free meal. It also ensures maternity benefit of Rs. 6000 as per the Central government's prescribed installments. This provision has not yet started in the state though GoA has its own maternity benefit scheme named as 'Mamoni' with maternity benefit of Rs 1000 per beneficiary in two installments. On the other hand the AWW and ASHA workers are unaware about the inclusion of ICDS under NFSA 2013. In case of children between age group of 6-14 years, one free mid day meal is supposed to be provided through school meal programme in local aided or provincialised and government aided schools. Also every school and AWC must have proper infrastructure for cooking meal, drinking water and

proper sanitation. However, AWCs of both the villages still do not have access to such basic facilities.

### 7.7 CONCLUSION

The services provided through ICDS are playing a major role in providing food and nutritional support in both the villages. There is full utilisation of SNP and demand for food is very high in both the villages. The main problem faced by AWC of both the villages is shortage of fund supply and irregular supply of fund. However, there is some difference in having the facilities in both the villages. It is also clear that though AWC of both the villages is facing various constraints, but the AWC of Kumargaon village is performing well as compared to AWC of Chaudhurirchar village. However, the AWCs of both the villages faces problems like irregular fund to purchase food, lack of sufficient food and lack of some more nutritious food. On the other hand, the AWCs of both the village face multiple problems which hamper in its proper functioning. There is no availability of basic infrastructures like proper house building to run the centre in Chaudhurirchar, lack of basic infrastructure like toilet facility, safe drinking water facility, electricity supply, lack of space for cooking and storing food etc. Therefore, the supply of fund should be regular and it should also be increased so that the beneficiaries can have access to more nutritional support.

## Chapter 8

### **In Conclusion: Rural Households of Assam Require Continuous Food Based Interventions**

#### *8.1. PUBLIC SUPPORT IN FOOD CONSUMPTION REQUIRED BECAUSE THERE IS AN ENTITLEMENT FAILURE*

The main theoretical underpinning of the thesis is Sen's entitlement approach and capability approach which has been widely in use in explaining problem of food security in developing countries since 1980's. Empirical facts emerging from the Indian and African famines led Sen to advocate that hunger and malnutrition can be traced to failures in acquirement of food due to entitlement failures (Dreze and Sen, 1989; Dreze and Sen, 1990). Another strain of thought that emerges from Sen's 1980s literature is the 'capabilities perspective' to assessing the 'well-being' of an individual (see Sen, 1981; 1985; 1992). He defines capabilities as 'a set of vectors of functionings, reflecting the person's freedom to lead one type of life or another' where 'functionings' refer to a set of 'beings and doings' such as 'being adequately nourished', 'being in good health', and 'avoiding escapable morbidity and premature mortality' (Sen, 1992). Looked at in this light, considering that people's functioning differs based on their entitlement set and capabilities, the benefits of economic growth are also reaped by different sections of the population differently.

In this context Sen argued that some long term policies are needed to enhance, secure and guarantee entitlements rather than just increasing food output at the national level (Sen, 1981). In support, Sen strongly advocates policy instruments of public intervention, such as free and subsidized food distribution, free school meals for children, and widespread health intervention (*ibid*).

In the above backdrop this thesis studies the three major components of National Food Security Act in India – targeted public distribution system (TPDS), Integrated Child

Development Services (ICDS) and mid-day meal (MDM) programme. Assam was one of the first Indian states to have implemented the NFSA in December 2015.

The 2000s has seen rise in head count ratio of poverty of rural Assam. This has also been the period of food price volatility. Various food security assessments carried out at the national level has shown that Assam's vulnerability to weather conditions and other forms of conflicts makes it an easy prey of food deficits. This thesis therefore argues that there is lack of entitlement in the form of reduction in capability set of individuals and households in Assam, and therefore public food support is a necessity (see sections 1.1 and 1.3).

### *8.2 MOST DISTRICTS OF ASSAM ARE VULNERABLE TO FOOD INSECURE CONDITIONS*

District level assessment of food insecurity based on the indicators of food availability, food accessibility and food absorption shows that none of the districts of Assam are completely food secure. Construction of indices was avoided in the district level analysis as there are limitations of data availability. The dimensions and indicators were adapted from the State level atlases on food security constructed by the MSSRF and IHD following the CFSVA framework of WFP. Altogether six indicators have been used for ranking the districts. For each individual indicator districts are ranked in descending order (district receiving rank 1 is low performer and vice versa) and the position of the districts as per the median rank.

Since the objective of this chapter was to come up with an overall assessment based on district ranks and select districts where further probing on food based welfare programmes could be carried out, instead of constructing indices for a final ranking a method of cumulative ranks was followed by applying BORDA scoring method. The cumulative ranks showed that Dhubri district ranked the lowest based on all the dimensions of food security. Jorhat district was ranked the best. Further, if we look at the individual ranks, Dhubri was

ranked lowest in most of the food security indicators. Jorhat, though not the best performer in all the indicators, was placed relatively high (see sections 2.3 and 2.4).

In order to study the role of food based welfare programme at the household level, two revenue villages i.e. Chaudhurirchar from Dhubri district and Kumargaon from Jorhat district was elected. Although, both the village were severely affected by flood and erosion, but Kumargaon was comparatively better off in terms of socio-economic indicators as compared to Chaudhurirchar village (sections 3.3 and 3.4 discuss the profiles of both revenue villages).

### *8.3 ASSAM PRESENTS A UNIQUE CASE OF GEOGRAPHICAL TARGETING ALONG WITH NARROW TARTETING OF POPULATION BASED ON INCOME CRITERION*

Public distribution of food falls in the Concurrent List as far as division of responsibilities between the Union and States is concerned. This also means that while Central government bears the major burden on subsidy for public distribution of food, States may or may not provide additional subsidy. Studies show that various States in southern India (Andhra Pradesh, Tamil Nadu, Kerala, and Karnataka) have a large state subsidy component. In the recent years, there seems to be a revival of PDS in India with states such as Odisha, Madhya Pradesh, Chhattisgarh and West Bengal providing large State subsidy to their PDS consumers (see section 4.5). However since food is a Concurrent subject, State specific policies also persist. The State subsidy component can be identified from the differences in state and central issue prices of PDS commodities in the concerned states.

A comparison of state issue prices among the major Indian states shows that Assam instead of providing a uniform state issue price for different categories of districts has various different SIPs based on geographical distance slabs. To illustrate while there are separate state issue prices for the plains, riverine and hills districts in the State of Assam, within each of these geographical locations also SIPs differ based upon the location of the fair price

shops. This means that the difference due to transportation costs is completely transferred to the end consumers. Therefore there are multiple state issue prices not just across broad geographical categorisations (such as plains, hills and riverine areas) but also within each of these categories, thus presenting an extreme complex scenario of price and quantity entitlements (section 4.6).

#### *8.4 HIGH ERRORS OF EXCLUSION FROM THE PDS PROGRAMME*

In Chaudhurirchar village, 16 per cent households possessed AAY cards, 34 per cent possessed BPL cards and remaining households possessed other types of cards or no cards at all. On the other hand in Kumargaon village, 33 per cent households possessed AAY cards, 20 per cent households possessed BPL cards and remaining households possessed either other types of cards or no cards at all. The estimates on targeting errors shows that there is very high level of 'exclusion error' (type I error) in the studied villages based on the two basic economic parameter of operational size of holding and principal occupation of the households. In Chaudhurirchar village, Type I error is 40 per cent and Type II error is 2 per cent for landholding criteria. Similarly it is type I and type II error is 35 per cent and 6 per cent respectively for occupation criteria. In Kumargaon village, Type I error is 37 per cent and Type II error is 6 per cent for landholding criteria whereas it is 35 per cent and 8 per cent respectively for the occupation criteria (sections 5.2 and 5.3).

The post NFSA estimates shows that in Chaudhurirchar village, there was no inclusion of 'no cardholder' households and earlier BPL, APL and MMASY households were identified as PHs. Thus in Chaudhurirchar village, total number of AAY households is 20 and total numbers of PHs are 109, and households which did not possess any ration cards (18) remained excluded even after the implementation of NFSA 2013. On the other hand in Kumargaon village, apart from the AAY households, all the earlier BPL, APL and MMASY

households were included as PHs and above all, other households which did not possessed any ration cards before NFSA were also included as PHs. Thus total number of AAY households in Kumargaon village was 37 and total number of PHs was 74. Thus all households are covered within the TPDS frame in Kumargaon village after the introduction of NFSA 2013. The 61<sup>st</sup> round data of NSSO shows that there is high rate of exclusion in the state. The village data also shows the similar outcome as per NSSO data, where exclusion error was very high. These excluded households are mostly APL and MMASY and household without any ration cards (section 5.3.1).

#### *8.5 CEREALS CONSUMPTION DEVIATION FROM NORM LOW WHEN HOUSEHOLDS HAVE ACCESS TO PDS RICE AND HAVE OTHER ENTITLEMENTS SUCH AS LAND*

The NSSO 61<sup>st</sup> and 66<sup>th</sup> round estimates shows that at all India level, the households reported consumption from PDS is very low in Assam. Moreover, the NSSO 66<sup>th</sup> round estimates shows that the cost of PDS rice is relatively higher in Assam as compared to some other rice eating states, despite of that the lower MPCE class size households consume more from the PDS(16kg) than that of upper MPCE class size households(1kg).

From the village data, it is clear that very few households can entirely rely on PDS rice for their monthly consumption because PDS rice cannot give them month long food support. Therefore the households have to rely either on open market or home grown stock of rice. However, in both the village majority of the households are marginal landholding households and their home grown stock lasts only for 2 to 3 months in a year. Therefore households rely on combination of all sources for their monthly rice consumption. In both the villages TPDS rice is mainly available to AAY and BPL households.

The TPDS system of the both the village shows that neither the beneficiary households received their PDS entitlement fully and nor the FPSs strictly followed the SIP fixed for

riverine areas of the state since the starting of the programme in both the villages. This happened because of the presence of multiple SIPs and keeping SIP open without any mandatory regulation from the government to charge price exact as SIP. Therefore, in both the villages the households bear a large welfare cost for the consumption of TPDS rice. The welfare cost is more in Chaudhurirchar village than that of Kumargaon village. This welfare cost was borne by the households even after the implementation of NFSA in December 2015 to July, 2017. There is a clear indication towards the existence of corruption from the confession of FPS dealer about the sale of PDS rice at the open market, information dissimilarity of the FPS dealer and APL beneficiary households, wrong entry in the register of the FPSs dealer, and statement made by FPS dealer regarding NFSA 2013 that with the implementation of the act the GPSS and FPSs will lose out the APL profit are the cases of presence of corruption in the distributive mechanism.

The pooled quantile and OLS regression explaining the factors affecting the foodgrain deviation (Fdev) shows that BPL households have positive and significant contribution in 50<sup>th</sup> and 75<sup>th</sup> quantile class of Fdev. But it has no impact on lowest quantile, which means that BPL allocation is not sufficient for the most food insecure households. The RC\_4 dummy is negative and significant for OLS as well as for 25<sup>th</sup> and 50<sup>th</sup> quantile class of Fdev, which means that households which do not have any type of card are more food insecure. The other important explanatory variables are OH\_Land, FDI, MPCE, dummy for the ICDS and MDM. The variable OH\_Land is positive and significant for OLS and all the quantiles which implies that possession of land has positive and significant impact on household foodgrain security for all the households - across most food insecure class to the most food secure class. Similarly the MPCE variable also shows positive and significant effect on household's foodgrain security for both OLS and all the quantile class of FDev, implying that an increase in MPCE leads to increase in food security for all classes. The

ICDS\_dummy is positive and significant for OLS, but it shows no significant impact on any of the quantile class. This may be due to universal coverage of ICDS in both the villages. The MDM\_dummy shows negative and significant impact for OLS and 50<sup>th</sup> and 75<sup>th</sup> quantile of FDev. The variable Adult\_literate has negative and significant for OLS, but not significant for any of the quantiles.

In Chaudhurirchar village, only three variables are showing significant relationship with the Fdev, i.e. RC\_4, MPCE and MDM\_dummy. RC\_4 has negative and significant value which implies that the households which do not possessed any ration cards are relatively food insecure households than the reference group of households. The variable MPCE also has positive and significant impact on foodgrain security of the households. The variable MDM shows a negative and significant impact on the foodgrain security of the households. The impact of MDM however cannot be generalised in this case because only a fraction of population is considered.

In Kumargaon village, RC\_1 is positive and significant at 25<sup>th</sup> quantile of Fdev. This may be due to the reason that households of most food insecure class get the most benefits from TPDS through AAY cards. Another reason may be because of full entitlement of the AAY rice in Kumargaon village. Similarly, the RC\_2 variable shows that it is significant for OLS, 75<sup>th</sup> and 50<sup>th</sup> quantile. The RC\_4 dummy is negative and significant for OLS and 25<sup>th</sup> and 50<sup>th</sup> quantiles. This result again indicates that the households without any ration cards are most food insecure and they need major food intervention. The variable OH\_Land has positive and significant impact for all the quantiles but OLS. Similarly, the variable FDI shows negative and significant impact on FDev in OLS, 25<sup>th</sup> and 50<sup>th</sup> quantile which implies that households with low foodgrain security have to sacrifice cereals if they want to have other non-cereal food. The MPCE variable is positive and significant for all the quantiles

and OLS. The variable ICDS\_dummy is positive and significant only at 25<sup>th</sup> and 50<sup>th</sup> quantile.

#### *8.6 HIGH DEMAND OF SUPPLEMENTARY NUTRITION PROGRAMMES IN THE STUDY VILLAGES*

The services provided through ICDS- scheme SNP (both cooked meal and dry ration), Pre School Education and referral services i.e. mostly health related services in the study villages. There is full utilisation of SNP and demand for food is very high in both the villages. The main problem faced by AWC of both the villages is shortage of fund and irregularity in fund supply. The AWC of both the villages have failed to meet the official norm of providing SNP for 25days in a month and 300days in a year due to non availability of funds. Average number of days SNP received by the beneficiaries of Chaudhurirchar village was 13days whereas average number of days SNP received by the beneficiaries of Kumargaon village was 20days. Moreover in both the villages, the seasonal vegetables have not been regularly provided during the time of survey. However, there are some difference exists in having the facilities in both the villages.

The THR of Kumargaon village includes rice, green peas and soya bean whereas THR of Chaudhurirchar village includes only rice and masur dal. The quality of food was also good as per the respondent households. So far as fortified mixed food is concerned, in Chaudhurirchar village, for children group of beneficiaries, 0.5kg of food per month per household was provided and 1kg of food per person per month was provided to the women beneficiaries. On the other hand in Kumargaon village, for children beneficiaries, 0.5kg of food per month per child for poorer households and 0.5kg of food per month per households for well off households. The women beneficiaries were provided 1kg of food per person per month in this village. It is also clear that the AWC of Kumargaon village is performing well as compared to AWC of Chaudhurirchar village. The AWC of

Chaudhurirchar village does not have school building. The most basic infrastructural facilities like toilet, safe drinking water and electricity supply are not available in the AWC of both the villages.

The AWC of Chaudhurirchar village is in dilapidated condition and the AWW is running the centre through her home. Therefore, the operations of pre-school activities are severely affected. AWC of the Kumargaon village is in good condition with the required teaching learning equipments and pre-school activities are regularly conducted in this centre. Lack of access to safe drinking water and lack of access to power supply is the major problem of the AWCs of both the villages. Similarly MDM is has also very high demand and full utilisation by the beneficiaries in the study villages.

#### *8.7 THE WAY FORWARD*

The most striking finding from the field study was the large amount of leakages of PDS foodgrains at the FPS level. The incidence of leakages was comparatively higher in Chaudhrirchar village than in Kumargaon. None of the respondents in the former reported utilizing their legal entitlement. For example, an AAY household was entitled to 35 kgs of rice per month while the amount consumed was only 30 kg. Similarly a BPL household that was entitled to 33.33 kg per month could also utilize only 30 kg. Apart from curtailment of their legal entitlement of 35 kg, the SIP charged from BPL households was higher than the state specified SIP for riverine areas. Clearly the households in Chadhurirchar village did not receive their entitled subsidy. In Kumargaon the legal quantity entitlements were more or less available to the households. The price charged from the end consumer was however much higher than the SIP for plain areas. Exclusion error estimates based on landholdings and occupation categories were found to be very high in both villages. The second most important finding is based on the OLS and quantile regression on foodgrains deviation in the study villages. Pooled regression showed that households possessing operational land

holdings, with higher MPCE and those accessing TPDS through BPL card entitlements are facing less foodgrains consumption deviation from the norm. In other words they are relatively more food secure than rest of the households. The ICDS and MDM programmes in both villages were found to be fully utilized in both the study villages. Lack of basic infrastructure and irregularity of funds were major problem areas. Overall the dependence and demand for food based welfare programmes in the study villages are extremely high.

#### *Limitations of the study*

The study is based on cross section data and therefore gives the picture of functioning of food based welfare programmes in a single point of time. The allocation and off take data of TPDS could not be covered as the information derived from the interview of government officials of department of FCSCA indicates that allocation data allocation took place in different form such as normal, special, ad-hoc and special ad-hoc and additional allocation. The state Government of Assam has not maintained regular records of allocation data. For overall allocation, several adjustments took place among all these types of allocations throughout the year. Also, the different types of allocation data are not regularly updated at the public domain. The study also could not cover the nutritional impact of the food supplied through the food based welfare programmes.

#### *Policy suggestions*

The study was conducted in two flood and erosion affected villages of Assam. The proneness to natural disasters and the overall poor socio-economic conditions of the study villages provide a necessary justification for the implementation of food based welfare programmes in the study area. However, a number of critical issues emerge while studying functioning of targeted PDS and other food based welfare programmes in Assam in general, and in the study villages in particular.

One of the most disconcerting findings at the state level is the nature of geographical targeting carried out in Assam, with no uniform policy whatsoever with respect to the state issue price of rice. The large incidence and involvement of private dealers in distribution of PDS rice makes un-uniform pricing subject to leakages and corruption. While geographical targeting as policy prescription has been followed in different countries of the world, including Indian states, Assam's geographical targeting is complex and critical. This is so because while targeting based on plains, hills and riverine areas may be a policy imperative, price differences in different locations within the same geography (based on distance from FPS) makes it highly discriminatory as far as the end consumers are concerned. Effectively, PDS consumers in Assam bear a heavy price burden of accessing its subsidized food programme.

At the village level, welfare costs are unevenly distributed across the cardholder households due to multiple pricing and its associated consequences of information distortions. Rural households are not able to utilize their entitled quantity allotment even while their requirement of consumption from the PDS is extremely high. Leakages from the FPS level raise the social costs of under provision of subsidized rice to its rightful beneficiaries. Therefore introduction of National Food Security Act and its implementation is a welcome relief. However given the large scale irregularities in distribution due to the involvement of private dealers, administrative reforms at the Panchayat level is an absolute necessity. There needs to be a revival of the role of Gram Panchayat Samabaya Samitis in the distribution mechanism. The component of social auditing and citizen's engagement in the provision of foodgrains at the village level must be taken up urgently.

Table A1.1 *Global Food Security Initiatives, 1943 to 2001*

<i>Year</i>	<i>Food security initiative</i>	<i>Focus area</i>
1943	Hot Springs Conference on Food and Agriculture also called the United Nations Conference on Food and Agriculture held in Virginia, United States of America	President Franklin Roosevelt of the USA called on nations to increase agriculture supplies to meet the increasing food needs of the world's people. The Conference was held in the midst of the 2 <sup>nd</sup> World War and it also paved way towards formation of the Food and Agriculture Organization in 1945
1943	The United Nations Interim Commission on Food and Agriculture	Made necessary arrangements for FAO's formal establishment
1945	The Quebec Conference	The process of formation of the FAO was completed
1945	The Food and Agriculture Organization established	Established as a specialized agency of the United Nations to lead international efforts on dealing with world hunger and food crises
1946	UNICEF established	To provide food, clothing and health care to European children facing famine after the 2 <sup>nd</sup> World War
1948	Universal Declaration of Human Rights	Adopted by the United Nations General Assembly in direct response to the experiences of the 2 <sup>nd</sup> World War and called for expression of a rights of human beings
1963	World Food Programme established	The FAO and the UN General Assembly adopted parallel resolutions for establishing the WFP to cater to the most pressing and urgent food needs of the countries in the event of natural disasters and conflict situations
1966	International Covenant on Economic, Social and Cultural Rights	To work towards granting of economic, social, and cultural rights to individuals, including labour rights, right to health, right to education, and the right to an adequate standard of living
1967	First Food Aid Convention (FAC)	A legal instrument under the International Grains Agreement. Under the Food Aid Convention the donor countries pledge to provide annually specified amounts or values of food aid to developing countries in the form of grains and other eligible products
1974	World Food Conference: Universal Declaration on the Eradication of Hunger and Malnutrition	Convened by the UN General Assembly to develop ways and means to resolve the world food problem within the broader context of development and international economic cooperation.

	World Food Council established	Emerged out of the recommendations of the World Food Conference. Established by the UN General Assembly as a coordinating body for national ministries of agriculture to help reduce malnutrition and hunger.
	FAO committee on World Food Security established	Set up as an intergovernmental body to serve as a forum for review and follow up of food security policies.
1975	FAO Global Information and Early Warning System(GIEWS) established	To monitor the world food supply/demand situation, provide international community with timely information on crop prospects, global, regional and country specific food security situation.
	International Emergency Food reserve(IEFR)	Started under the World Food Programme as a voluntary facility to provide emergency relief from food stocks and budgeted funds kept in donor countries.
1976	Club du Sahel established as part of OECD	Works in association with OECD Development Assistance Committee and brings together the Sahelian countries suffering from drought conditions and addresses their food security concerns
1980	OAU Lagos Plan of Action	Called in Lagos, Nigeria to increase Africa's food self-sufficiency. The Plan brought to fore Africa's vulnerability to worldwide economic shocks, and for the first time blamed the structural adjustment programmes of the World Bank and IMF for the economic problems of Africa
1981	European Community Plan of Action to Combat Hunger in the World	Held in Brussels the Plan of Action made proposals for taking action against hunger in the world, mainly in the form of food aids
1983	Broadened concept of food security adopted by FAO	Ensuring that all people at all times have both physical and economic access to the basic food that they need
1984	Lome III convention gives central place to food security	
1985	USAID Famine early Warning System(FEWS) established	To build state of the art data management systems of identifying famines mostly in the African countries To expand production, increase stability of food supplies and ensuring access

	World Food security Compact of the FAO	to food by the poor
1988	World Bank Task Force report “The challenge of Hunger in Africa: a call to action and initiation of World Bank food security studies in Africa”	
	Convention on the Rights of the Child adopted by the General Assembly of the United Nations	
1989	Initiation of FAO food security planning in four African countries	
	Bellagio Declaration: Ending half the world’s hunger by the year 2000	
	WFC Cairo Declaration and Programme of Co-operative Action	
1990	Food Aid Charter for the countries of the Sahel World Summit for Children (UNICEF)	
1996	World Food Summit Plan of Action of the FAO (1996)	Food security, at the individual, household, national, regional and global levels [is achieved] when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life.
2000	UN Millennium Development Goal –	The first goal of the UN MDG is to eradicate extreme poverty and hunger
2001 –	The State of Food Insecurity in the World reports published jointly by the United Nations and Food and Agriculture Organization since 2001	

*Source:* Maxwell and Smith (1992); FAO (1996; 2009; 2012)

Table A1.2 Poverty ratios of Indian States based on Tendulkar Methodology, Rural and Urban (in percentage), 2004-05 and 2009-10

States	2004-05	2009-10	Difference
Andhra Pradesh	29.6	21.1	-
Arunachal Pradesh	31.4	25.9	-
<b>Assam</b>	<b>34.4</b>	<b>37.9</b>	<b>+</b>
Bihar	54.4	53.5	-
Chattisgarh	49.4	48.7	-
Gujarat	31.6	23	-
Haryana	24.1	20.1	-
Himachal Pradesh	22.9	9.5	-
Jammu and Kashmir	13.1	9.4	-
Jharkhand	45.3	39.1	-
Karnataka	33.3	23.6	-
Kerala	19.6	12	-
Madhya Pradesh	48.6	36.7	-
Mahrashtra	38.2	24.5	-
<b>Manipur</b>	<b>37.9</b>	<b>47.1</b>	<b>+</b>
<b>Meghalaya</b>	<b>16.1</b>	<b>17.1</b>	<b>+</b>
<b>Mizoram</b>	<b>15.4</b>	<b>21.1</b>	<b>+</b>
<b>Nagaland</b>	<b>8.8</b>	<b>20.9</b>	<b>+</b>
Odisha	57.2	37	-
Punjab	20.9	15.9	-
Rajasthan	34.4	24.8	-
Sikkim	30.9	13.1	-
Tamil Nadu	29.4	17.1	-
Tripura	40	17.4	-
Uttar Pradesh	40.9	37.7	-
Uttarakhand	32.7	18	-
West Bengal	34.2	26.7	-
All India	37.2	29.8	-

Source: Compiled from Government of India, 2011 and 2012

Table A. 1.3 *Poverty ratios of Indian States based on Tendulkar Methodology, Rural (in percentage), 2004-05 and 2009-10*

States	2004-05	2009-10	Difference
Andhra Pradesh	32.3	22.8	-
Arunachal Pradesh	33.6	26.2	-
<b>Assam</b>	<b>36.4</b>	<b>39.9</b>	<b>+</b>
Bihar	55.7	55.3	-
<b>Chattisgarh</b>	<b>55.1</b>	<b>56.1</b>	<b>+</b>
Gujarat	39.1	26.7	-
Haryana	24.8	18.6	-
Himachal Pradesh	25	9.1	-
Jammu and Kashmir	14.1	8.1	-
Jharkhand	51.6	41.6	-
Karnataka	37.5	26.1	-
Kerala	20.2	12	-
Madhya Pradesh	53.6	42	-
Maharashtra	47.9	29.5	-
<b>Manipur</b>	<b>39.3</b>	<b>47.4</b>	<b>+</b>
<b>Meghalaya</b>	<b>14</b>	<b>15.3</b>	<b>+</b>
<b>Mizoram</b>	<b>23</b>	<b>31.1</b>	<b>+</b>
<b>Nagaland</b>	<b>10</b>	<b>19.3</b>	<b>+</b>
Odisha	60.8	39.2	-
Punjab	22.1	14.6	-
Rajasthan	35.8	26.4	-
Sikkim	31.8	15.5	-
Tamil Nadu	37.5	21.2	-
Tripura	44.5	19.8	-
Uttar Pradesh	42.7	39.4	-
Uttarakhand	35.1	14.9	-
West Bengal	38.2	28.8	-
All India	42	33.8	-

Source: Compiled from Government of India, 2011 and 2012

Table A 2.1 *Indicators used in CFSVA-baseline in food security analysis all over the world*

Serial no	Indicators	Importance to food security analysis
1	Size of household	Size of the household is considered in calculating food rations in many countries
2	Age dependency ratio (aggregate level like country, State, region etc)	Regions with high age dependency rate are generally less food secure
3	Percentage of dependents (this can be used at household level)	Very high percentage of dependents (>70) in the household implies serious vulnerability
4	Crowding Index	Used as an element in the construction of a wealth index
5	Child headed household or elderly headed household	This type of household is usually more food insecure
6	Marital status of household head (reported in percentage)	Food insecurity is related to the marital status category, e.g. widows/ widowers or single mothers are more prone to food insecurity
7	Literacy rate (reported in percentage)	Literacy is positively related with food security
8	Physically challenged member of a household (used in percentage)	Disability augments people's exposure to food insecurity
9	Sex of household head (reported in percentage)	In many cases female headed households are found to be more food insecure
10	Age of household head (reported in mean age or percentage of household heads)	Same as mentioned in case of indicator 5)
11	Years of schooling ( reported in mean / median no of years of schooling, percentage of households where the years of education of household head is above a certain cut-off)	Household with lower level of education of the head can be more vulnerable to food insecurity
12	Level of schooling (reported in percentage)	Same as indicators 7, 11
13	Net Enrolment Rate	Same as indicators 7, 11
14	Gross Enrolment Rate	Same as indicators 7, 11
15	Housing construction material (reported in percentage)	Can be used as an element in constructing wealth index
16	House ownership (reported in percentage of households)	Same as for variable 15, but can be more useful in urban set up
17	Toilet/sanitation (reported as percentage of households using improved sanitation facilities)	It is a proxy measure of food utilisation, also used in the construction of wealth index
18	Improved drinking water sources (reported in percentage)	Unsafe drinking water is directly related to water-related diseases which later on found to be causes of malnutrition. It is also used in

		the construction of wealth index
19	Distance from water sources (reported in mean and median	
20	Sources of light , cooking fuel (percentage of households)	
21	Household's physical assets (mean/median index value of assets and percentage of households owning important productive assets)	Assets might help the household in future emergencies
22	Household shocks (percentage of households reporting specific shocks)	Shocks can increase vulnerability and decrease food security of the individual or household
23	Coping strategies (percentage of households reporting specific coping strategy)	
24	Copping Strategy Index (reported as mean value)	It is a proxy variable of food insecurity. Higher CSI score means higher level of food insecurity and lower score is a better one
25	Access to agriculture land (percentage of households with access to land)	The people will invest on land if they have ownership of land and so it is a key determinant of food security in rural communities
26	Amount of agricultural land (reported in terms of mean value)	It can be a key factor in terms of food availability in rural areas
27	Main crops cultivated (reported in percentage of households that cultivates the specific crop)	
28	Agricultural production (total crop production of the household, or per capita crop production of the household)	It is one of the pillar of food availability
29	Food stocks	It is like a safety measure for household food security
30	Ranked main and secondary livelihood activities	The ranked different livelihood activities helps in identifying which activities are important in certain natural and social context.
31	Contribution from different livelihood activities	
32	Livelihood groups	Household with different livelihood strategies have different food security status and are vulnerable to different types of shocks.
33	Household Expenditure indicators	It can be used as a wider proxy for wider purchasing power which is an important component of food access.
34	Access to credit, sources of credit	It helps in productive investment or generate asset accumulation
35	Stunting or low height for age (children>2 years)/low length for age(children<2 years)	It indicates chronically inadequate level of protein and energy intake, micronutrient deficiency and frequent infection over a long period of time.
36	Wasting or low weight for height	It is an indicator of current malnutrition due to inadequate food

		intake, disease, infections etc.
37	Underweight or low weight for age	It helps to assess the changes in magnitude of child malnutrition over a period of time.
38	Mid Upper Arm circumference	It is a useful tool to screen cases of acute malnutrition and it acts as good predictor of immediate risk of death due to macronutrient malnutrition.
39	BMI of reproductive-age women	It is used to measure Chronic Energy Deficiency (CED) which is a measure of underweight for non- pregnant adults. It is good proxy indicators of overall adult health.
40	Under Five Mortality Rate	This indicator helps in analyzing severity of crisis, identify needs and prioritize resources. This also indicates the overall performance of health facilities, education and nutritional standard of the household.
41	Disease prevalence (reported in mean or frequencies)	Directly linked to access to health and nutrition services.
42	Food Consumption Score (Frequency of the profile)	It is a key variable which helps in understanding the food consumption gap of different groups.
43	Dietary diversity (reported in terms of mean dietary diversity score)	It is positively related with the adequate food intake; therefore small value indicates poor diet.
44	Food Consumption Clusters	It is a key variable to assess the food consumption pattern of specific cluster of household.
45	Sources of food	It gives information about household's access to food
46	Number of meals per day taken by adults and children	This will help to identify household with extremely poor food condition.
47	Wealth Index	This index is always compared with FCS. It gives idea of relative wealth situation of household and also can be used as proxy of vulnerability or resilience.
<i>Source:</i> Compiled from guidelines of CFSVA-Baseline, WFP(2009)		

Table A4.1 District wise percentage of APL, BPL and AAY beneficiary households to total beneficiary households in Assam, 2011-2012

District	APL	BPL	AAY
Dhubri	66	22	12
Kokrajhar	64	23	13
Goalpara	68	21	11
Bongaigaon	73	17	10
Chirang	64	23	13
Barpeta	68	19	12
Baksa	67	21	12
Nalbari	59	25	16
Kamrup(M)	75	16	8
Kamrup(R)	66	22	12
Darrang	65	22	13
Udalguri	59	26	15
Sonitpur	59	27	12
Nagaon	68	21	11
Morigaon	70	19	12
KarbiAnglong	20	50	30
Lakhimpur	68	20	12
Dhemaji	48	31	21
Golaghat	23	45	32
Jorhat	73	16	11
Sivsagar	72	17	11
Dibrugarh	72	17	11
Tinsukia	70	18	13
N. C. Hills	57	29	14
Karimganj	67	22	11
Hailakandi	63.3	23	12
Cachar	63.8	24	13

Source: Government of Assam

Table A4.2 District wise number of MMASY cardholder in Assam

<i>District</i>	<i>Number</i>	<i>Name of District</i>	<i>Number</i>
Kamrup	98010	Barpeta	111214
Kamrup(M)	45750	Golaghat	69213
Dhemaji	30778	Sivasagar	94344
Tinsukia	87246	Hailakandi	41991
Chirang	31440	Cachar	116163
Goalpara	59468	Nalbari	54195
Nagaon	164451	Baksa	58200
Sonitpur	125505	Dhubri	107737
Dibrugarh	102337	Jorhat	88855
Dima Hasao	15000	Morigaon	58306
KarbiAnglong	60000	Kokrajhar	53944
Lakhimpur	55248	Bongaigaon	45685
Karimganj	79144	Total	1973425
Udalguri	59925		
Darrang	49276		

Source: Government of Assam, 2012

Table A4.3 Districtwise number of total cardholder households under NFSA, November 2017

District	AAY	APL	BPL	MMASY	Newly included		AAY+PHH
					households	Tot_PHH	
Baksa	21195	84212	29404	24956	27854	166426	187621
Barpeta	37715	102255	60030	79805	25920	268010	305725
Bongaigaon	16310	66283	25485	16530	11052	119350	135660
Cachar	37031	201489	67574	3840	11070	283973	321004
Chirang	13656	30011	23929	17434	4859	76233	89889
Darrang	17129	29779	23916	34991	29414	118100	135229
Dhemaji	17176	56194	27078	24754	10657	118683	135859
Dhubri	37845	144549	67025	94410	610	306594	344439
Dibrugarh	30718	84628	44511	64396	36032	229567	260285
Dima Hasao	5870	12070	13018	3420	4	28512	34382
Goalpara	19629	61571	37731	47858	12879	160039	179668
Golaghat	29372	77799	48829	48750	16090	191468	220840
Hailakandi	15006	46380	25684	40381	1658	114103	129109
Jorhat	30897	61879	46298	61223	30293	199693	230590
Kamrup(R)	41171	71376	72309	65776	43402	252863	294034
Kamrup (M)	7967	45601	17969	31288	59548	154406	162373
KarbiAnglong	13625	42425	61012	18327	8998	130762	144387
Karimganj	22148	122924	39888	15653	30956	209421	231569
Kokrajhar	22817	63851	35689	37942	17049	154531	177348
Lakhimpur	24552	52277	42324	57386	22072	174059	198611
Morigaon	20476	71189	38920	50170	5294	165573	186049
Nagaon	57878	181132	98956	73772	26339	380199	438077
Nalbari	22150	51474	29989	31883	13924	127270	149420
Sivasagar	31267	65551	54116	61412	24083	205162	236429
Sonitpur	40592	132927	81156	88992	40533	343608	384200
Tinsukia	31794	116785	38117	48032	21320	224254	256048
Udalguri	24085	46407	37219	42921	16160	142707	166792
Total	690071	2123018	1188176	1186302	548070	5045566	5735637

Source: Government of India, as available in [http://164.100.128.97/ASSAM\\_PDS/](http://164.100.128.97/ASSAM_PDS/)

Table A4.4 *District wise number of FPS in Assam, 2011-12*

<i>District</i>	<i>Total</i>	<i>Name of districts</i>	<i>Total</i>
Dhubri	719	Morigaon	1107
Kokrajhar	960	KarbiAnglong	794
Goalpara	845	Lakhimpur	1695
Bongaigaon	354	Dhemaji	1402
Chirang	448	Golaghat	1995
Barpeta	1988	Jorhat	1591
Bagsa	775	Sivsagar	2006
Nalbari	763	Dibrugarh	1691
Kamrup(M)	829	Tinsuki	1684
Kamrup®	1590	N. C. Hills	263
Darrang	975	Karimganj	1091
Udalguri	1161	Hailakandi	834
Sonitpur	1791	Cachar	1978
Nagaon	2889		

*Source:* GOA, 2011-12

Table A6.1 Formation of MPCE variable for the studied villages

<i>MPCE Food</i>	<i>MPCE Non food</i>
Total consumption and expenditure on food items by the households during last 30days	Total expenditure incurred on non food items by the households during last 365 days
Total food consumption and expenditure heads	Total non food expenditure heads
1.Cereals= Rice+Chira+Muri+Wheat+others	1.House repairing a construction of house
2.Pulses= Moong+ Masur+Urad+Arhar	2.Health expenditures
3.Vegetable(Chaudhurirchar)=Potato+yam+dantha+jute leaves+brinjal+ashgourd+pumpkin+bottlegourd+lady's finger+long beans	3.Education=fees including admission fee+tuition fee+ expenditure on books and stationary+others
Vegetables(Kumargaon)=Potato+pumpkin+bottle gourd+sim+cabbage+spinach+radish+ashgourd+brinjal	4.Fuel expenditure
4.Egg, fish* and meat	5.Furniture
5.Fresh fruits	6.Electricity bills+telephone bills+ TV bills
6.Milk and milk products	7.Expenditure incurred on social ceremonies mainly on marriages and festivals
7.Edible oil	8.Expenditure on clothing
8.Sugar and Jaggery	9.Expenditure on transportation
9.Salt	
Total value of food items=total quantity of food consumed(in kg/gm)×price (per kg/gm)	Monthly non food expenditure=Total non food expenditure ÷ 12
MPCE food= total value of food items ÷ household size	MPCE non food= Total non food expenditure ÷ household size

Note: Food consumed from different sources is also considered. The value of home produced commodities is considered at nonfarm price.

\* Fish is consumed from natural sources in both the villages and therefore a few households reported consumption of fish during the time of survey as in flood season fish is not available in river. Overall consumption of these items was found to be very less during the time of survey.

## Bibliography

- Acharya, S. S. (2006). *National food policies impacting on food security: The experience of India, a large populated country* (No. 2006/70). Research Paper, UNU-WIDER, United Nations University (UNU).
- Afridi, F. (2005). Midday Meals in Two States: Comparing the Financial and Institutional Organisation of the Programme. *Economic and Political Weekly*, 40 (15), 1528-1535.
- Afridi, F. (2010). Child welfare programs and child nutrition: Evidence from a mandated school meal program in India. *Journal of development Economics*, 92(2), 152-165.
- Aggarwal, A. (2011). The PDS in Rural Orissa: Against the Grain? *Economic and Political Weekly*, 46(36), 21-23.
- Ahluwalia, D. (1993). Public distribution of food in India: Coverage, targeting and leakages. *Food Policy*, 18(1), 33-54.
- Ahmad, E. (1991). Social security and the poor: Choices for developing countries. *The World Bank Research Observer*, 6(1), 105-127.
- Aayog, N. I. T. I. (2016). Evaluation Study on Role of Public Distribution System in Shaping Household and Nutritional Security India. *Policy*, 72, 80.
- Alkire, S., & Seth, S. (2012). Identifying BPL households: A comparison of methods. *Economic and Political Weekly*, XLVIII (2), 49-57.
- Bagchi, A. K. (1982). *The political economy of underdevelopment*. Cambridge University Press.
- Baishya, P. (1975). Man-made famine. *Economic and Political Weekly*, 10(21), 821-822.
- Balarajan, Y., & Reich, M. R. (2016). Political economy of child nutrition policy: A qualitative study of India's Integrated Child Development Services (ICDS) scheme. *Food Policy*, 62(C), 88-98.
- Banerjee, A., & Somanathan, R. (2007). The political economy of public goods: Some evidence from India. *Journal of development Economics*, 82(2), 287-314.
- Banerjee, O., Darbas, T., Brown, P. R., & Roth, C. H. (2014). Historical divergence in public management of foodgrain systems in India and Bangladesh: Opportunities to enhance food security. *Global Food Security*, 3(3), 159-166.
- Bapna, S. L. (1990). Food Security through the PDS: The Indian Experience in DS Tyagi and VS Vyas (eds), *Increasing Access to Food: The Asian Experience*.
- Barrett, C. B. (2010). Measuring food insecurity. *Science*, 327(5967), 825-828.

- Basole, A., & Basu, D. (2015). Fuelling calorie intake decline: Household-level evidence from rural India. *World Development*, 68 (C), 82-95.
- Basu, D., & Basole, A. (2012). *The calorie consumption puzzle in India: An empirical investigation* (No. 2012-07). Working Paper, University of Massachusetts, Department of Economics.
- Basu, D., & Das, D. (2015). Social Hierarchies and Public Distribution of Food in Rural India. *The Journal of Development Studies*, 51(12), 1653-1666.
- Basu, K. (2011). India's foodgrains policy: An Economic theory perspective. *Economic and Political Weekly*, 46(5), 37-45.
- Bedamatta, Rajshree (2009), *A Study of Food Security in Rural Orissa*, unpublished PhD thesis, University of Calcutta.
- Bedamatta, R. (2010). A District Level Analysis of Rural Orrisa. *Review of Development and Change*, XV(1),49-68.
- Bedamatta, R. (2016). Two Decades of Geographical Targeting in Food Distribution: Drawing Lessons from an Indian State. *Indian Journal of Human Development*, 10(3), 366-383.
- Bhalla, G. S., & Singh, G. (2012). *Economic liberalisation and Indian agriculture: a district-level study*. SAGE Publications India.
- Bhatt, M. S. (2004). *Poverty and food security in India: problems and policies*. (Ed.). Aakar Books.
- Bhatia, B. M. (1967), *Famines in India*, Asia Publishing House, Bombay.
- Bhattacharya, P., Mitra, S., & Siddiqui, M. Z. (2016). Dynamics of Foodgrain Deficiency in India. *Margin: The Journal of Applied Economic Research*, 10(4), 465-498.
- Braun, J. V. (1991). Social security in Sub-Saharan Africa: reflections on policy challenges, in Ahmad, Ehtisam; Dreze, Jean; Hills, John; and Sen, Amartya (eds.), *Social Ssecurity in Developing Countries*, Clarendon press, Oxford.
- Braun, V. J.(2008). Rising food prices: What should be done? International food Policy Research Institute Policy Brief.
- Breunig, R., & Dasgupta, I. (2005). Do intra-household effects generate the food stamp cash-out puzzle?. *American Journal of Agricultural Economics*, 87(3), 552-568.
- Brown, L., & Gentilini, U. (2007). On the edge: The role of food-based safety nets in helping vulnerable households manages food insecurity. In *Food insecurity, vulnerability and human rights failure* (pp. 82-105). Palgrave Macmillan UK.

- Burchi, F., & De Muro, P. (2016). From food availability to nutritional capabilities: Advancing food security analysis. *Food Policy*, 60 (C), 10-19.
- Burgess, Robin and Stern, Nicholas (1991), "Social Security in Developing Countries: What, Why, Who and How?", in Ahmad, Ehtisam; Dreze, Jean; Hills, John; and Sen, Amartya(eds.), *Social Security in Developing Countries*, WIDER, Clarendon Press, Oxford.
- Carrasco, B., & Mukhopadhyay, H. (2012). Food price escalation in South Asia. *Economic and Political Weekly*, 47(46), 59-70.
- Chakrabarti, S., Kishore, A., & Roy, D. (2016). Arbitrage and Corruption in Food Subsidy Programs: Evidence from India's Public Distribution System. In *2016 Annual Meeting, July 31-August 2, 2016, Boston, Massachusetts* (No. 235763). Agricultural and Applied Economics Association.
- Chakraborty, Gorky (2014); The Demographic Question in the Char Areas of Assam, Book Review, *Social Change and Development*, XI (2), pp. 113-117 as available in [http://www.okd.in/downloads/jr\\_14\\_july/Gorky.pdf](http://www.okd.in/downloads/jr_14_july/Gorky.pdf) on 01/09/2015 at 8pm.
- Chand, R. (2005). Whither India's Food Policy? From Food Security to Food Deprivation. *Economic and Political Weekly*, 40 (11), 1055-1062.
- Chandrasekhar, C. P., & Ghosh, J. (2003). The calorie consumption puzzle. *The Hindu Business Line*, 11.
- Chandrasekhar, C. P.; Ghosh, Jayati (2013), "The Political Economy of Indian Food Export" available at [http://www.networkideas.org/news/apr2013/news02\\_Food\\_Exports.htm](http://www.networkideas.org/news/apr2013/news02_Food_Exports.htm) as on 8th August, 2008.
- Chatterjee, M. (2014). An improved PDS in a 'reviving'state. *Economic and Political Weekly*, 49(45), 49-59.
- Chopra, R. N. (1981), *Evolution of food Policy in India*, Macmillan India.
- Christiaensen, L. (2009). Revisiting the Global Food Architecture. Lessons from the 2008 Food Crisis. *Review of Business and Economic Literature*, 54(3), 3345-361.
- Cohen, M. J., & Smale, M. (2011). Global food-price shocks and poor people—an overview. *Development in Practice*, 21(4-5), 460-471.
- Cornia, G. A., & Stewart, F. (1993). Two errors of targeting. *Journal of International Development*, 5(5), 459-496.
- Dandekar, V., & Rath, N. (1971). Poverty in India - I: Dimensions and Trends. *Economic and Political Weekly*, 6(1), 25-48.
- Dandekar, V., & Rath, N. (1971). Poverty in India-II: Policies and Programmes. *Economic and Political Weekly*, 6(2), 106-146.

- Dasgupta, P., & Weale, M. (1992). On measuring the quality of life. *World development*, 20(1), 119-131.
- Deaton, A. (1997). *The analysis of household surveys: a microeconomic approach to development policy*. World Bank Publications.
- Deaton, A., & Dreze, J. (2002). Poverty and inequality in India: a re-examination. *Economic and Political Weekly*, 37(36), 3729-3748.
- Deaton, A., & Drèze, J. (2006). Tracking mid-day meals in Indian schools. *Draft notes*.
- Deaton, A., & Kozel, V. (2005). Data and dogma: the great Indian poverty debate. *The World Bank Research Observer*, 20(2), 177-199.
- Dev, S. M. (1996). Food Security: PDS vs EGS: A tale of two states. *Economic and Political Weekly*, 31(27), 1752-1764.
- Dev, S. M., & Mooij, J. (2002). Social Sector Expenditures in the 1990s: Analysis of Central and State Budgets. *Economic and Political Weekly*, 37(9), 853-866.
- Dilley, M., & Boudreau, T. E. (2001). Coming to terms with vulnerability: a critique of the food security definition. *Food policy*, 26(3), 229-247.
- Dorosh, P. A. (2001). Trade liberalization and national food security: rice trade between Bangladesh and India. *World Development*, 29(4), 673-689.
- Dreze and Sen (1991). *The political economy of hunger: Volume 1: Entitlement and Well-being*, Oxford, Clarendon Press, pp. 13-122.
- Dreze and Sen (1991). *The political economy of hunger: Volume 2: Famine Prevention*, Oxford, Clarendon Press, Chapter 2.
- Dreze and Sen (1991). *The political economy of hunger: Volume 3: Endemic Hunger*, Oxford, Clarendon Press, Chapter 2,9,10.
- Dreze, J. (2006). Universalisation with quality: ICDS in a rights perspective. *Economic and Political weekly*, 41(34), 3706-3715.
- Dreze, J., & Goyal, A. (2003). Future of mid-day meals. *Economic and Political Weekly*, 38(44), 4673-4683.
- Dreze, J., & Khera, R. (2015). Recent social security initiative in India. *World Development*, 98(C), 555-572.
- Dreze, J., & Khera, R. (2017). Understanding leakages in the public distribution system. *Economic and Political Weekly*, 50(7), 39-42.
- Dreze, J., & Kingdon, G. G. (2001). School participation in rural India. *Review of Development Economics*, 5(1), 1-24.
- Dreze, J., & Sen, A. (1989). *Hunger and public action*. Oxford University Press.

- Dreze, J., (2004). Democracy and Right to Food. *Economic and Political Weekly*, 39(17), 1723-1731.
- Dreze, J. (2004). Mid-Day Meals and Children's Rights. *Economic and Political Weekly*, 39(19), 1937-1938.
- Dreze, J., Khera, R., & Pudussery, J. (2015). Food Security. *Economic and Political Weekly*, 50(34), 45.
- Dutta, I., Gundersen, C., & Pattanaik, P. K. (2007). Measures of food insecurity at the household level. *Food Security Indicators, Measurement, and the Impact of Trade Openness: Series: WIDER Studies in Development Economics*. Basudeb Guba-Khasnobis, Shabd S. Acharya, and Benjamin Davis, eds, 42-61.
- Duvvury, N. (1994). Gender implications of new economic policies and the health sector. *Social Scientist*, 22(256-259), 40-55.
- Edirisinghe, N. (1987). *The food stamp scheme in Sri Lanka: costs, benefits, and options for modification* (No. 58). International Food Policy Research Institute (IFPRI).
- Etienne, G. (1988). *Food and poverty: India's half won battle*. Sage Publications India.
- Fiszbein, A., & Schady, N. R. (2009). *Conditional cash transfers: reducing present and future poverty*. World Bank Publications.
- Food and Agricultural Organization (2009), *The State of Food and Agriculture: Livestock in the Balance*, FAO; Rome.
- Food and Agricultural Organization (1996), *World Food Summit Plan of Action*, United Nations, Rome.
- FAO, WFP and IFAD (2012). *The State of Food Insecurity in the World 2012. Economic growth is necessary but not sufficient to accelerate reduction of hunger and malnutrition*. Rome, FAO.
- FAO, IFAD and WFP (2013), *The State of Food Insecurity in the World 2013. The multiple dimension of food security*. Rome, FAO.
- Food Crisis is Back(1968), *Economic and Political Weekly*, 898-899.
- Gahukar, R. T. (2011). Food security in India: the challenge of food production and distribution. *Journal of Agricultural and Food Information*, 12(3-4), 270-286.
- Gaiha, R., Imai, K., & Kaushik, P. D. (2001). On the Targeting and Cost-Effectiveness of Anti-Poverty Programmes in Rural India. *Development and Change*, 32(2), 309-342.
- Ganguly, K., & Gulati, A. (2013). *The political economy of food price policy: The case study of India* (No. 2013/034). WIDER Working Paper.
- Garg, M., & Mandal, K. S. (2013). Mid-day meal for the poor, privatised education for the non-poor. *Economic and Political Weekly*, 48(30), 155.

- Garg, S. (2006). Grassroot Mobilisation for Children's Nutrition Rights. *Economic and Political Weekly*, 41(34), 3694-3700.
- Geetha, S., & M. H. Suryanarayana. (1993). Revamping PDS: Some Issues and Implications. *Economic and Political Weekly*, 28(41), 2207-2213.
- Ghosh, J. (2010). The Political Economy of Hunger in 21st Century India. *Economic and Political Weekly*, 45(44/45), 33-38.
- Ghosh, Jayati (2013), "India's watered down food Bill Won't Really Benefits its Hungry Millions, available at <http://www.theguardian.com/global-development/poverty-matters/2013/jun/24/india-food-bill-hungry-millions> as on 24th June 2013.
- Ghosh. Shanti(2004). Child Malnutrition. *Economic and Political Weekly*, 39(40), 4412-4413.
- Goswami, Rahul (2013), "From District to Town: The movement of Food and food Providers Alike" available at [http://www.macrosan.com/pol/jan13/pol08012013Rahul\\_Goswami.htm](http://www.macrosan.com/pol/jan13/pol08012013Rahul_Goswami.htm) , 8<sup>th</sup> January 2013.
- Goswami, Rahul (2013), "India behind the New Poverty Ratio", available at <http://infochangeindia.org/poverty/analysis/the-india-behind-the-new-poverty-ratio.html> as on 8th August 2013.
- Goswami, Rahul (2013), "Industrializing India's Food Flows: An Analysis of Food Waste Argument", available at [www.macrosan.org/anl/may11/pdf/food\\_flows.pdf](http://www.macrosan.org/anl/may11/pdf/food_flows.pdf) as on September 11, 2013.
- Government of Assam (2010-2011), *Economic Survey*, Directorate of Economics and Statistics, Planning and Development Department.
- Government of Assam (2004-2005), *Economic Survey*, Directorate of Economics and Statistics, Planning and Development Department.
- Government of Assam (2005-2006), *Economic Survey*, Directorate of Economics and Statistics, Planning and Development Department.
- Government of Assam (2006-2007), *Economic Survey*, Directorate of Economics and Statistics, Planning and Development Department.
- Government of Assam (2007-2008), *Economic Survey*, Directorate of Economics and Statistics, Planning and Development Department.
- Government of Assam (2008-09), *Economic Survey*, Directorate of Economics and Statistics, Department of Planning and Development, Dispur.

Government of Assam (2008-2009), *Economic Survey*, Directorate of Economics and Statistics, Planning and Development Department.

Government of Assam (2009-2010), *Economic Survey*, Directorate of Economics and Statistics, Planning and Development Department.

Government of Assam (2010), “*At a Glance*”, Internal Report, Directorate of Food, Civil Supply and Consumer Affairs.

Government of Assam (2010), “Innovative Scheme, Mukhyo Mantrir Anna Suraksha Yojana, Guidelines”, Internal Report, Department of Food, Civil Supply and Consumer Affairs.

Government of Assam (2011), *Economic Survey*, Directorate of Economics and Statistics, Department of Planning and Development, Dispur.

Government of Assam (2017), “Steps for Operationalisation of National Food Security Act-2013 in Assam” available at <http://fcsca.assam.gov.in/information-services/detail/guideline-for-selection-of-beneficiaries-under-nfsa> as on 6th October 2017.

Government of Assam, “*Guidelines and Measures Adopted for Implementation of Targeted Public Distribution System (TPDS)*”, internal report, Department of Food, Civil Supplies and Consumer Affairs.

Government of Assam, *Assam Human Development Report 2003*, Planning and Development, Department, Guwahati.

Government of Assam, *Assam Human Development Report 2014*, Planning and Development, Department, Guwahati.

Government of Assam, Assam (1999). *State Gazetteer; Vol. I*,

Government of Assam, Department of Food Civil Supply and Consumer Affairs, as available in <http://online.assam.gov.in/fooddept>.

Government of Assam (1978, *Goalpara District Gazetteer*), Chapter IX.

Government of Assam, Internal Report, “*A brief note on Functioning of Food and Civil Supplies Department of the State*”.

Government of Assam (1976). *Nagaon District Gazetteer*

Government of India (2002), *Assam State Development Report*, Planning Commission, New Delhi.

Government of India (2004), *Central Government Subsidies in India*, National Institute of Public Finance and Policy, December.

Government of India (2008), Baseline Survey of Minority Concentrated Districts. District Report Dhubri. OKDISCD, Guwahati.

Government of India (2009-2010), Annual Report, Department of Food Civil Supply and Consumer Affairs.

Government of India (2011), *Press Note on Poverty Estimates*, Planning Commission, New Delhi.

Government of India (2011-12), *Annual Health Survey Bulletin of Assam*.

Government of India (2012), *Press Note on Poverty Estimates*, Planning Commission, New Delhi.

Government of India (2013), The National Food Security Act.

Government of India (2015), “Audit on the Preparedness for Implementation of National Food Security Act, 2013 for the Year Ended March, 2015” available at <http://www.cag.gov.in/content/report-no-54-2015-union-civil-national-food-security> as on 1st October 2017.

Government of India (2000). Antyodaya Anna Yojna, Guideline, Ministry of Consumer Affairs, Food and Public Distribution, internal record.

Goyari, Phanindra (2005). Flood Damages and Sustainability of Agriculture in Assam. *Economic and Political Weekly*, 40(26), 2723-2729.

Gragnotati, M., Bredenkamp, C., Gupta, M. D., Lee, Y. K., & Shekar, M. (2006). ICDS and persistent undernutrition: Strategies to enhance the impact. *Economic and Political Weekly*, 41(12), 1193-1201.

Grantham-Mc Gregor, S. M., Chang, S., & Walker, S. P. (1998). Evaluation of school feeding programs: some Jamaican examples. *The American journal of clinical nutrition*, 67(4), 785S-789S.

Grebmer *et al.*(2010), *2010 Global Hunger Index: The Challenge of Hunger*, International Food Policy Research Institute, Washington, D.C; Bonn and Dublin.

Grebmer *et al.*(2016), *2016 Global Hunger Index: Getting to Zero Hunger*, International Food Policy Research Institute, Washington, D.C; Bonn and Dublin.

Grebmer *et al.*(2017), *2017 Global Hunger Index: The Inequalities of Hunger*. International Food Policy Research Institute, Washington, D.C; Bonn and Dublin.

Guha, Amalendu (1977), *Plantar Raj to Swaraj*, ICHR, New Delhi.

Guha-Khasnobis, B., & Vivek, S. (2007). The rights-based approach to development: Lessons from the right to food movement in India. In *Food Insecurity, Vulnerability and Human Rights Failure* (pp. 308-327). Palgrave Macmillan UK.

Guhan, S. (1994). Social security options for developing countries. *International Labour Review*, 133(1), 35-53.

- Gulati, A., & Saini, S. (2015). Leakages from public distribution system (PDS) and the way forward. *Under Review as an ICRIER Working Paper under ICRIER-ZEF Project.*
- Himanshu. (2007). Recent Trends in Poverty and Inequality: Some Preliminary Results. *Economic and Political Weekly*, 42(6), 497-508.
- Himanshu and Sen, A. (2011). Why Not a Universal Food Security Legislation? *Economic and Political Weekly*, 46(12), 38-47.
- Huddleston, Barbara (1987), "Approaches to Quantifying the world Food Problem", in Clay, Edward; Shaw, John (eds.), *Poverty Development and Food*, Macmillan Press, Hong Kong, pp.10-11.
- Hussain, M. (2004). Food Security and the North-East. *Economic and Political Weekly*, 39(41), 4515-4516.
- Indrakant. S.(2004). Nutrition Programmes and Children. *Economic and Political Weekly*, 39(4), 379-380.
- International Institute for Population Sciences (IIPS) and Macro International (2007), *National Family Health Survey (NFHS-3)*, 2005–06, Volume I, India, Mumbai.
- International Institute for Population Sciences (IIPS) and ORC Macro International (2000), *National Family Health Survey (NFHS-2)* 1998–99, India, Mumbai.
- International Institute for Population Sciences (IIPS) MCH and Family Planning, (1995), *National Family Health Survey (NFHS-1)* 1992–93, India, Bombay.
- Jain, J., & Shah, M. (2005). Antyodaya Anna Yojana and mid-day meals in MP. *Economic and Political Weekly*, 40 (48), 5076-5092.
- Jain, S. K., Saraf, A. K., Goswami, A., & Ahmad, T. (2006). Flood inundation mapping using NOAA AVHRR data. *Water Resources Management*, 20(6), 949-959.
- Jain, M. (2015). India's Struggle Against Malnutrition—Is the ICDS Program the Answer?. *World Development*, 67 (C), 72-89.
- Jensen, H. H. (2002). Food insecurity and the food stamp program. *American Journal of Agricultural Economics*, 84(5), 1215-1228.
- Jha, S., & Srinivasan, P. V. (2001). Taking the PDS to the poor: Directions for further reform. *Economic and Political Weekly*, 3779-3786.
- Jha, R., Bhattacharyya, S., & Gaiha, R. (2011). Social safety nets and nutrient deprivation: An analysis of the National Rural Employment Guarantee Program and the Public Distribution System in India. *Journal of Asian Economics*, 22(2), 189-201.

- Jha, R., Gaiha, R., Pandey, M. K., & Kaicker, N. (2013). Food subsidy, income transfer and the poor: A comparative analysis of the public distribution system in India's states. *Journal of Policy Modeling*, 35(6), 887-908.
- Jomaa, L. H., McDonnell, E., & Probart, C. (2011). School feeding programs in developing countries: impacts on children's health and educational outcomes. *Nutrition reviews*, 69(2), 83-98.
- Kandpal, E. (2011). Beyond average treatment effects: Distribution of child nutrition outcomes and program placement in India's ICDS. *World Development*, 39(8), 1410-1421.
- Kannan, K. P. (2000). Food security in a regional perspective: a view from 'food deficit' Kerala.
- Kapur, D., Mukhopadhyay, P., & Subramanian, A. (2008). The case for direct cash transfers to the poor. *Economic and Political Weekly*, 43(15), 37-43.
- Kaushal, N., & Muchomba, F. M. (2015). How consumer price subsidies affect nutrition. *World Development*, 74, 25-42.
- Khera, R. (2006). Mid-day meals in primary schools: Achievements and challenges. *Economic and Political Weekly*, 41(46), 4742-4750.
- Khera, R. (2008). Access to the targeted public distribution system: a case study in Rajasthan. *Economic and Political Weekly*, 43(44), 51-56.
- Khera, R. (2009). 'Right to Food' Act: Beyond Cheap Promises. *Economic and Political Weekly*, 44(29), 40-44.
- Khera, R. (2011). India's public distribution system: utilisation and impact. *Journal of Development Studies*, 47(7), 1038-1060.
- Khera, R. (2011). Revival of the public distribution system: evidence and explanations. *Economic and Political Weekly*, 46(44-45), 36-50.
- Khera, R. (2013). Mid-Day Meals: Looking Ahead. *Economic and Political Weekly*, 48(32), 12-14.
- Khera, Reetika (2011). Trends in Diversion of grain from Public Distribution System. *Economic and Political Weekly*, XLVI (21), 107-109.
- Kishore, A., & Chakrabarti, S. (2015). Is more inclusive more effective? The 'New Style' public distribution system in India. *Food Policy*, 55, 117-130.
- Kochar, A. (2005). Can targeted food programs improve nutrition? An empirical analysis of India's public distribution system. *Economic development and cultural change*, 54(1), 203-235.

- Krishnaraj, M. (2005). Evaluating ICDS. *Economic and Political Weekly*, 40(22/23), 2210-2368.
- Kumar Ghosh, D. (2011). Combating the menace of food insecurity: the experience of West Bengal. *Development in Practice*, 21(4-5), 691-704.
- Kumar, B., & Mohanty, B. (2012). Public distribution system in rural India: implications for food safety and consumer protection. *Procedia-Social and Behavioral Sciences*, 65, 232-238.
- Lovendal, C. R., & Knowles, M. (2006). *Tomorrow's hunger: A framework for analysing vulnerability to food security* (No. 2006/119). Research Paper, UNU-WIDER, United Nations University (UNU).
- Landy, F. (2009). India,'Cultural Density'and the Model of Food Transition. *Economic and Political Weekly*, XLIV(20),59-61.
- Leos-Urbel, J., Schwartz, A. E., Weinstein, M., & Corcoran, S. (2013). Not just for poor kids: The impact of universal free school breakfast on meal participation and student outcomes. *Economics of education review*, 36, 88-107.
- McCorrison, S., & MacLaren, D. (2016). Parastatals as instruments of government policy: The Food Corporation of India. *Food Policy*, 65(C), 53-62.
- McGillivray, M., & Noorbakhsh, F. (2004). *Composite indices of human well-being: past, present, and future* (No. 2004/63). Research Paper, UNU-WIDER, United Nations University (UNU).
- Mahadevan, R., & Suardi, S. (2013). Is there a role for caste and religion in food security policy? A look at rural India. *Economic Modelling*, 31(1), 58-69.
- Mahendran, A., & Indrakant, S. (2014). Public distribution system in Tamil Nadu, India: Rice supply scheme of prosperous, problems and policy. *International Journal of Academic Research in Public Policy and Governance*, 1(1), 15-29.
- Majumdar, K.C. (1989), Assam and Meghalaya Control Orders and Commentaries on the Essential Commodities Act, 1955, Assam law Agency, Guwahati.
- Management of Services for Mothers and Children(1986). *Economic and Political Weekly*, 21(12), 510-512.
- Mandal, R. (2014). Cropping Pattern Choice and Risk Mitigation in Flood Affected Agriculture: A Study of Assam Plains, India. *SHSU Economics and International. Business Working Paper*, (14-03).
- Maxwell, S. (1996). Food security: a post-modern perspective. *Food policy*, 21(2), 155-170.

- Maxwell, S. (1996). Food security: a post-modern perspective. *Food policy*, 21(2), 155-170.
- Mechlem, K. (2004). Food Security and the Right to Food in the Discourse of the United Nations. *European Law Journal*, 10(5), 631-648.
- Medrano, Pedro (2004), "Poverty and Food Security in India: Problems and Policies", in Bhatt, M. S. (ed.), *Mainstreaming Food and Nutrition Issues into Poverty Alleviation Efforts*, Aakar Books, New Delhi.
- Medrano, Pedro (2004), "The Experience with Food Safety Nets in India", in M. S. Swaminathan, Pedro Medrano, Daniel J. Gustafson and Pravesh Sharma (eds.) *National Food Security Summit 2004, Selected Papers*, New Delhi: World Food Programme.
- Mehta, A., Jha, S., & Quising, P. (2013). Self-targeted food subsidies and voice: Evidence from the Philippines. *Food Policy*, 41(C), 204-217.
- Mellor, W. John(1987), "Food Aid for Food Security and Development", in Clay, Edward; Shaw, John (eds), *Poverty Development and Food*, Macmillan Press, Hong Kong, pp. 182- 185.
- Menon, P., Bamezai, A., Subandoro, A., Ayoya, M. A., & Aguayo, V. (2015). Age-appropriate infant and young child feeding practices are associated with child nutrition in India: insights from nationally representative data. *Maternal and child nutrition*, 11(1), 73-87.
- Mid-day Meals and Food Politics (2015). Editorial, *Economic and Political Weekly*, 50(23).
- Mitchell, D. (2008). A note on rising food prices. *Policy Research Working Paper*, 4682. The World Bank.
- Mittal, S. (2007). What affects changes in cereal consumption?. *Economic and Political Weekly*, 444-447.
- Mooij, J. (1998). Food policy and politics: The political economy of the public distribution system in India. *The Journal of Peasant Studies*, 25(2), 77-101.
- Mooij, J. (1999). *Food policy and the Indian state: the public distribution system in South India*. Oxford University Press.
- Mooij, J. (1999). Real targeting: The case of food distribution in India. *Food Policy-Economics Planning and Politics of Food and Agriculture*, 24(1), 49-70.
- MSSRF and WFP (2001); *Food Insecurity Atlas of Rural India*.
- MSSRF and WFP (2008); Report on the State of *Food Insecurity in Rural India*.
- Muchomba, F. M., & Kaushal, N. (2017). Effect of Food Subsidies on Micronutrient Consumption. *Indian Journal of Human Development*, 0973703016685668.

Nagavarapu, S., & Sekhri, S. (2016). Informal monitoring and enforcement mechanisms in public service delivery: Evidence from the public distribution system in India. *Journal of Development Economics*, 121, 63-78.

Nair, K. R. G. (2007). Malnourishment among children in India: A regional analysis. *Economic and Political Weekly*, 42(37), 3797-3803.

Narayanan, S., & Gerber, N. (2017). Social safety nets for food and nutrition security in India. *Global Food Security*. <http://dx.doi.org/10.1016/j.gfs.2017.05.001>.

National Council of Applied Economic Research (2015). Evaluation Study of Targeted Public Distribution System in Selected States. Government of India.

National Sample Survey Organisation (1996), *Level and Pattern of Consumer Expenditure*, 1993-94, 50<sup>th</sup> round, Report Number 402, Ministry of Statistics and Programme Implementation, Government of India.

National Sample Survey Organisation (2001), *Level and Pattern of Consumer Expenditure*, 1999-2000, 55<sup>th</sup> round, Report Number 457, Ministry of Statistics and Programme Implementation, Government of India.

National Sample Survey Organisation (2001), *Reported Adequacy of Food Intake in India*, 1999-2000, 55<sup>th</sup> round, Report Number 466, Ministry of Statistics and Programme Implementation, Government of India.

National Sample Survey Organisation (2006), *Level and Pattern of Consumer Expenditure*, 2004-2005, 61<sup>st</sup> round, Report Number 508, Ministry of Statistics and Programme Implementation, Government of India.

National Sample Survey Organisation (2007), *Perceived Adequacy of Food Consumption in Indian Households*, 2004-2005, 61<sup>st</sup> round, Report Number 512, Ministry of Statistics and Programme Implementation, Government of India.

National Sample Survey Organisation (2007), *Public Distribution System and Other Sources of Household Consumption*, 2004-2005, 61<sup>st</sup> round, Report Number 510, Volume I, Ministry of Statistics and Programme Implementation, Government of India.

National Sample Survey Organisation (2011), *Level and Pattern of Consumer Expenditure*, 2009-2010, 66<sup>st</sup> round, Report Number 538, Ministry of Statistics and Programme Implementation, Government of India.

National Sample Survey Organisation (2013), *Perceived Adequacy of Food Consumption in Indian Households*, 2009-2010, 66<sup>st</sup> round, Report Number 547, Ministry of Statistics and Programme Implementation, Government of India.

National Sample Survey Organisation (2013), *Public Distribution System and Other Sources of Household Consumption*, 2009-2010, 66<sup>th</sup> round, Report Number 545, Ministry of Statistics and Programme Implementation, Government of India.

National Sample Survey Organization (2007), *Levels Public Distribution System and Other Sources of Household Consumption*, 2004-05, 61<sup>st</sup> Round, Report Number 510 Vol 1, July 2004-June 2005, Ministry of Statistics and Programme Implementation, Government of India.

National Sample Survey Organization(2006a), *Levels and Patterns of Consumer expenditure*, 2004-05, 61<sup>st</sup> Round, Report Number 508, July 2004-June 2005, Ministry of Statistics and Programme Implementation, Government of India.

Nayak, N., & Saxena, N. C. (2006). Implementation of ICDS in Bihar and Jharkhand. *Economic and Political Weekly*, 41(34), 3680-3684.

Noorbakhsh, F. (1998). The human development index: some technical issues and alternative indices. *Journal of International Development*, 10(5), 589-605

Noorbakhsh, F. (1998). A modified human development index. *World Development*, 26(3), 517-528.

Osmani, S. R. (1988), "Social Security in South Asia", *WIDER*, Working Paper

Osmani, R. S. (1995), "Food Security in Developing Countries: Issues and Options for 1990s", *IDS Bulletin*, Volume 21, No. 3.

Osmani, S. R.(1991), "Social Security in South Asia", in Ahmad, Ehtisam; Dreze, Jean; Hills, John; and Sen, Amartya(eds.), *Social Security in Developing Countries*, Clarendon Press, Oxford.

Osmani, R. S. (2001), "Growth Strategy and Poverty Reduction", Lecture presented at "Asia and Pacific Forum on Poverty: Reforming Policies and Institutions for Poverty Reduction", Asian Development Bank, Feb., Manila.

Patel, Vibhuti (1994). Women and Structural Adjustment in India. *Social Scientist*. 22(250-51), 16

Patnaik, U. (1996). Export-oriented agriculture and food security in developing countries and India. *Economic and Political Weekly*, 31(35-37), 2429-2449.

Patnaik, U. (1997). Political economy of state intervention in food economy. *Economic and Political Weekly*, 32(20-21),1105-1112.

Patnaik, U. (2007). Neoliberalism and rural poverty in India. *Economic and Political Weekly*, 32(30), 3132-3150.

Patnaik, Utsa (2009), *the Republic of Hunger and Other Essays*, Three Essays Collective

- Pingali, P., & Khwaja, Y. (2004). Globalisation of Indian diets and the transformation of food supply systems. *Indian Journal of Agricultural Marketing*, 18(1), 2004.
- Pingali, P., Mitra, B., & Rahman, A. (2017). The bumpy road from food to nutrition security—Slow evolution of India's food policy. *Global Food Security*.
- Pinstrup-Andersen, P. (1988). The social and economic effects of consumer-oriented food subsidies: A summary of current evidence.
- Pinstrup-Andersen, P. (2000). Food policy research for developing countries: emerging issues and unfinished business. *Food Policy*, 25(2), 125-141.
- Pinstrup-Andersen, P. (2009). Food security: definition and measurement. *Food security*, 1(1), 5-7.
- Popli, G., Parikh, A., & Palmer-Jones, R. (2005). Are the 2000 poverty estimates for india a myth, artefact or real?. *Economic and Political Weekly*, 40(43), 4619-4624.
- Prabhakar, M. S. (1974). A Report from Dhubri. *Economic and Political Weekly*, 1767-1769.
- Prabhakar, M. S. (1975). Death in Barpeta. *Economic and Political Weekly*, 423-425
- Priyadarshini, Sushmita (2006), "Food Security : a Case Study of Assam" in Basu, Debasish; Kulkarni, Francis ,B. and Datta- Ray, B. (eds.) *Agriculture Food Security Nutrition and Health in North East India*, Mittal Publication, Delhi.
- Programme Evaluation Organisation (2005). Evaluation Study on Integrated Child Development Schemes (ICDS). GoI, New Delhi.
- Programme Evaluation Organisation (2005). Performance Evaluation of Targeted Public Distribution System (TPDS). GoI, New Delhi.
- Programme Evaluation Organisation (2005). Performance Evaluation of Cooked Mid Day-Meal (CMDM). GoI, New Delhi.
- Puri, R. (2012). Reforming the Public Distribution System: Lessons from Chhattisgarh. *Economic and Political Weekly*, 47(5), 21.
- Radhakrishna, R. (1993). Growth Scenerio for India in 2000. *Social Scientist*, 18(203) , 41.
- Radhakrishna, R. K. Subbarao with S. Indrakant and C. Ravi (1997), 'India's Public Distribution System: A National and International Perspective'. *World Bank Discussion Paper*, 380.
- Radhakrishna, R. (2005). Food and nutrition security of the poor: emerging perspectives and policy issues. *Economic and Political Weekly*, 40(18), 1817-21.

- Rahman, A. (2014). Revival of rural PDS: Expansion and outreach. IGIDR working paper, WP-2014, as available in <http://oii.igidr.ac.in:8080/xmlui/handle/2275/312>.
- Rahman, A. (2014). Revival of rural public distribution system. *Economic and Political Weekly*, 49(20), 62-68.
- Rajan, S. I., & Jayakumar, A. (1992). Impact of noon meal programme on primary education: an exploratory study in Tamil Nadu. *Economic and Political Weekly*, 27 (43/44), 2372-2380
- Rajivan, A.K. (2006). ICDS with a difference. *Economic and Political Weekly*, 41 (34), 3684-3688.
- Ramaswami, B., & Balakrishnan, P. (2002). Food prices and the efficiency of public intervention: the case of the public distribution system in India. *Food policy*, 27(5), 419-436.
- Rao, C.H.H (2000). What affects changes in cereal consumption? *Economic and Political Weekly*, 35(4), 201-2016
- Reddy, D. N. (2008). Baseline Survey of Minority Concentration Districts: An Overview of the Findings. *New Delhi: ICSSR*.
- Riches, G. (1997). Hunger, food security and welfare policies: issues and debates in First World societies. *Proceedings of the Nutrition Society*, 56(1), 63-74.
- Rosset, P. (2008). Food sovereignty and the contemporary food crisis. *Development*, 51(4), 460-463.
- Rosset, P. (2011). Preventing hunger: Change economic policy. *Nature*, 479(7374), 472-473.
- Saikia, A. (2010). The Moneylenders and Indebtedness: Understanding the Peasant Economy of Colonial Assam, 1900–1950. *Indian Historical Review*, 37(1), 63-88.
- Saxena, N. C. (2002). Food Assistance Programmes and their Role in Alleviating Poverty and Hunger in India. *Delhi: Unpublished*.
- Saxena, N. C., & Srivastava, N. (2009). ICDS in India: policy, design and delivery issues. *IDS Bulletin*, 40(4), 45-52.
- Sen, A. (1997). *Hunger in the Contemporary World* (No. 08). Suntory and Toyota International Centres for Economics and Related Disciplines, LSE.
- Sen, A. (2000). Estimates of consumer expenditure and its distribution: Statistical priorities after NSS 55th round. *Economic and Political Weekly*, 35(51), 4499-4518.
- Sen, A. (2001). *Development as freedom*. Oxford Paperbacks.

- Sen, Abhijit (1992). Economic Liberalization and Agriculture in India. *Social Scientist*, 20(234), 4.
- Sen, Abhijit and Himanshu (2004). Poverty and Inequality in India –I. *Economic and Political Weekly*, 39(38), 4247-4263.
- Sen, Abhijit and Himanshu (2004). Poverty and Inequality in India –II, Widening Disparities during the 1990s. *Economic and Political Weekly*, 39(39), 4361-4375.
- Sen, Amartya (1981), *Poverty and Famines: An Essay on Entitlement and Deprivation*, New Delhi, Oxford, Chapters 1, 2, 4 and 5.
- Sen, Amartya (1985), *Commodities and Capabilities*, Oxford University Press, USA
- Sen, Amartya (1992), *Inequality Reexamined*, Clarendon Street, Oxford, Chapters 1, 2
- Sengupta, Keya (2006), “Effectiveness of Targeted Public Distribution System: a Case Study of Silchar Town of South Assam” in Basu, Debasish; Kulkarni, Francis ,B. and Datta- Ray, B. (eds.) *Agriculture Food Security Nutrition and Health in North East India*, Mittal Publication, Delhi.
- Shankar, K. (1997). Revamped Public Distribution System: Who Benefits and How Much?. *Economic and Political Weekly*, 32(13),629-630.
- Shukla, S. (2014). Mid-day meal. *Economic and Political Weekly*, 49(7), 51.
- Si, A. R., & Sharma, N. K. (2008). an empirical Study of the Mid-Day Meal programme in Khurda, Orissa. *Economic and Political Weekly*, 43(25), 46-55.
- Singh, S. B. (2004). Future of Mid-Day Meals. *Economic and Political Weekly*, 39(9), 998-1000.
- Sinha, D. (2006). Rethinking ICDS: A rights based perspective. *Economic and Political Weekly*, 41(34), 3689-3694.
- Siraj-Blatchford, I. (1994). An Evaluation of Early Years Education and Training in the Integrated Child Development Services (ICDS) in India. *International Journal of Early Years Education*, 2(1), 52-66.
- Smith, L. C. (2013). The Great Indian calorie debate: explaining rising undernourishment during India's rapid economic growth. *IDS Working Papers*, 2013(430), 1-35.
- Sundaram, K., & Tendulkar, S. (2001). NAS-NSS Estimates of Private Consumption for Poverty Estimation: A Disaggregated Comparison for 1993-94. *Economic and Political Weekly*, 36(2), 119-129.

- Sundaram, K., & Tendulkar, S. D. (2003). Poverty has declined in the 1990s: A resolution of comparability problems in NSS consumer expenditure data. *Economic and Political Weekly*, 38(4), 327-337.
- Suryanarayana, M. H. (1995). PDS reform and scope for commodity-based targeting. *Economic and Political Weekly*, 30(13), 687-695.
- Suryanarayana, M. H. (1995). PDS: Beyond implicit subsidy and urban bias—The Indian experience. *Food Policy*, 20(4), 259-278.
- Suryanarayana, M. H. (1995b). Some Experiments with Food Stumps. *Economic and Political Weekly*, 30(52), A151- A159.
- Swaminathan, M. (1991). Child care services in Tamil Nadu. *Economic and Political Weekly*, 26(52), 2988-2992.
- Swaminathan, M. (1995). Revamped Public Distribution System: a field report from Maharashtra. *Economic and Political Weekly*, 30(36), 2230-2230.
- Swaminathan, M. (1996). Structural adjustment, food security and system of public distribution of food. *Economic and Political Weekly*, 31(26), 1665-1672.
- Swaminathan, M. (1999). Understanding the Costs of the food Corporation of India. *Economic and Political Weekly*, 34(52), A121-A132.
- Swaminathan, M. (2000). Weakening Welfare: The Public Distribution of Food in India. Left Word Books, New Delhi.
- Swaminathan, M. (2008). Programmes to protect the hungry: Lessons from India. *DESA (Department of Economic and Social Analysis) Working Paper*, (70).
- Swaminathan, M. (2009). Neo-liberal policy and food security in India: Impact on the public distribution system. In *Conference Paper for International Conference on 'The Crisis of Neo-liberalism in India: Challenges and Alternatives*.
- Tandon, B. N. (1989). Nutritional interventions through primary health care: impact of the ICDS projects in India. *Bulletin of the World Health Organization*, 67(1), 77.
- Thorat, A., Vanneman, R., Desai, S., & Dubey, A. (2017). Escaping and Falling into Poverty in India Today. *World Development*, 93(C), 413-426.
- Tritah, A. (2015). The Public Distribution System in India: Counting the poor from making the poor count. Toulouse, France: Universite des Sciences Sociales.
- Tyagi, D. S. (1990), "Increasing Access to Food through Interaction of Price and Technology Policies- The Indian Experience", Sage Publication, New Delhi.

- Umali-Deininger, D. L., & Deininger, K. W. (2001). Towards greater food security for India's poor: balancing government intervention and private competition. *Agricultural Economics*, 25(2-3), 321-335.
- UNHCR, WFP (2008), *UNHCR/WFP Joint Assessment Mission Guidelines*.
- Viswanathan, B. (2006). Access to nutritious meal programmes: Evidence from 1999-2000 NSS Data. *Economic and Political Weekly*, 41(6), 497-506.
- Vyas, V. S. (1990), "Food Policies and Food Security in Asia with Particular Reference to South Asia", in Tyagi, D.S; Vyas, Vijay Shankar (eds.), *Increasing Access to Food: the Asian Experience* (eds.) Sage publication, New Delhi, pp.431-435.
- "What is the Nature of the Agrarian Transition in Post Independence India: what are the Implication of the New Policies for Indian Agriculture?" available at [http://www.macrosan.org/eco/june02/eco120602Agrarian\\_transition\\_post-Independence\\_India\\_1.htm](http://www.macrosan.org/eco/june02/eco120602Agrarian_transition_post-Independence_India_1.htm) as on 7th July 2013.
- Waterlander, W. E., Mhurchu, C. N., Eyles, H., Vandevijvere, S., Cleghorn, C., Scarborough, P., & Seidell, J. (2017). Food Futures: Developing effective food systems interventions to improve public health nutrition. *Agricultural Systems*.
- World Food Programme (2009); *Comprehensive Food Security and Vulnerability Analysis Guidelines*.
- World Food Programme (2009); *Emergency Food Security Assessment Handbook*.
- World Food Programme (2013), *VAM- Understanding Vulnerability: Food Security Analysis*.
- World Food Programme (2017), *The State of Food Security and Nutrition in the World*.
- World Food Programme and Food and Agricultural Organisation (2009); *FAO/WFP Joint Guidelines for Crop and Food Security Assessment Missions (CFSAMs)*.
- WFP and IHD(2009), *Food Security Atlas of Rural Bihar*.
- WFP and IHD(2008); *Food Security Atlas of Rural Chhattisgarh*.
- WFP and IHD(2008); *Food Security Atlas of Rural Jharkhand*.
- WFP and IHD (2010); *Food Security Atlas of Rural Maharashtra*.
- Zaidi, Annie (2005). Food for Education. *Frontline*, 22(05).
- Zhou, Z. Y., & Wan, G. (2006). The public distribution systems of foodgrains and implications for food security. *Research Paper No, 98*.