

FOOD CONSUMPTION PATTERN IN RURAL INDIA IN THE REFORM PERIOD : TREND, COMPOSITION AND IMPLICATION FOR NUTRITIONAL SECURITY

Ranjana Roy*

Present paper attempts to investigate the pattern of food consumption of rural India and its impact on nutritional status. The paper tries to investigate whether as the grain intake has been going down, there has been any compensating increase in other food items as the diversification argument says. If consumption of non-food grain is indeed going up, to what extent nutritionally the rise is compensating for the decline in grain consumption. The analysis has been done for rural India. Looking at the actual physical quantities consumed per head, the food grains group namely cereals, cereal substitutes, pulses consumption was found to have declined substantially and consistently for every states and for all decile classes of consumers including the poorest. There is some patchy evidence of some of the animal products intake rising from extremely low levels, though even the terminal level still remains very low. The study shows that states with well functioning PDS are experiencing improvement in nutritional status. As necessary food items are available on a subsidised rate for a greater section of people, it is easier to diversify their food basket according to taste and preferences.

Key Words : Food Intake, /Nutritional Outcome, Diversity of Food Basket, Food Security, Universal and Targeted PDS

INTRODUCTION

Since the economic reform there has been a change in the food consumption pattern of the population with serious decline in the intake of cereals and rise in some expensive food items (milk & products, edible oil, meat products). This change is more significant for rural India. Apparently, this is a positive trend of diversification away from starchy staple food and towards protein rich food, especially products of animal origin. However this change has been accompanied by a fall both in average calorie and protein intake. These are not positive indicators since the fall is also observed for the poorer spending classes with inadequate initial nutrition levels. The question of consumption pattern of rural India has been subjected to lot of analysis over last few years and there is an ongoing debate on its implication for food and nutritional security. The objective of this paper is to investigate a) whether as the grain intake has been going down, there has been a compensating increase in other food items as the diversification argument says, b) If consumption of non-food grain is indeed going up, to what extent nutritionally the rise is compensating for the decline in grain consumption. The analysis has been done for rural India.

The paper is organised as follows: In the first section it gives a discussion on the theoretical background of the current debate on 'Nutrition Puzzle'. In the next section it presents the trends in

*Research Fellow, Centre for WTO Studies, IIFT, New Delhi Email: thisisranjana@gmail.com

production and availability of food grain in the reform period. After a discussion on the database and methodology in the third section, consumption of different food items across spending classes and states have been presented in the next section. Intake of direct, indirect and total demand for food grain are also estimated and presented in this section. The next section looks into the contribution of different food items in terms of nutritional indicators. Concluding observations are placed in the final section.

Background

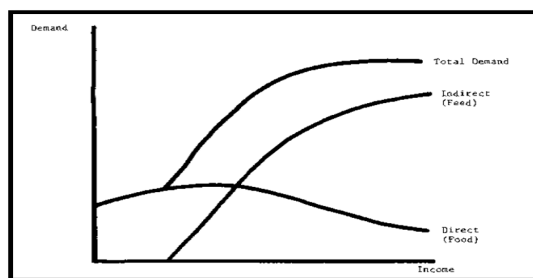
Engel's law states that as household income increases beyond a certain level, share of food expenditure in total expenditure begins to fall even though absolute expenditure on food may rise. Just as for an individual, for a society too, with increase in per capita GDP, Engel's law begins to operate and such a stage is interpreted as the threshold of prosperity. However, Engel is silent on how composition of food changes with change in income. Later economists have taken this discussion further and found through empirical study that as income rises the share of protein rich food (animal products) in total food spending rises and the share of staple cereals or grains in total food spending declines (Bennett et al).

Grain can be consumed in two forms- first Direct grain consumption as rice, roti, bread etc and second indirect grain consumption as animal products embodying definite quantity of feed-grain (meat, eggs, fish and dairy products). Another component of indirect grain demand is processed food, alcohol and fuel. The total demand for foodgrain by humans is the sum of direct consumption demand and indirect consumption demand. There are fallacies of aggregation implicit in the definition of demand (Yotopoulos, 1985)

- i) Aggregating food consumption hides the fact that people consume a wide variety of food items.
- ii) The mix of commodities and their elasticities of demand change as income changes.
- iii) Population is a non homogenous variable consisting of people belonging to different income strata. As a result class specific income growth and population growth would have different impact on demand for food.

With increasing income the total demand, both direct and indirect resembles the stylised trend represented in the Yotopoulos diagram. It is observed that as income rises greater share of grain is demanded in the form of animal products, so total grain demand is observed to rise with rise in income.

Figure: 1, Direct and Indirect Demand for Grain with Rising Income



Source: Yotopoulos, 1985

There have been some significant changes in consumption basket of Indian population. The grain consumed in physical unit per head has been falling steadily and the proportion in total consumer spending has been falling as well. However in India over the reform period this change

has been accompanied by a fall both in average calorie as well as in average protein intake. Fat is the only nutrient which has been rising. Calorie and protein intake per capita are highly correlated since food grains are the main source of both for the Indian population. These are not positive indicators since the fall while it is quite large for the well-to-do, is also observed for the poorer classes with already inadequate initial nutrition levels. A careful glance over the last quinquennial rounds shows that total daily calorie intake has gone down considerably over the years. The recommended daily protein and fat requirements are 60 grams and 40 grams per person respectively (National Nutrition Monitoring Bureau). The table below shows that protein intake too is gradually going down from the recommended rate in the post liberalisation phase. Calorie and protein intake increased marginally in 2011-12 but they are below the level persisted in the pre-reform period. Increase in real wages in the farm and non-farm sector explain this positive development.

Table: 1, Changes in Average Per Capita Intake of Calorie, Protein & Fat per Diem over NSS Rounds in Rural India

| Year | Round | Calorie | Protein | Fat |
|---------|-------|---------|---------|------|
| 1983-84 | 38 | 2221 | 62 | 27 |
| 1993-94 | 50 | 2153 | 60.2 | 31.4 |
| 2004-05 | 61 | 2047 | 57 | 35.5 |
| 2009-10 | 66 | 2020 | 55 | 38.3 |
| 2011-12 | 68 | 2099 | 56.5 | 41.6 |

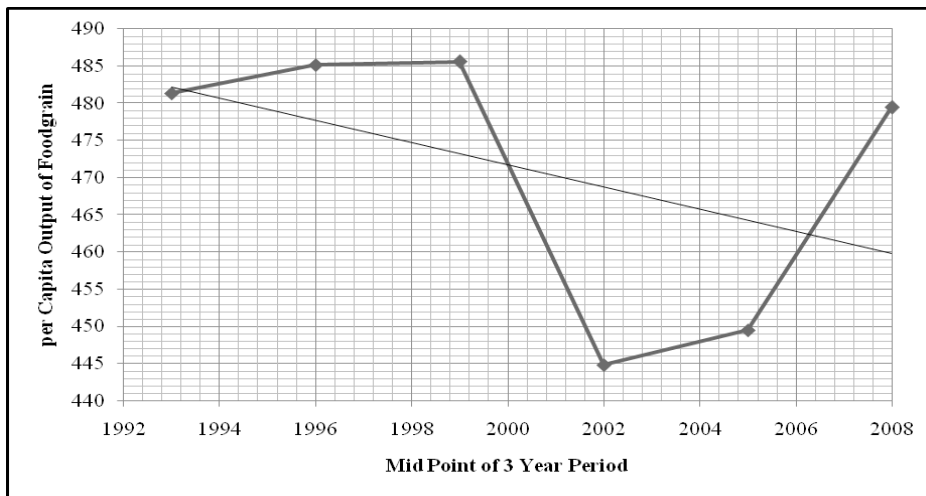
Source: Various NSSO Reports

This has serious policy implications as the actual evidence is against the common belief that the majority of the people are willingly shifting away from consumption of starchy staples to more expensive dairy products, meat, vegetables and fruits.

The view of the majority of academics on improvement in the condition of poor has been also contested using the direct data on nutrition from the National Family Health Survey (NFHS). According to the NFHS-3 results, 36 percent of women and 34 percent of men in the age group 15-49 years show a Body Mass Index (BMI) below 18.5 indicating chronic nutritional deficiency. Almost 48 percent of the children below five years of age are stunted. The prevalence of anaemia among children of 6-35 months has increased from 74 percent in NFHS-2 to 79 percent in NFHS 3. So these figures do not support the idea of positive nutritional gain with change in the consumption pattern, rather they raise questions regarding the neo liberal reform measures which seem to have led to a significant deterioration in nutritional outcomes.

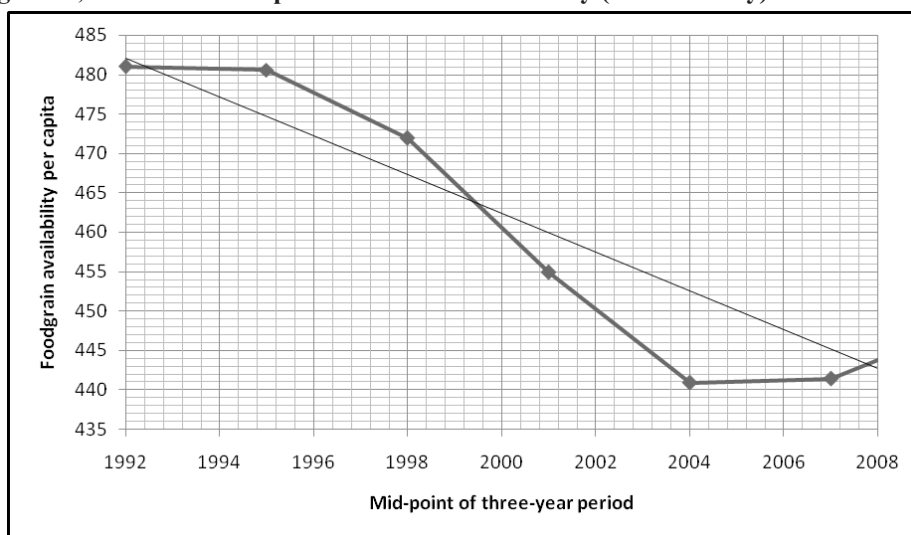
FOOD GRAIN PRODUCTION UNDER ECONOMIC REFORM

A slowdown in growth rate of production of food grain was encountered over the 1990s and aggregate growth performance was below the target throughout the decade. For some decades before this the Indian economy had experienced a secular growth rate of food grain production of around 2.5 per cent per annum which was a little higher than the population growth. Acceleration of growth was experienced for every single major crop categories except for coarse cereals. However in the following period agricultural sector has gone through rapid decline in rate of growth. The growth rate dropped to 1.75 per cent per annum which was lower than the population growth of 1.9 per cent in that period. By the end of this decade agricultural sector was plagued by drop in food grain production, holding a large stock of food grain by FCI combined with low price faced by cultivators which led to a drop in food grain availability in the same period. Food grain availability

Figure: 2, Trend in Per Capita Production of Food Grain (in Gram/Day) from 1991-2010

Source: Plotted using production data from Economic Survey

declined slowly between 1991-92 to 1997-98 and dropped sharply to 151kg by 2001. Another policy that led to worse access to food was implementation of targeted public distribution system in order to reduce fiscal deficit which was introduced in 1997-98. The result has been drastic drop in sales from PDS. By 2002 63.1 million tonnes of food grains were rotting in FCI go downs. The trends in production and availability are shown below.

Figure: 3, Trend in Per Capita Food Grain Availability (in Gram/Day) from 1991-2010

Source: Plotted using production data from Economic Survey

It is clear from the above figures that production of food grains dropped drastically within a decade of neoliberal policies, and then it improved in the next decade. But per capita availability of food grain has shown a continuous decline with no sign of betterment.

DATA AND METHODOLOGY

This paper has drawn data from National Sample Survey, 66th (2009-10) along with 61st (2004-05) and 50th (1993-94), which provided unit level data on consumer expenditure. NSSO household level consumer expenditure survey collects data on different categories of consumption items. In this paper consumption of major food items cereals and cereal substitutes, pulses and pulse products, milk and products, egg, fish & meat, edible oil are calculated across decile classes for detailed analysis. For compatible comparison decile classes have been defined from unit level data. Direct, indirect and total demand for food grain is calculated using feed coefficient (from Bhalla et al estimated, 1999 IFPRI Report) of 0.12kg of cereals per kilo of milk and 1.2 kilo of cereals per kilo of egg, fish and meat. These calculations are carried out for 66th, 61st and 50th round to see how direct, indirect and total demand for food grain (direct + indirect) has changed over the period of economic reform.

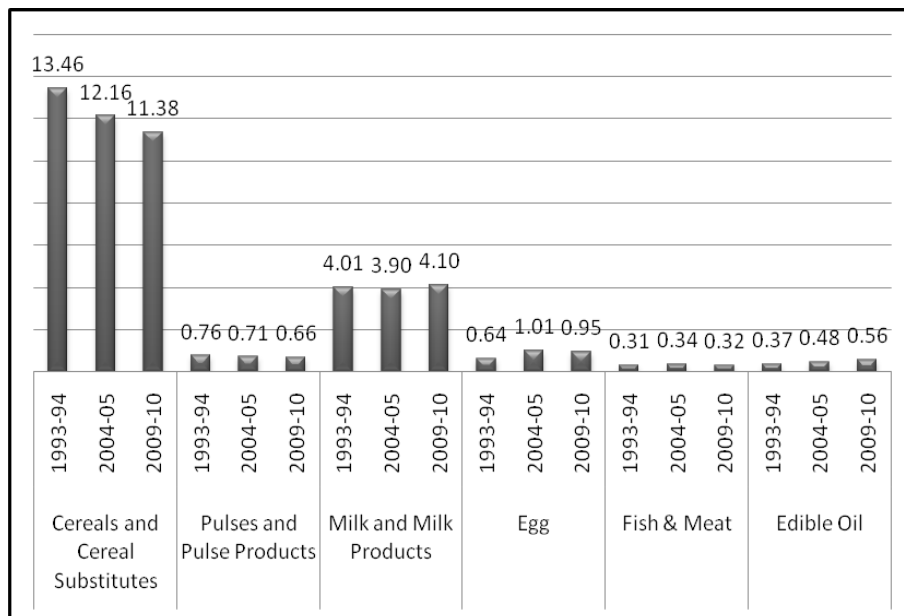
Per capita per day intake of calorie and protein intake from different food items are calculated using data on 'per capita per day intake of calorie and protein intake' and 'percentage of total intake of calorie and protein from different food groups (that are cereals, pulses, milk & products and egg, fish & meat)', provided in the NSS report on 'Nutritional Intake in India'. The change in overall calorie and protein intake and the change in contribution from different food groups are computed for 1993-94 and 2009-10. The analysis is extended for individual states as well.

FOOD CONSUMPTION PATTERN IN RURAL INDIA

There is a positive relation between the expenditure class and quantity consumed for every item, even for the cereals, cereal substitutes and pulses group, ranging from 10.6 kg for the poorest decile to 13.2 kg for the richest in 2009-10. The comparable range was from 11 kg. to 16.75 kg. in 1993-94. Clearly the decline has been greater in the richer spending classes. The range for consuming dairy products and animal products is much larger as the richer classes consume a large multiple of the consumption of the poorer classes. The range for milk and milk products at the earlier date was from 0.6 to 10.8 kg. while for the later date 2009-10 the range was from 0.9 to 9.6 kg. – the rise in consumption is registered up to the eighth decile, but somewhat surprisingly a decline is registered for the two highest spending classes. Health consciousness and cutting back on ghee and sweets by the well-fed might explain this finding in part.

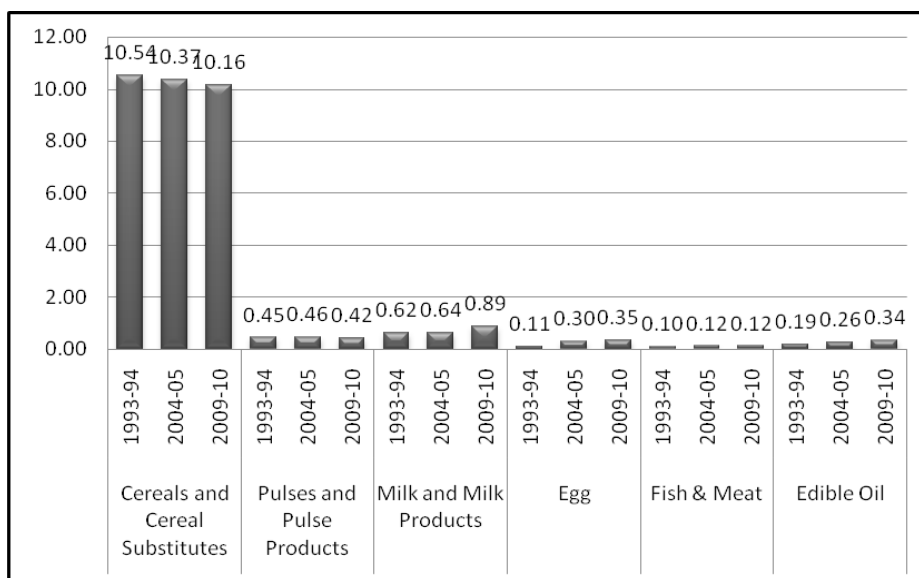
Both cereals and pulses consumption are seen to decline steadily for all deciles including the poorest, the extent of decline being more for higher expenditure classes. The average consumption level of animal products was already very low in 1993-94, with daily consumption of less than 140 gm., hardly 10 gm. fish and meat, while per month less than one egg was consumed. Only the last item has risen to one egg per month by 2009-10, still extremely low. The consumption of milk and milk products declined between 1993-94 to 2004-05 and then increased to a level which is marginally higher than the 1993-94 value. The group fish & meat increased slightly between 1993-94 to 2004-05, then declined to the original level by 2009-10. Thus there has been negligible change in the protein rich animal products and dairy products. There has been steady increase in the consumption of edible oil.

Figure: 4, Average Monthly per Capita Consumption of Different Food Items in Rural India, 1993-94 to 2009-10



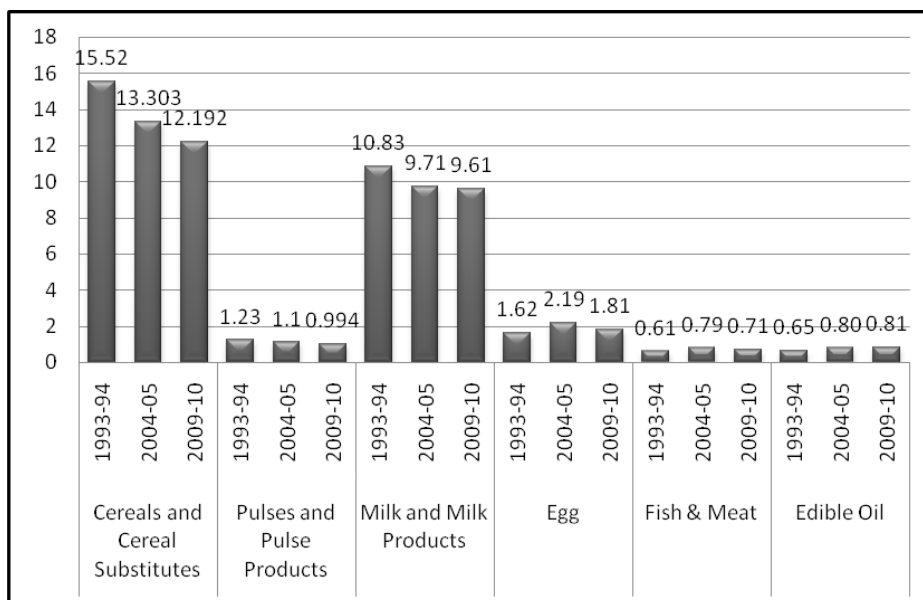
Source: Plotted by using data from table A1.

Figure: 5, Average Monthly per Capita Consumption of Different Food Items in Rural India (Lowest Decile Class), 1993-94 to 2009-10



Source: Plotted by using data from table A1.

Figure: 6, Average Monthly per Capita Consumption of Different Food Items in Rural India (Top Decile Class), 1993-94 to 2009-10



Source: Plotted by using data from table A1.

It has been continuously pointed out in different studies that food basket of Indian population has been enriched with fruits, leafy vegetables, sugar, dairy and meat products. In the disaggregated study of states the analysis has been extended for vegetables, fruits and sugar consumption as well. During the post reform period, consumption of cereals has declined for all the states, particularly so in Haryana, Karnataka, Madhya Pradesh, Rajasthan and West Bengal – the last named state has seen the maximum fall in cereal consumption. Most states have experienced decline in Pulses consumption as well. It is clear from the table that all the states are undergoing a consistent decline in food grain consumption. Staples are not only rich in calorie and protein but they are also valuable source of micro nutrients. Most of these states have also seen a drop in the intake of pulses, except for Himachal Pradesh, Kerala and Tamil Nadu. Now the concern is to see whether there has been a significant rise in the consumption of expensive food items to compensate for the loss in nutrients owing to decline in grain consumption.

Most states have experienced an increase in milk consumption, the exceptions being Haryana, Punjab, Rajasthan, Uttar Pradesh and West Bengal which suffered decline in milk consumption. Haryana, Punjab and Rajasthan initially had much higher than the all India average milk consumption and continue even after the decline, to be the leading consumers. Uttar Pradesh had slightly above the average level while West Bengal shows decline from an already low level. Significant increase in milk intake is observed in Gujarat, Himachal Pradesh, Jammu & Kashmir, Madhya Pradesh and Tamil Nadu.

In 1993-94, the consumption of egg was very low. In 2004-05, individuals ate 1 egg per month on an average in rural India which declined to 0.95 per month in 2009-10. Individual states as well did not show any remarkable change in consumption of eggs. Highest increase in intake is noted in Andhra Pradesh, Assam, Tamil Nadu and West Bengal. While Kerala had the highest consumption

of eggs in 1993-94 it lost this position to West Bengal by 2009-10. There has been negligible change in consumption of fish and meat. The intake of fish & meat increased from 0.31kg in 1993-94 to 0.34kg in 2004-05 and then declined to 0.32kg in 2009-10. The only considerable increase has been noticed in Kerala with very small increases in a number of other states, while small decline is registered by Haryana, Punjab, Rajasthan, Orissa and Uttar Pradesh.

All the states have experienced a noteworthy increase in intake of edible oil. Increase in consumption is most significant in Maharashtra followed by Haryana and Gujarat. Detailed tables showing consumption of different food items across spending classes and states are presented in appendix.

It has been continuously pointed out in different studies that food basket of Indian population has been enriched with fruits, leafy vegetables, sugar, dairy and meat products. But it is clear from Table A2 that the average consumption at the All-India level of sugar, vegetables and fruits, has declined in rural India. Disaggregated state level analysis in the above table shows that diversification is not true across states. Intake of sugar has increased in rural part of Himachal Pradesh, Madhya Pradesh and Tamil Nadu and declined for the remaining states. On average sugar consumption has been falling consistently in rural India. Consumption of vegetables and fruits has declined in rural India, although some states have experienced increase in intake in the same period. Andhra Pradesh, Kerala and Uttar Pradesh have seen some rise in vegetables consumption along with smaller increase in a few other state but in many such cases there has been decline in fruit consumption.

Hence there has been steep decline in cereal intake in the last two decades irrespective of states and regions. But there has not been any consistent increase in the other expensive food items. All states have experienced increased in milk and products, edible oil. In the case of other food items the improvement is uneven. Tamil Nadu, Kerala and Himachal Pradesh registered increase in intake of all food items except for cereals while West Bengal and Rajasthan experienced a steady decline. Whatever improvement in consumption is observed has not been large enough to compensate for the fall in intake of staple cereal. It has been pointed out in many studies that importance of macro nutrients (carbohydrates, protein and fat) declines with diversified food basket enriched in micronutrients (Vitamins, folic acid, iron, iodine and zinc). Hence decline in intake of staple cereals is not a serious phenomenon because micronutrients are required in small quantities to ensure normal metabolism, growth and physical well-being. Iron rich food includes red meat, lentils, leafy vegetables and poultry items. Zinc is found in liver, eggs, cereal, sea foods. Folate or folic acid is found in eggs, dairy products, leafy vegetables, oranges and so on. Some of these food items along with carrots, broccoli, and spinach are rich in vitamin A. If calorie and protein intake are declining continuously, it is illogical to assume that all these micro nutrients are improving as intake of most of these food items are either declining (cereals, pulses) or has remained in a static state (eggs, poultry items). Consumption of vegetables has only increased in a few pockets and consumption of fruits has shown improvement only in the urban part of India.

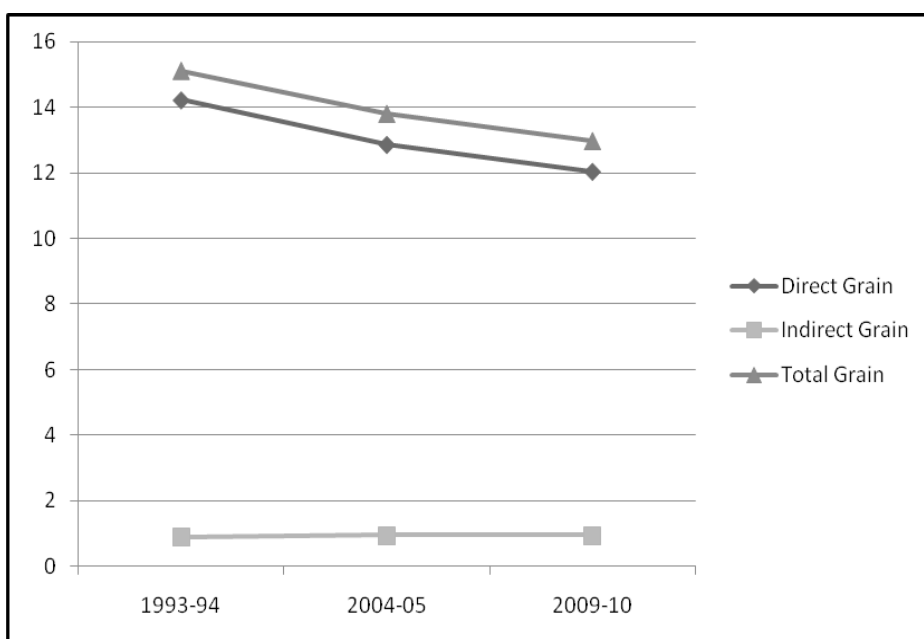
Estimation of Total Grain Consumption, Direct and Indirect in Rural India

As discussed earlier, grains can be consumed in two forms- first Direct grain consumption as rice, roti, bread etc and second indirect grain consumption as animal products (milk, meat, eggs, fish etc) embodying definite quantity of feedgrains. Animal products can be converted into the grains they embody, since apart from roughages, starchy grains are used as feed for cattle. As it takes 6 to 7 times land to produce a calorie from a large animal as compared to obtaining a calorie from plants, animal products are very costly. The recent food-feed competition mainly deals with different consumption pattern of different income segments of the population and the sharply rising demand

for animal products on the part of the global and local rich, has serious implications regarding the question of food security. The exact conversion rates are debated since they vary depending on the degree of industrialization of livestock production. In 1993-94 in India less than 5 million tons of cereals were fed to livestock each year amounting to 3 percent to 4 percent of total cereal production. India's livestock production was primarily dependent on crop by products, household waste and open grazing as source of feed (Bhalla et al, 1999). But it is not very logical to assume that these traditional sources would continue to remain the only sources of feed. Direct and indirect intake of food grain has been calculated applying modest feed coefficients.

The overall average direct intake has declined substantially without being offset by any increase in indirect consumption. In rural areas direct intake of grain has fallen from 14.22 kg to 12.04 kg per capita per month while the indirect intake of grain has hardly increased, merely from 0.90 kg. to 0.94 kg. Namely it has remained almost unchanged, resulting in a decline in the total (direct + indirect) demand for grains from 15.18 kg. to 12.98kg. The Yotopoulos relation is presented in the following graph.

Figure: 7, Yotopoulos Relation in Rural India in the Reform Period



Plotted by using data from Table : A3

As already established, the Direct intake of food grain has declined for all the states. For Punjab, Haryana, UP and Rajasthan, there is a fall in intake of both direct and indirect foodgrain consumption. For the other states the absolute intake of indirect foodgrains has increased, that means a 'dietary diversification' might take place; it could make only a small dent in the extent of nutritional decline.

NUTRITIONAL INTAKE IN POST REFORM PERIOD

Decline in food grain intake has been sought to be justified by arguing that consumers are voluntarily shifting from food grain which are considered as 'inferior good' as their income rises,

to animal products. The fact of falling overall calorie and protein intake was completely ignored in any argument. Some economists have argued that there is a deliberate trade off of low calories for a more diversified food basket. But it is never mentioned that the energy and protein intake of fast growing India's population is much lower than the developed west and only little higher than central African countries. Unlike developed countries, in India diversification has been accompanied by falling average nutrition. (Patnaik,2003)

Table: 5, Calorie and Protein Intake from Different Food Groups for 2009

| | | Calorie Intake from Vegetal Products | Calorie Intake from Animal Products | Calorie Intake | Protein Intake from Vegetal Products | Calorie Intake from Animal Products | Protein Intake |
|---------------------------------|------|--|---|-------------------|--|--|-------------------|
| United States | 2675 | 1013 | 3688 | 40.6 | 72.3 | 112.9 | |
| European Union | 2453 | 1003 | 3456 | 43.44 | 61.8 | 105.24 | |
| China | 2342 | 692 | 3034 | 56.8 | 37 | 93.8 | |
| India | 2113 | 209 | 2322 | 45.5 | 11.1 | 56.6 | |
| Least Developed Countries | 2120 | 178 | 2298 | 47.2 | 12.8 | 60 | |
| Central Africa | 2071 | 155 | 2226 | 42.6 | 13.2 | 55.8 | |

Source: Food Balance Sheet 2009, Food and Agricultural Organisation

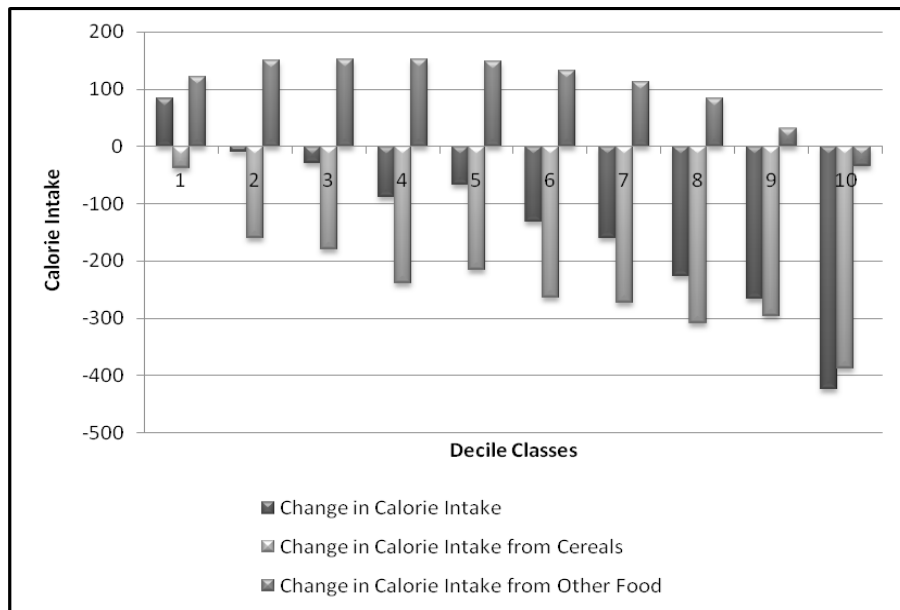
The main problem with the argument of 'dietary diversification' is that a necessary condition of improvement, the falling share of foodgrain expenditure and falling absolute physical intake of food grains, has been implicitly assumed to be a sufficient condition indicating prosperity, which is incorrect. Rising real income and real expenditure, will definitely lead to and is a sufficient condition for a lowering of the share of food spending in total spending, but the opposite need not be true. An observed lowering of the share of food spending in total spending does not imply that total spending in real terms is going up, namely the former is not a sufficient condition for the latter. The lower food share may well be the result of stagnant or declining real income and increasing relative cost of essential non-food expenditures which play an enabling role in earning a living (health, transport, utilities).

In 2004-05 the food grains (cereals, cereal substitutes, pulses and pulse products) accounted for 75.3 percent of the total calorie intake and 75.8 percent of the total protein intake of the average rural consumer. (NSS Report 513). Despite the continuous decline in grain consumption per capita, in 2009-10 about 64 percent of total calorie intake by the rural Indian was still derived from food grain. For the poorer decile groups the dependence on food grain as the main nutritional source is much higher than the average.

If the focus of analysis is shifted from total calorie intake to protein intake the conclusion remains almost same. The bulk of protein intake, 72 percent, continued to be derived from food grain in 2009-10 by the average consumer. The dependence by a poor population on food grain for protein is thus substantially higher than their dependence on food grain for energy. Only 14 percent of total protein intake in rural India is observed to be derived from the two food groups milk and milk products and egg, fish & meat. For the lowest MPCE classes the share of calorie and protein

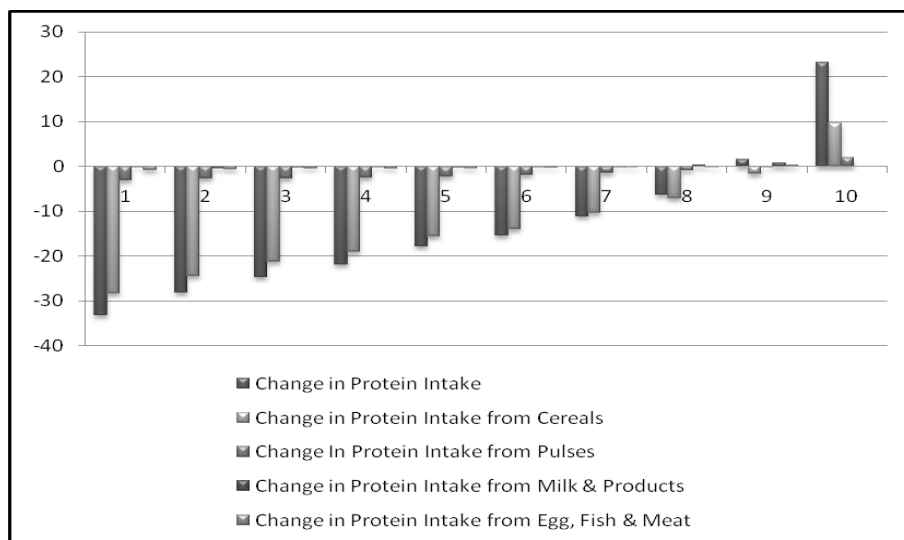
intake from foodgrains is even higher than the high all India average of 72 percent. It is very obvious that nutritional security actually depends on food security which has been gradually dismantled over the reform period especially after the introduction of Targeted Public Distribution System.

Figure: 8, Net Change in Calorie Intake across decile classes in Rural India, 1993-94 to 2009-10



Plotted using author's calculations from NSSO 50th and 66th round

Figure: 9, Net Change in Protein Intake across decile classes for Rural India, 1993-94 to 2009-10



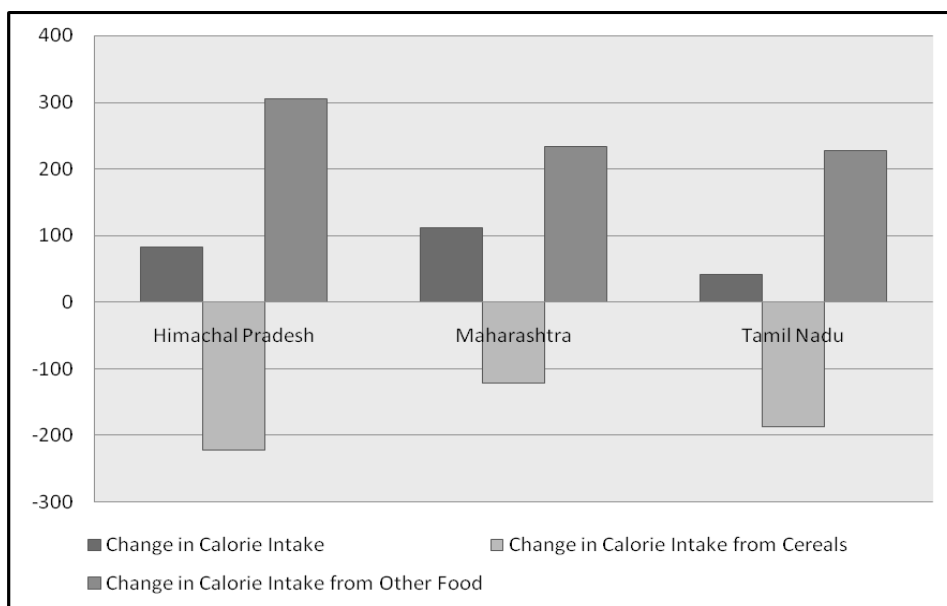
Plotted using author's calculations from NSSO 50th and 66th round

Calorie intake has declined for all the expenditure classes except for the lowest one. The extent of decline is higher for higher expenditure classes. On an average an individual's per day energy intake has been reduced by 133kcal in last two decades. The share of calories coming from cereals has declined and share coming from other food groups has increased. But fall in calorie from cereal is quite substantial and the calorie coming from other food groups could not compensate it, hence leading to a significant decline in calorie intake in the reform period.

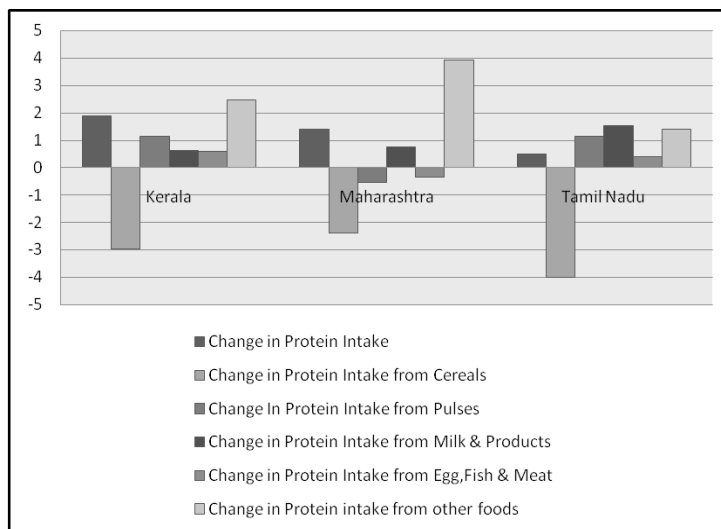
Protein intake also declined in the same time period. The average decline in protein intake is 9.2gram per capita per day. Unlike calorie intake in case of protein intake the extent of fall is higher for lower expenditure classes. In fact the highest spending class that is the top 10 percent population is actually experiencing an increase in protein intake by 23gram. There has been a fall in protein intake from each food group for the 70% population and a rise in protein intake from all groups is observed for the top 10% population. Hence there has been an increase in inequality in the reform period in terms of food consumption and nutritional outcome. Both the diagrams indicated that fall in calorie and protein intake in India are the fall out of steep decline in cereal consumption which has still been the main source of calorie and protein till now.

Same facts can be verified for the individual states as well. Himachal Pradesh, Maharashtra and Tamil Nadu have experienced gain in calorie intake over this time period. There has been a fall in contribution from cereal group but the share coming from other foods has compensated the loss. Improvement in protein intake is observed for Kerala, Maharashtra and Tamil Nadu. Kerala and Tamil Nadu have gone through an increase in protein intake from all the food items but Cereals. Whereas Maharashtra has come across a fall in protein intake coming from cereals, pulses and egg, fish & meat and a rise in protein intake from milk & products and other food groups. These states have undergone a change in consumption pattern accompanied by a nutritional gain.

Figure: 10, Net Gain in Calorie Intake, 1993-94 to 2009-10

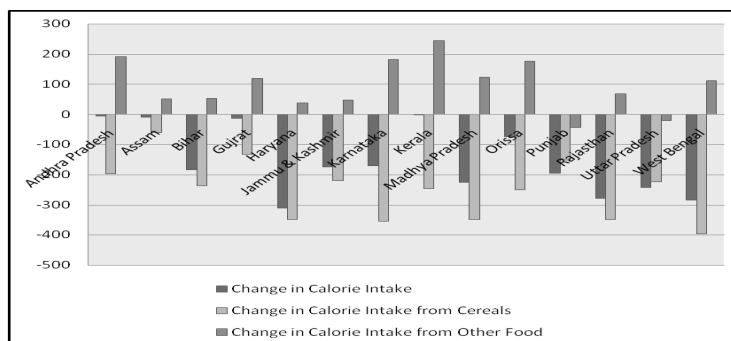


Source: Plotted using author's calculations from NSSO 50th and 66th round

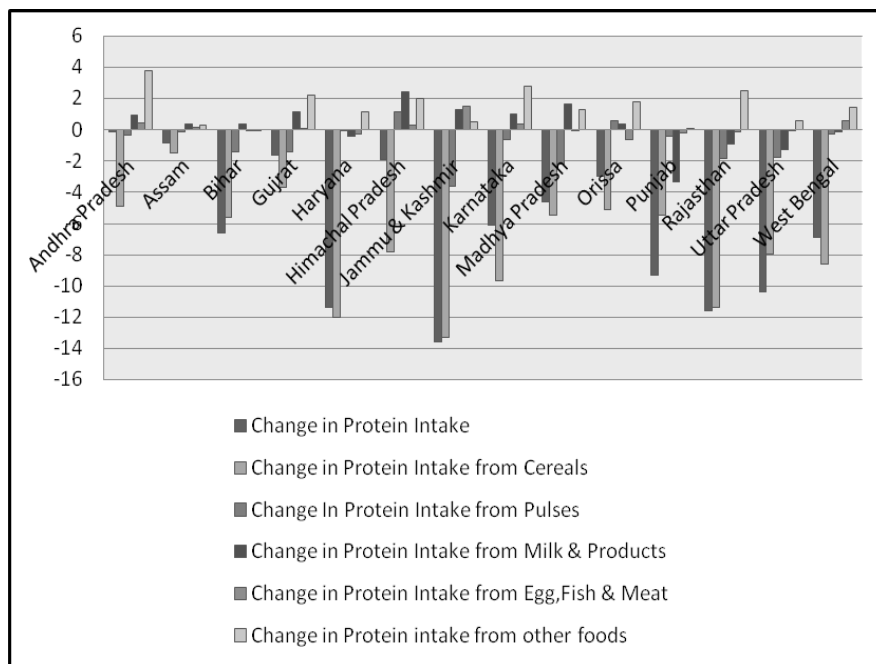
Figure: 11, Net Gain in Protein Intake, 1993-94 to 2009-10

Plotted using author's calculations from NSSO 50th and 66th round

The rest of the states have undergone nutritional loss in the reform period. The drop in calorie intake is highest in Haryana followed by West Bengal, Rajasthan, Uttar Pradesh and Madhya Pradesh respectively. Fall in calorie intake from the cereal group is even higher than their total decline implying that any increase in share of calorie from other food could not compensate the large fall in calorie from cereals. Uttar Pradesh experienced a fall in calorie intake from both the groups. Andhra Pradesh, Assam, Gujarat and Kerala experienced a minor fall in calorie intake implying situation remains almost unchanged in the last two decades. Fall in protein intake is highest for Haryana followed by Jammu & Kashmir, Rajasthan and Uttar Pradesh. Drop in protein intake from the cereal group is very high for all these states. It is clear from the above tables that states experiencing steep fall in cereal consumption have also undergone steep fall in nutritional intake. Insignificant rise in expensive dairy or meat consumption could not compensate the fall in nutritional intake due to drop in cereal intake. Hence this is strengthened that nutritional security actually depends on food security.

Figure: 12, Net Loss in Calorie Intake for States, 1993-94 to 2009-10

Source: Plotted using author's calculations from NSSO 50th and 66th round

Figure:13, Net Loss in Protein Intake for States, 1993-94 to 2009-10

Source: Plotted using author's calculations from NSSO 50th and 66th round

One important finding is that magnitude of decline in calorie and protein intake is found to be higher for the higher spending classes. People belonging to lower spending classes are already at a low level of energy intake. So any increase in real spending is spent on food, while people belonging to rich class can afford to shift spending from food to non food. Increase in incomes lead to different pattern of consumption for different stages of economic growth. Like the whole society for an individual also this trend follows. It has been found in countries at their early stage of development that, people spent most of their limited income on bread and potatoes. Their calorie intake was low at 1900kcal to 2300kcal per capita per day and most of them were malnourished. So any increase in real income led to an increase in consumption of all foods especially starchy staples to moderate hunger. With later increase in income people bought more of expensive food like vegetables, fruits, meat, fish, dairy products etc. That leads to increase in total calorie intake by at least 50%. Surprisingly for India the increase in calorie intake is not taking place rather it is declining consistently. With decrease in real spending, households are forced to consume less to buy non food essentials.

IMPLICATION FOR FOOD SECURITY

The continuous decline in purchasing power owing to deflationary policies of subsidy cut and dismantling of universal PDS has led to decline in foodgrain sales from fair price and ration shops. Studies have shown that a well functioning PDS has helped to reduce poverty in some states. In states like Tamil Nadu, Kerala, Himachal Pradesh and Chhattisgarh impact of PDS on rural poverty is found to be considerable. Although TPDS ended subsidised entitlement for above poverty line households, these states have expanded entitlement over the years. (Khera.et al)

Tamil Nadu provides an additional subsidy on issue prices. Family Cards are issued based on needs and preferences. Under the Antyodaya Anna Yojana, Govt of Tamil Nadu provides 35kg of rice per month to all AAY families. During 11th five year plan Govt has introduced special public distribution system. Under this scheme state Civil Supplies corporations procured essential commodities like pulses, palmolein oil in open market and supplied them at subsidised prices to card holders (Plan document, Tamil Nadu).

Kerala has as well been a story of successful implementation of public distribution system. Expansion in the system of fair price shop came into being in 1964. Kerala rationing order was passed by central govt in 1967 which ensured required food supply for Kerala. Targeted Public Distribution system has affected the state like any other states in several ways. Kerala is a food deficit state and 25 percent of its population was termed as poor by planning commission which is already an under estimation of poverty in 2001 and guaranteed entitlement was ensured for them. State govt has identified 42 percent of population to be poor and has been providing BPL food subsidy to this segment from the state budget. Kerala government has continued to provide additional grain to BPL households as well as maintained its entitlements for APL households by providing subsidy on sales to APL households (Swaminathan., 2002). The policy of giving priority to ensuring food security has shown a positive impact on nutritional outcome of rural Kerala. But inception of targeted public distribution system has forced it to reduce universal PDS coverage and hence led to decline in purchase by at least 2kg per capita per month (of rice) since 1999-00 (RKhera, 2011).

On the contrary, in Bihar, Haryana and Uttar Pradesh where working of PDS is poor, perform poorly in terms of nutritional indicators. This has given rise to an inequality across states. Falling production due to bad monsoon and rising international prices of primary articles have made situation pathetic in the recent years.

Grain (cereals and pulses) provide minimum calorie and protein requirements of human body and ensuring that much through proper implementation of universal PDS to the poor people would have ensured nutritional security of the mass.

Universal PDS was criticised on the ground that well-to-do households also benefited. As government was keen on reducing fiscal and financial cost, such errors of inclusion or type I error was emphasized. The new TPDS actually maximised errors of exclusion by pricing out the poor. The assumption of the policymakers that targeting would help to reduce subsidy bill proved to be wrong, since with high issue price (for APL category) the off take came down and mounting FCI carrying charges kept the volume of fiscal expenses high. The same problem of unsold stocks far above buffer norms, re-emerged during 2002 and 2003 when government itself exported 22 million tons out of stocks. In the most recent period again in 2012-13 and 2013-14 a massive total of 38 lakh tons have been exported according to the Chairman of the Commission on Agricultural Costs and Prices and this has reduced actual availability per capita again within the country to a very low level.

Besides operational issues which led to uneven results across states, there is a conceptual issue which has serious impact on nutritional status of Indian population. (Swaminathan, 2003). The conceptual issue arises because eligibility of BPL status depends on the definition of 'poverty line'. The data shows that the actual percent of population who could not spend enough to obtain 2200 calories per day in rural areas, by 2009-10 had reached 76 per cent (U. Patnaik 2013). Whereas according to official poverty lines the percentages were only 33.8per cent in rural India. A larger section of population is vulnerable in terms of calorie intake, BMI and other health indicator. But they are not entitled to subsidized foodgrain and cannot not afford to pay higher issue price. Consequently, a huge public stock of foodgrains has again built up and while more people are

hungry, India has exported more foodgrains than ever in its entire history. It is clear that targeted PDS has dismantled whatever food security was provided in the previous decades.

CONCLUDING REMARKS

This paper has tried to present a discussion on the prevailing debate on consumption pattern and its impact on nutritional status of Indian population. It is claimed in many studies that trends in declining food grain consumption are the outcome of change in taste and preferences and diversified food basket even for the lower expenditure classes. But this study shows that consumption of expensive food items are too less to make any positive diversification in the food basket. Any improvement in nutritional status is not uniform across states and spending classes. In this study it is also found that states with well functioning PDS (Tamil Nadu, Kerala, Himachal Pradesh) are experiencing improvement in nutritional status. It has been argued by policy makers and many academicians that people are voluntarily shifting away from foodgrains which is the reason behind mounting food stock in FCI go downs. But the deteriorating nutritional status and failing health indicators have been ignored in the optimistic interpretation. Although the well performing states have also experienced a decline in cereal intake, as necessary food items are available on a subsidised rate for a greater section of people, it is easier to diversify their food basket according to taste and preferences which does not affect nutritional status of the population. The 68th quinquennial round data for 2011-12 financial year is in public domain. The current data has shown some optimistic development in terms of grain consumption and nutritional intake owing to rise in real farm and non farm income. All the states have experienced an increase in intake of pulses and pulse products with some of them showing increase in cereal intake as well. There has been an increase in the consumption of milk & product and decline in the meat items. These results intensify the fact that food security can be ensured by putting right amount of basic food grains in the basket.

PDS has a great impact on poverty. The states where PDS reforms are long overdue have performed badly in terms of important nutritional and health indicators. The immediate and vital measure is to discard TPDS included in the new form of the Food Security Act, and amend its provisions to return to the earlier universal system. Ration card should be provided to every household and individual who applies for it and there should be a single issue price at the subsidized rate. Long term policies of reviving employment and hence purchasing power also need to be initiated on an urgent basis.

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NOTES

1. Though there is difference between fish caught at sea opposed to fish raised in ponds and fed with meals, as this break up is not available, resulting overestimation of indirect intake is not taken into account.

APPENDIX
Table: A2 Per capita Monthly Consumption of Different Food Items in the States, Rural India

| | Cereals and Cereal Substitutes | | Pulses and Pulse Products | | Milk and Milk Products | | Egg | | Fish & Meat | | Edible Oil | | Sugar | | Vegetables | | Fruits | |
|------------------|--------------------------------|---------|---------------------------|---------|------------------------|---------|---------|---------|-------------|---------|------------|---------|---------|---------|------------|---------|---------|---------|
| | 1993-94 | 2009-10 | 1993-94 | 2009-10 | 1993-94 | 2009-10 | 1993-94 | 2009-10 | 1993-94 | 2009-10 | 1993-94 | 2009-10 | 1993-94 | 2009-10 | 1993-94 | 2009-10 | 1993-94 | 2009-10 |
| [1] | [2] | [3] | [4] | [5] | [6] | [7] | [8] | [9] | [10] | [11] | [12] | [13] | [14] | [15] | [16] | [17] | [18] | [19] |
| Andhra Pradesh | 13.28 | 11.56 | 0.7 | 0.67 | 2.84 | 3.34 | 1.44 | 2.04 | 0.33 | 0.38 | 0.4 | 0.68 | 0.51 | 0.49 | 3.31 | 4.24 | 0.18 | 0.13 |
| Assam | 13.2 | 12.64 | 0.51 | 0.51 | 1.25 | 1.54 | 1.13 | 1.96 | 0.61 | 0.67 | 0.3 | 0.49 | 0.47 | 0.47 | 5.61 | 5.15 | 0.12 | 0.15 |
| Bihar | 14.31 | 12.25 | 0.72 | 0.58 | 2.43 | 2.69 | 0.14 | 0.43 | 0.2 | 0.19 | 0.3 | 0.49 | 0.38 | 0.33 | 6.21 | 5.67 | 0.11 | 0.18 |
| Gujarat | 10.58 | 9.47 | 0.88 | 0.7 | 4.96 | 6.04 | 0.22 | 0.25 | 0.1 | 0.09 | 0.64 | 0.96 | 1.21 | 1 | 4.3 | 4.42 | 0.16 | 0.33 |
| Haryana | 12.91 | 9.87 | 0.62 | 0.64 | 13.97 | 13.6 | 0.08 | 0.14 | 0.07 | 0.03 | 0.27 | 0.61 | 1.86 | 1.45 | 4.36 | 4.73 | 0.31 | 0.37 |
| Himachal Pradesh | 13.37 | 11.42 | 1.07 | 1.27 | 7.57 | 9.26 | 0.22 | 0.58 | 0.09 | 0.12 | 0.45 | 0.79 | 1.01 | 1.16 | 3.58 | 4.27 | 0.3 | 0.25 |
| Jammu & Kashmir | 14.84 | 12.96 | 1.13 | 0.67 | 7.3 | 8.17 | 0.63 | 1.35 | 0.09 | 0.27 | 0.49 | 0.78 | 0.92 | 0.69 | 3.87 | 4.8 | 0.32 | 0.36 |
| Karnataka | 13.15 | 10.04 | 0.79 | 0.72 | 2.92 | 3.67 | 0.89 | 1.36 | 0.28 | 0.33 | 0.29 | 0.61 | 0.9 | 0.72 | 3.19 | 2.99 | 0.97 | 0.09 |
| Kerala | 11.73 | 9.44 | 0.43 | 0.59 | 2.65 | 3.05 | 1.99 | 2.26 | 1.59 | 2.02 | 0.3 | 0.53 | 0.87 | 0.85 | 2.8 | 3.06 | 0.37 | 0.24 |
| Madhya Pradesh | 14.22 | 11.23 | 0.97 | 0.72 | 2.81 | 4.04 | 0.15 | 0.36 | 0.13 | 0.13 | 0.37 | 0.66 | 0.73 | 0.78 | 4.03 | 3.34 | 0.24 | 0.17 |
| Maharashtra | 11.47 | 10.5 | 0.93 | 0.87 | 2.52 | 3.09 | 0.61 | 0.8 | 0.22 | 0.22 | 0.47 | 0.9 | 1.09 | 1.01 | 2.94 | 3.13 | 0.22 | 0.18 |
| Orissa | 15.94 | 13.75 | 0.45 | 0.54 | 0.78 | 1.03 | 0.29 | 0.76 | 0.36 | 0.33 | 0.22 | 0.48 | 0.36 | 0.42 | 5.43 | 5.33 | 0.18 | 0.2 |
| Punjab | 10.78 | 9.44 | 0.88 | 0.86 | 14.36 | 11.88 | 0.47 | 0.42 | 0.06 | 0.04 | 0.5 | 0.81 | 2.03 | 1.74 | 5.41 | 5.01 | 0.28 | 0.24 |
| Rajasthan | 14.84 | 11.71 | 0.64 | 0.41 | 10.52 | 9.8 | 0.07 | 0.08 | 0.06 | 0.04 | 0.35 | 0.59 | 1.18 | 1.03 | 3.19 | 2.98 | 0.13 | 0.17 |
| Tamil Nadu | 11.73 | 10.07 | 0.68 | 0.85 | 2.15 | 3.26 | 1.06 | 1.96 | 0.34 | 0.39 | 0.33 | 0.6 | 0.49 | 0.6 | 3.45 | 3.26 | 0.11 | 0.08 |
| Uttar Pradesh | 13.91 | 11.94 | 0.98 | 0.78 | 5.47 | 4.51 | 0.21 | 0.34 | 0.16 | 0.14 | 0.39 | 0.58 | 0.92 | 0.72 | 3.79 | 5.17 | 0.36 | 0.17 |
| West Bengal | 14.97 | 11.49 | 0.42 | 0.4 | 1.55 | 1.44 | 1.69 | 2.57 | 0.68 | 0.76 | 0.35 | 0.591 | 0.43 | 0.43 | 7.24 | 6.31 | 0.16 | 0.17 |
| India | 13.46 | 11.38 | 0.76 | 0.66 | 4.01 | 4.1 | 0.64 | 0.95 | 0.31 | 0.32 | 0.37 | 0.56 | 0.79 | 0.7 | 4.75 | 4.52 | 0.21 | 0.18 |

Source: Calculated by author from NSSO Unit level Data on Consumer Expenditure from 50th and 66th rounds

Table: A3, Direct, Indirect & Total Demand for Foodgrain in Rural India

| | | Direct Grain | | | Indirect Grain | | | Total Grain | |
|----------------|---------|--------------|---------|---------|----------------|---------|---------|-------------|---------|
| Decile Classes | 1993-94 | 2004-05 | 2009-10 | 1993-94 | 2004-05 | 2009-10 | 1993-94 | 2004-05 | 2009-10 |
| [1] | [2] | [3] | [4] | [5] | [6] | [7] | [8] | [9] | [10] |
| 1 | 10.99 | 10.83 | 10.58 | 0.20 | 0.24 | 0.28 | 11.19 | 11.07 | 10.86 |
| 2 | 12.6 | 11.85 | 11.16 | 0.35 | 0.39 | 0.42 | 12.95 | 12.24 | 11.59 |
| 3 | 13.27 | 12.30 | 11.62 | 0.47 | 0.50 | 0.56 | 13.74 | 12.80 | 12.18 |
| 4 | 13.88 | 12.63 | 11.70 | 0.58 | 0.62 | 0.68 | 14.46 | 13.25 | 12.39 |
| 5 | 14.09 | 12.86 | 12.11 | 0.69 | 0.73 | 0.77 | 14.78 | 13.59 | 12.88 |
| 6 | 14.52 | 13.09 | 12.09 | 0.83 | 0.87 | 0.90 | 15.35 | 13.96 | 12.99 |
| 7 | 14.96 | 13.39 | 12.44 | 0.97 | 1.03 | 1.05 | 15.93 | 14.41 | 13.49 |
| 8 | 15.34 | 13.61 | 12.55 | 1.17 | 1.24 | 1.21 | 16.51 | 14.85 | 13.76 |
| 9 | 15.67 | 13.68 | 12.94 | 1.51 | 1.57 | 1.45 | 17.18 | 15.25 | 14.39 |
| 10 | 16.75 | 14.40 | 13.19 | 2.15 | 2.27 | 2.13 | 18.90 | 16.67 | 15.32 |
| All | 14.22 | 12.86 | 12.04 | 0.90 | 0.95 | 0.94 | 15.12 | 13.81 | 12.98 |

Source: Derived from Table: A1 applying appropriate feed coefficients

Table: A4, Direct and Indirect and Total Demand for Foodgrain in Individual States, in Rural India

| | | Direct Grain | | | Indirect Grain | | | Total Grain | |
|------------------|---------|--------------|---------|---------|----------------|---------|---------|-------------|---------|
| States | 1993-94 | 2004-05 | 2009-10 | 1993-94 | 2004-05 | 2009-10 | 1993-94 | 2004-05 | 2009-10 |
| [1] | [2] | [3] | [4] | [5] | [6] | [7] | [8] | [9] | [10] |
| Andhra Pradesh | 13.98 | 12.74 | 12.22 | 0.84 | 0.91 | 1.00 | 14.82 | 13.65 | 13.22 |
| Assam | 13.71 | 13.67 | 13.15 | 0.96 | 1.46 | 1.13 | 14.67 | 15.12 | 14.28 |
| Bihar | 15.03 | 13.88 | 12.83 | 0.54 | 0.62 | 0.58 | 15.57 | 14.50 | 13.41 |
| Gujarat | 11.46 | 10.85 | 10.17 | 0.73 | 0.76 | 0.85 | 12.19 | 11.61 | 11.02 |
| Haryana | 13.53 | 11.25 | 10.51 | 1.77 | 1.71 | 1.68 | 15.30 | 12.95 | 12.19 |
| Himachal Pradesh | 14.44 | 13.25 | 12.69 | 1.03 | 1.19 | 1.30 | 15.47 | 14.44 | 13.98 |
| Jammu & Kashmir | 15.97 | 13.86 | 13.63 | 1.03 | 1.58 | 1.40 | 17.00 | 15.44 | 15.03 |
| Karnataka | 13.94 | 11.50 | 10.76 | 0.75 | 0.83 | 0.93 | 14.69 | 12.33 | 11.69 |
| Kerala | 12.16 | 11.01 | 10.03 | 2.37 | 3.19 | 2.94 | 14.53 | 14.20 | 12.97 |
| Madhya Pradesh | 15.19 | 12.54 | 11.95 | 0.50 | 0.53 | 0.66 | 15.69 | 13.07 | 12.61 |
| Maharashtra | 12.4 | 11.47 | 11.36 | 0.61 | 0.70 | 0.69 | 13.01 | 12.17 | 12.05 |
| Orissa | 16.39 | 14.48 | 14.29 | 0.55 | 0.57 | 0.57 | 16.94 | 15.04 | 14.86 |
| Punjab | 11.66 | 10.76 | 10.30 | 1.83 | 1.46 | 1.50 | 13.49 | 12.22 | 11.80 |
| Rajasthan | 15.48 | 13.19 | 12.13 | 1.34 | 1.21 | 1.23 | 16.82 | 14.40 | 13.36 |
| Tamil Nadu | 12.41 | 11.67 | 10.92 | 0.74 | 0.80 | 0.99 | 13.15 | 12.46 | 11.91 |
| Uttar Pradesh | 14.89 | 13.77 | 12.72 | 0.86 | 0.76 | 0.74 | 15.75 | 14.53 | 13.46 |
| West Bengal | 15.39 | 13.60 | 11.89 | 1.12 | 1.38 | 1.26 | 16.51 | 14.98 | 13.15 |
| India | 14.22 | 12.86 | 12.04 | 0.90 | 0.95 | 0.94 | 15.12 | 13.81 | 12.98 |

Source: derived from Table: A2 applying appropriate feed coefficient

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