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Rapporteur's Report on Trends in Food Consumption and Nutrition - Food Security Concerns

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Food security has remained the central concern of India's development policy and planning since the beginning of era of planned development. The international development community and institutions have also been seriously concerned with food and nutrition security, particularly for developing countries and underprivileged sections of the society. Consequently, lot of progress has been made in terms of increase in food supply, improvement in purchasing power, distribution of food at subsidised rate and reduction in poverty. Though, these and other related efforts have helped in reducing intensity, severity and magnitude of food and nutrition insecurity, still a large segment of population continues to be deprived of adequate food and nutrition. This is the main reason that the issue of food and nutrition security continues to attract attention of academia, policy makers, civil society and political class. It was in this backdrop that Indian Society of Agricultural Economics selected the topic on Food and Nutrition Security as one of the three subjects for its 66th Annual Conference.

Keeping in view the questions raised in the theme outline, a large number of researchers contributed papers on the subject. In total 50 papers have been accepted for discussion during the Conference. The papers cover diverse aspects of food security which are grouped as follows:

- (a) Food availability as indicated by trends in domestic production at national and regional (state) level,
- (b) Changes in consumption pattern as revealed by expenditure share and food intake,
- (c) Calorie intake as indicator of food security and nutrition,
- (d) Dietary diversification and nutrition,
- (e) Relationship between income and nutrition,
- (f) Government policies and programmes for improving food security and nutrition,
- (g) India's experience in the global context.

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Most of the paper-writers have used NSSO data on consumer expenditure available for various rounds at national and state level and in some cases even at the district level. Official statistics on food production and availability, derived after making allowances for feed, seed, wastage and industrial use, have been used as the second most important source of data. There are quite a few papers based on primary data and field surveys carried by individual researchers at various locations.

FOOD AVAILABILITY AS INDICATED BY TRENDS IN DOMESTIC PRODUCTION

At the time of Independence from colonial rule India faced serious strain on food front with heavy dependence on imports. The problem became very severe by mid 1960s when India faced consecutive droughts for two years during 1965-66 and 1966-67. The country then adopted new agricultural strategy and decided to spread cultivation of high-yielding varieties of wheat and paddy, which subsequently translated into green revolution. The main concern on the food front was to overcome food scarcity by increasing availability of food at the national level. Political consensus was that household food security cannot be addressed without attaining food self-sufficiency at national level. It was also implicit in this strategy that self-sufficiency in food at the national level would result in household food security. Accordingly, paper-writers under this sub-theme have looked at the growth rate in total and per capita production of various food commodities as an indicator of food security. The papers by D.S. Navadkar *et al.*, Brahm Prakash *et al.*, Arjinder Kaur and Kiren Sethi and V.R. Kiresur *et al.* have used availability of food, as derived from production, as an indicator of improvement/deterioration in food and nutrition security. The availability of different food items was found lower than required dietary allowances, except in the case of fruits, by Kiresur *et al.* and Brahm Parkash *et al.* Similarly, Gajendra Singh and T. S. Bhogal observed that except Punjab, Haryana, Himachal Pradesh, and Uttar Pradesh other states are deficit in cereals. In another paper based on field study in Karimnagar district in Andhra Pradesh M. Srikanth Reddy and N. Vasudev observe that even though production in the sample villages was relatively lower, the consumption levels were higher than the required level. Among other papers on this topic, S. S. Wadkar *et al.* report on trends in net availability of cereals and pulses, K.K. Shrivastava *et al.* report per capita food availability in terms of index, Sant Ram *et al.* and K. Suhasini *et al.* make demand projections towards 2010 and 2025 respectively. The latter also reports, based on disposal pattern of foodgrains, that farm household retain only 7.49 per cent of foodgrains for self consumption, 0.75 per cent for seed and 0.5 per cent for feed which appear to be awfully low.

Net availability of food was also examined at the state level and compared with the requirement. Among the three papers on Himachal Pradesh, M. S. Pathania and G. D. Vashist found the state to be highly surplus in foodgrains, whereas K.D. Sharma *et al.* report foodgrain deficiency to the extent of 16 per cent. S.P. Saraswat *et al.* report mixed results for various cereals. These papers looked at the net availability

without accounting for trade in grains and other foods – produce entering into the state and going out of the state. In a paper on Orissa, R.K. Panda observes that food security was deteriorating in the state and the already existing low intake of food worsened further due to negative growth rate in rice, other cereals and pulses after 1990-91. Negative growth rates are also reported for cereal production in Madhya Pradesh by A.K. Verma. The paper by K.K. Datta *et al.* projects shortage in foodgrain production to meet the requirement in future in all north-east states except Assam. D.K. Grover and Parminder Singh estimated post-harvest losses in wheat and mungbean in Punjab and assert that food insecurity can be partially tackled by reducing harvest and post harvest losses. K.A. Varghese *et al.* examined food security situation in various states by looking at the growth rate in foodgrains, population and inter-year variation in foodgrain production. The paper constructs food security indices for each state using foodgrain production, availability, and variability and poverty as the variable. This index was found lowest for Orissa and highest for Punjab. Among the 28 states of the country, West Bengal ranked third in food security index.

These papers throw useful light on the status of national/regional food security. All the papers that examined national level net availability of food relied solely on official statistics which derives the net availability of food from production, as follows:

$$\text{Net Availability} = \text{Total production} + \text{Import} - \text{Export} \pm \text{Change in stock} - (\text{wastage and other uses like seed, feed and industrial use}).$$

The official statistics estimate the net availability of foodgrains at 87.5 per cent of gross production in respect of cereals and pulses. The percentage used in respect of rice, wheat and gram are 92.4, 87.9 and 77.9 per cent. Since 1950-51, the proportion of foodgrains used for seed, feed, industrial use and wastage has been taken at uniform level of 12.5 per cent of gross production. It is generally believed that over time demand for livestock feed has risen rapidly, and on account of this, the proportion of foodgrain available for food is likely to go down. Thus, foodgrain availability and the estimate of nutrition based on these figures presented in various papers are likely to be over-estimates. There is a need to prepare estimates of different food commodities being used as feed and seed, for industrial purpose and wastage for their own sake and also to arrive at credible estimates of net availability of food for direct human consumption. Similarly, net availability derived from production statistics at state level does not have much relevance unless adjustments are made for domestic trade, i.e., flow of commodity coming into and going outside the state.

Another serious problem with assessment of food security from food availability at national level is the aspect of inequality in distribution of consumption across different income classes. Some studies in the literature show decline in consumption

by bottom group of rural population and increase in consumption by the population in top income group.

CHANGES IN CONSUMPTION PATTERN AS REVEALED BY EXPENDITURE
SHARE AND FOOD INTAKE

Papers under this topic have mainly used NSSO data and examined the changes in share of food and non-food commodities in total household expenditure, growth in food expenditure, trend in quantity consumed of various products. There is a considerable focus on the changing pattern of cereal consumption and its implications for nutrition. Considerable overlaps were found in the coverage of a large number of papers.

Ramesh Golait and N.C. Pradhan succinctly describe the changes in consumption pattern in India between 1987-88 and 2001-02; marked decline in the consumption of cereals with the reduction being particularly sharp in coarse cereals in nearly all states, and switch in preference towards livestock and horticultural products. The paper concludes that whatever the underlying factors causing these changes, there is significant decline in calorie consumption. Another important observation made in this paper is that malnutrition exists in some families that are not poor due to lack of knowledge about proper food and its attributes. The authors conclude that problem of undernutrition cannot be addressed simply by increase in food production. According to them, long run solution to undernutrition is to ensure employment opportunities for all citizens so that they acquire purchasing power to meet their nutritional requirement.

Paper by A.K. Giri provides more updated account of cereal consumption extending upto 60th Round, which covers the period January to June 2004, for all major states of India. The consumption pattern of cereals is also compared across expenditure classes. There is a decline in per capita cereal intake over time in all the states, however, cross section data for the 60th Round shows increase in cereal intake with increase in expenditure upto top expenditure class in rural areas. In urban areas, out of 12 expenditure classes, cereal consumption increased upto sixth expenditure group and declined thereafter. However, per capita intake of cereals in top two expenditure classes was much higher than two expenditure classes at the bottom. The paper highlights that 5 per cent of the population each in rural and urban areas does not consume enough cereals to get 50 per cent of total calorie required as per the norm. A similar paper on Uttar Pradesh by R.B. Singh *et al.* shows 11.4 and 5.7 per cent decline in per capita total cereal intake whereas more than 18 per cent increase in intake of rice between 1999 and 2003. The increase is substantial in the case of edible oils vegetables, fruits, milk and meat, fish and eggs.

P. Nasurudeen *et al.* look at long term changes in consumption of cereals and non-cereal food spread over 1972-73 to 1999-2000. Some interesting findings from this paper are: decline in share of cereals in total household expenditure from close to half of what it was during 1972-73; expenditure on non-cereals food increased

faster than total household expenditure in rural areas; most of this increase was due to increase in expenditure on vegetables. Paper by R.K. Singh *et al.* confirms continuation of this trend towards 2003. As noted by some other papers increase in spending on non-cereal food did not improve energy and protein intake in rural areas. The paper highlights that despite a decline in consumption of cereals they meet two-third of total energy and protein demand in rural areas and more than 55 per cent in urban areas. Inequality in calorie intake across income classes showed marked decline till 1993-94 but remained at almost same level afterwards. Across states, calorie intake followed substantial decline in economically better off states of Punjab and Haryana which witnessed sharp reduction in per capita cereals consumption in the same period (Giri). The share of energy derived from cereals is found to be less than 50 per cent in the case of rural households in Haryana (U.K. Pandey *et al.*). Surprisingly, this paper reports decline in per capita milk consumption to below 200 grams/day during 1999-2000 as compared to 484 grams during 1977-78, which is not supported by data reported in NSSO reports.

In the case of Orissa, notwithstanding reduction in percentage expenditure on cereals as reported by H.N. Atibudhi for the whole state, per capita consumption of cereals, in particular rice, is reported to witness increase in very poor household (Parshuram Samal), based on this Samal indicate that disaggregation by commodity and income class is essential while designing food programme. The paper estimates that price effect on demand was very high in the case of poor and it declines with increase in income. The paper suggests subsidy on cheaper and inferior varieties of rice, which is widely consumed by the poor, for better targeting and for reducing subsidy burden.

A.K. Gauraha used primary data at two points of time namely, 1986-87 and 1996-97, from a village in Raipur district of Chhattisgarh to study the changes in consumption expenditure and other socio economic characteristics. The paper observes that quantity of food consumed was below the recommended level in almost all the food items except cereals.

DIETARY DIVERSIFICATION, CALORIE INTAKE, AND FOOD SECURITY AND NUTRITION

There is almost unanimity among various paper writers about changes in dietary pattern resulting into dietary diversification in favour of horticultural and livestock products in both rural as well as urban areas. However, there is no consensus about implications of dietary diversification on calorie intake, food security and nutrition. P. Nasurudeen *et al.* consider increase in consumption of vegetables, fruits, and livestock products and associated decline in calorie as improvement in the nutritional standard and qualitative improvement in diet. Based on this they favour policy to accelerate production of non-cereal food items. At the same time it is well recognised that dietary diversification would not help in improvement in nutrition if the purchasing power of poorer and weaker sections of the society does not increase

substantially. For these sections of society dietary diversification that involves reduction in cereal consumption and a small increase in non-cereal foods generally leads to deterioration in nutrition because cereals happen to be the cheapest source of energy, and even protein, both of which are vital for health. Paper by R.K. Singh *et al.* reports that after 1993-94 there was a small increase in the incidence of chronic hunger but decline in seasonal hunger.

Brahm Prakash *et al.* examines several aspects of food consumption and nutrition and provides valuable information on statewise average calorie intake, calorie intake by lowest decile, proportion of population below threshold energy intake, protein deficiency, poverty and health status. The paper concludes that declining per capita cereal consumption and calorie intake on the whole do not imply deterioration in food security; nevertheless, the paper emphasises need to promote cereal consumption of poor sections.

Paper by Jabir Ali analysed changes in consumption pattern of livestock products using data from three quinquennium rounds of NSSO, namely, 1987-88, 1993-94 and 1999-2000, and also the examined changes in intake of various nutrients during 1993-94 and 1999-2000. The changes in consumption pattern are less pronounced and sometime indicate opposite directions when these changes are compared between successive rounds. The reason for this seems to be that changes in the short run are sometimes dominated by the situation prevailing in the particular year. Therefore, to understand structural changes in consumption pattern, it is desirable to look at the changes over a somewhat longer period of time rather than drawing strong inferences from changes between two points of time with a gap of 5 to 6 years. The results presented in this paper also show that due to very low consumption of livestock products in base period even high growth in their intake did not improve nutrition of rural households. Another important result presented in the paper for a cross section data for the year 1999-2000 is that higher the income, represented by expenditure class, more is calorie intake, protein intake and fat intake.

At the regional level, Ashok Kumar investigated state wise changes in the dietary pattern and intake of energy, protein, fat, calcium, iron and vitamins and other nutrients in different states in North East Hill Region. He also estimated price and income elasticities and impact of various socio economic factors on demand for dietary energy. The purchasing capacity and price are found to be significant factors in determining nutrition level in all the states. In majority of the north-eastern states average per capita calorie intake was found below 2100 Kcal but no state was found deficient in the intake of most of the vitamins.

Some papers looked at the dietary pattern and nutrition by grouping population in different socio-economic groups other than expenditure classes of NSSO. Veena Kumari and R.K.P. Singh compared the consumption pattern and nutrition among scheduled caste, landless, and marginal land owners and according to the education status of head of the household in North Bihar. All categories consumed much higher cereals and roots and tubers whereas consumption of all other foods was far lower as

compared to the recommended dietary allowance. The deficiency was comparatively very high among landless and illiterate households and female members. This was the only paper which also looked at anthropometric measures to detect health status of male and female children. In Chhattisgarh per capita cereal consumption was found to decrease with the increase in the size of land holdings whereas consumption of all other foods increased with size of land holding (R. Bhakar *et al.*). In contrast to the findings of several other papers based on NSSO data, paper by Bhakar *et al.* indicate improvement in energy and protein with increase in dietary diversification that involved less cereals and more non cereal food. This paper, and paper by M.N. Waghmare *et al.* based on field level data in Maharashtra, emphasise promotion of dairy industry to improve the nutrition of rural population. Paper by Govind Pal *et al.* based on a study of lac growers in Jharkhand favours diversification of agriculture to improve income and production of variety of food.

P.S. Rao and D.C. Pant bring into focus quality factor while analysing item wise expenditure and consumption among high, middle and low income groups in Udaipur district in Rajasthan. The paper found that the three groups spend Rs. 625, Rs. 425 and Rs.270 per capita per month on cereals respectively. But people in lower income group consume poor quality and low priced BPL cereals. Due to this variation, lower income households are reported to consume 23 per cent more cereals than higher income group and 13 per cent more than middle income group and accordingly derive much higher energy for a much lower expenditure. These findings have serious implications – as the price variation for cereals consumed by the three groups is found to be quite large, in the ratio of 2.88:1.77:1.00. If this holds true then use of expenditure to study food and energy intake becomes not only redundant but misleading. Some more surprising results are presented in a paper by V. Banumathy and K.R. Sundarvardarajan based on sample survey in Cuddalore district in Tamil Nadu. In two groups of sample the group with higher total household expenditure spent much less on cereals in both rural and urban areas. In rural sample the group with higher total expenditure also spent less on total food. There is a paper by P.C. Ravi *et al.* on poverty and food insecurity among Jenukurba tribals in Mysore district of Karnataka. These tribal households draw about 40 per cent of their income each from wage earnings and non timber forest products, and they meet 50 per cent of their nutritional requirement from forest products.

Paper by R.K. Khatkar and V.K. Singh compared the consumption pattern on irrigated and unirrigated farms in arid areas of Haryana and Rajasthan. It concluded that level of production on own farm and level of household income influenced consumption pattern. In a paper on food security in Pondicherry the authors Vinodhini P. and A. Pouchepparadjou identified low price for farm products as a reason for food insufficiency at farm households and high price as the reason for food insufficiency at non-farm households. This underscores the need to balance producers' and consumers' interest in farm price policies.

RELATIONSHIP BETWEEN INCOME AND NUTRITION

The relationship between increase in income and nutrition in India is not consistent. Cross section data for various expenditure classes, which is taken to represent income classes, show increase in intake of calorie, protein and other nutrients with the increase in income. This relationship is quite robust in rural as well as urban areas. However, increase in per capita income over time, which also benefited bottom income group as revealed by reduction in proportion of population under poverty, did not show a positive impact on calorie and protein intake. This creates a sort of puzzle as to why households in general did not increase calorie and protein intake when their income increased. This puzzle has one more dimension. Even at higher income level, where there is no economic constraint to consume more food, calorie and protein intake is not adequate, in some cases, as per the prescribed norm. Thus, in all India sample of NSSO, in the case of upper income group, 9 per cent population is reported to suffer from calorie deficiency and 14 per cent suffers from protein deficiency during 1999-2000.

The paper by G.S. Randhawa and S.S. Chahal on Punjab compared the consumption of various food items with particular focus on milk in developed and underdeveloped region. It was observed that expenditure on milk and milk products as well as cereals was higher in developed region. Expenditure elasticity of milk consumption was found around 0.8 which was close to elasticity for fruits but much higher than that for cereals. Paper by L.D. Hatai *et al.* found increase in expenditure on all food items including cereals with the increase in farm size, which involved increase in income, in Varanasi district of Uttar Pradesh. The average calorie intake at marginal holding is reported to be 2574 Kcal/capita /day which increased to 3087 at large size holdings.

P.G. Chengappa *et al.* compared the consumption pattern of farmers following different farming systems and then examined the impact of farming system on nutrition adequacy in Bangalore district of Karnataka. It seems different farming systems are taken to indicate the impact of income variation and domestic availability of products produced by household across farming systems. Household income increased substantially with addition of livestock, sericulture and vegetables to crop system; however, the impact of this increase in income is not seen in per capita food expenditure. Another surprising result of this paper is that landless labour consumed more vegetables than vegetable growers and all other categories of farmers. Also, consumption basket of landless labour is reported to be having higher share of high value food crops as compared to most of the farming household categories. Despite landless labour consuming higher quantity of most of the food compared to crops and crop plus livestock farms, they are reported to have highest nutritional deficiency, which looks contradictory. M. Thilagavathi and M. Chandrasekran in their paper based on field study in Tamil Nadu found negative impact of soil quality degradation on food consumption, presumably through effect on income. Paper by K.N. Selvaraj and C. Ramasamy highlights the risk to food consumption and nutrition due to

drought which struck almost once in 6 years in Tamil Nadu during last 35 years. Self production of rice in rainfed environment in the drought period declines by one-third which reduces consumption and increases dependence on purchased food. The paper calls for technology and policy response to address food insecurity and poverty due to droughts in rainfed areas.

GOVERNMENT POLICIES AND PROGRAMMES FOR IMPROVING FOOD
SECURITY AND NUTRITION

Government policies and programmes are playing a vital role in food security and nutrition of large population of India. Papers have been submitted on public distribution system and various government programmes like ICDS, mid day meal programme etc. for improving nutrition of children and vulnerable sections of society. According to Ramesh Golait and N.C. Pradhan the system of dual pricing under PDS encourages leakage and they favour uniform price policy with food coupons for BPL families. G.V. Krishna Rao and K.R. Chowdary feels PDS is ill conceived, badly implemented and suffers from several problems. To overcome these they suggest alternative to PDS in terms of a novel approach as practiced by Deccan Development Society in Andhra Pradesh. This involves increased production of jowar, millets and pulses in dryland agriculture and putting fallow lands to efficient utilisation through involvement of local people. The approach uses local production, local storage and local distribution at a cheap rate to the poorest families. Another paper on PDS is by Mukesh Kumar Singh and Anita Tyagi. This paper underlines the importance of PDS for food security and suggests that reach of PDS depends upon foodgrain procured by government. The paper makes a large number of suggestions to make PDS effective for food security. K.K. Datta *et al.* articulate the need to make PDS more effective in North East Hill Region. They observe that local production was falling short to meet the requirement and, as the purchase of foodgrain at market price is beyond the purchasing power of large population, there is heavy reliance on distribution of subsidised grains. The paper feels concerned that despite large foodgrain deficiencies the PDS system in the region did not make full use of allocations.

Paper by Rajashree Padhi discusses the achievements of ICDS and mid-day meal programme in each state of India. The paper also provides estimates of annual productivity loss due to nutritional deficiencies under different scenarios. The main message from this paper is that efforts to improve child nutrition would not be successful without participation of community. In a descriptive paper Pradeep D. Hadke and Surendra R. Jichkar discuss economic approaches to food security and policy options and challenges related to improvement in nutrition.

INDIA'S EXPERIENCE IN GLOBAL CONTEXT

Paper by R.L. Shiyani and F.A. Shaheen, after examining the trends in poverty, economic growth and undernutrition among selected countries and major country groupings, concluded that food security is not a problem of increasing production but it is a problem of improving access and effective demand of the poorest sections of society. A comparison of per capita intake of different foods between 1970 and 2003 prepared by D. Bardhan *et al.* shows that achievement of India was far below the developing countries in meat, vegetables, fruits and eggs which has worsened already existing large gap. The paper also observes rapid transformation in food consumption towards livestock food products in developing countries which has reduced the gap in dietary diversification and intake between developed and developing countries. Due to dominance of vegetarian diet in India, nutrition intake from livestock products is quite low as compared to other countries. What causes concern is that over time the gap in respect of calorie and protein derived from livestock product in India and Asia and developing countries, as shown in the paper by Jabir Ali, has been widening.

RESEARCH GAP

Most of the papers have presented trend in food consumption and only a few have examined trend in nutrition. The factors underlying trends in consumption of different foods have not been examined empirically in depth. Though paper writers presented wealth of information on changes in intake of food, it is difficult to find conclusive and concrete evidence about improvement/deterioration in nutritional and food security status over time and causes thereof. No paper has looked into the causes and explanation for low level of nutrition in economically better off households. There is also no clarity about changes in food consumption pattern due to supply side factors and demand side factors. For instance, one would not ordinarily expect Indian consumers to cut down on consumption of pulses when there is improvement in income. However, due to supply side constraints per capita consumption of pulses in India has seen a sharp decline. Such changes in consumption pattern are not by preference or choice though they are generally construed as demand driven changes. No paper uses anthropometric measures to examine improvement in nutrition. No serious assessment of government policies and programmes aimed at improving food and nutrition security and providing food safety net is presented in any of the papers.

ISSUES FOR DISCUSSION

- Net availability of foodgrains at macro level, often used to assess food security, is taken as 87.5 per cent of domestic production, plus/minus change in stock and net trade. Since 1950-51, proportion of foodgrains used for feed, seed, and industrial purpose and wastage has been taken as (fixed) 12.5 per

cent of domestic production. How for this is correct, and what is the credibility of data on net food availability based on such assumptions?

- What would be the food availability if appropriate allowance is made for food crops production used as feed?
- Are estimates of food consumption provided by NSSO over different rounds strictly comparable? Is there a need to adjust 1999-2000 estimates downward as pointed out by some researchers?
- Does production of food at household level matters for consumption? If yes, how and for what types of households?
- Are the norms for calorie intake appropriate? What should be the norm for persons living sedentary life style? Is there a need to adjust these norms with change in proportion of population leading sedentary lifestyle?
- Why economically better off household having adequate purchasing power show under nutrition in the form of calorie intake? What explains lower intake of energy and protein in top income classes in India compared to average calorie intake in developed and a large number of developing countries? Do cultural factors and dietary history explain low intake of calories in India?
- Cross section data till 1999-2000 round show increase in per capita cereal intake with increase in income whereas per capita cereal consumption over time show decline despite increase in per capita income. This change in dietary pattern towards livestock and horticultural crops over time is often attributed to increase in income. There is a contradiction between what is observed from cross section and time series data. How to explain the cereal and calorie intake puzzle revealed by cross section data and time series data?
- Dietary diversification involving decline in cereal intake and increase in high value foods is observed to have reduced calorie and protein intake. Does it imply improvement or deterioration in nutrition and food security?
- What quantitative indicators best reflect state of food security at national and household level?