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PRESIDENTIAL ADDRESS

Some Reflections on Food Security in India*

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At the outset, I would like to express my deep gratitude to the members of the Indian Society of Agricultural Economics for honouring me with the opportunity to preside over the 59th Annual Conference. When Professor Vaidyanathan telephoned me to convey your decision my initial reaction was to offer an apology, but it was soon overcome with the fear of doing injustice to your affection towards me. In fact my entry to Agricultural Economics area was influenced by circumstances and I am happy about the outcome. I joined the Indian Institute of Management, Ahmedabad in 1963 with a Statistics background, and I was expected to work in the area of management in agriculture. In order to facilitate my work in this area, I decided to join the Agricultural Business Management Programme offered by the Department of Agricultural Economics at the University of California. However, since the Agricultural Business Management was only a Master's level course, I continued in the department for doctoral work in Agricultural Economics. This decision has paid rich academic dividends including two awards from the American Agricultural Economics Association and this honour that you have conferred on me.

While considering various topics for this address I had two main considerations: - the topic should be somewhat related to the subjects for discussion at the Conference and that it should be related to an area where I have done some work. The choice was influenced by the belief that the three subjects for discussion at this Conference can be directly or indirectly linked with the broad theme of food security and that some of my works have been in the areas of public distribution system and food security. I am conscious of the fact that national food security was the topic of the presidential address by Professor Minhas (Minhas, 1976) at the 1976 Conference of the Society and I repeat the topic since the concept of food security and its relevance to the Indian context has substantially changed over these years.

CONCEPT OF FOOD SECURITY

Food security has been a consistent theme raised in specific contexts in a number of world conferences convened by the United Nations in the 1990s. The Conference on Environment and Development, held in Rio de Janeiro in 1992 emphasised the need to ensure food security at all levels, within the framework of sustainable development, as defined in Agenda 21. The Joint FAO/WHO Conference on Nutrition which was held in Rome in 1992 declared that "hunger and malnutrition are unacceptable in a world that has both the knowledge and the resources to end this human catastrophe" and recognised that "access to nutritionally adequate and safe food is a right of each individual". The World Conference on Human Rights (Vienna, 1993) emphasised the need to ensure that everyone enjoyed a right to food. The International Conference on Population and Development (Cairo, 1994) highlighted the linkage between population growth and food production and the need to evolve global measures to satisfy the ever growing food needs. The World Summit on Social Development

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(Copenhagen, 1995) made a strong commitment to the campaign against hunger through its emphasis on poverty eradication. The Fourth World Conference on Women (Beijing, 1995) drew the attention of the international community to the key role played by women in food production, the share of women in world production being about 55 per cent which goes up to about 80 per cent in Africa's food. The Habitat II Conference (Istanbul, 1996) specified the need to establish healthy linkages between rural and urban areas and emphasised the role of cities in ensuring proper food distribution and drinking water supply. The World Food Summit (Rome, 1996) which took place at a time of growing international concern over slow growth in global food production and expanding population, gave a new impetus to the fight for food security by focusing attention on the food issues.

The concept of food security as understood now has been evolved over the last quarter century. Food security concept has been considered at a number of levels: global, regional, national, state, household and individual. While the ultimate concern may be at the household and individual levels it is important to realise that food security at the levels outside the household has a strong bearing on the performance at the household level. The World Food Conference of 1974, which was organised in the wake of the world food crisis of 1972-74 was largely concerned with global food security and it had recognised that world food security was a common responsibility of all nations and that international approaches were needed to achieve improved world food security (Sarris and Taylor, 1976). It was realised that fluctuations in food supplies over time and unstable food prices were the chronic problems of food security and that they required national and international solutions, such as inter-regional grain reserves of buffer stocks, grain insurance and similar other measures (Johnson, 1976; Valdes, 1981 and Konandreas *et al.*, 1978). In most of these proposals, world food security was generally understood "to imply arrangements whereby the population of the developing countries would be assured of a minimum level of foodgrains supply in years of normal as well as poor harvests (Reutlinger, 1977). It was implied that food security meant arrangements for providing physical supply of a minimum level of foodgrains at the national level, during all periods including those having harvest failures. It was subsequently recognised that physical availability alone would not ensure economic access to food for all population, especially the poor and vulnerable sections. Thus, it was emphasised that satisfactory production levels and stability of supplies should be matched by a reduction in poverty and an increase in the effective demand to ensure economic and physical access for the poor (FAO, 1987).

FAO (1983) had formulated that the basic concept of food security implied that " all people at all times have both physical and economic access to the basic food they need". The World Bank (1986) has modified this formulation to indicate that food security is " access by all people at all times to enough food for an active, healthy life. Its essential elements are the availability of food and the ability to acquire it." The World Bank has made a distinction between chronic and transistory food insecurities. Chronic food insecurity reflects continuos "inadequate diet caused by the inability to acquire food. It affects households that persistently lack the ability to either buy food or to produce their own." The transitory food insecurity is defined as "a temporary decline in the household's access to enough food. It results from instability in food prices, food production and household income - and in its worst forms, it produces famine".

Three Non-Governmental Organisation (NGO) networks handling food aid has enlarged the World Bank definition as follows (FAO, 1995):

"*access...to...food*"

Availability of food is a necessary, but not sufficient, condition for ending hunger. People require assured access to food. The route to that access may consist of income or work opportunities or the ability to acquire food through production, exchange or social entitlement programmes.

"*...by all people*"

Food security at the national or regional level does not necessarily indicate food security at the local or personal level. Often there is great disparity in food security among regions, communities, households and individuals. The NGO networks' approach is to target populations at the household level.

"*...at all times*"

A food-secure world requires a peaceful and stable environment. Civil and external conflict as well as natural disasters seriously disrupt food production, orderly marketing and stewardship of food reserves. Thus the NGO networks have a fundamental interest in conflict reduction and resolution and support disaster preparedness and mitigation activities.

"*... enough ... for an active, healthy life*"

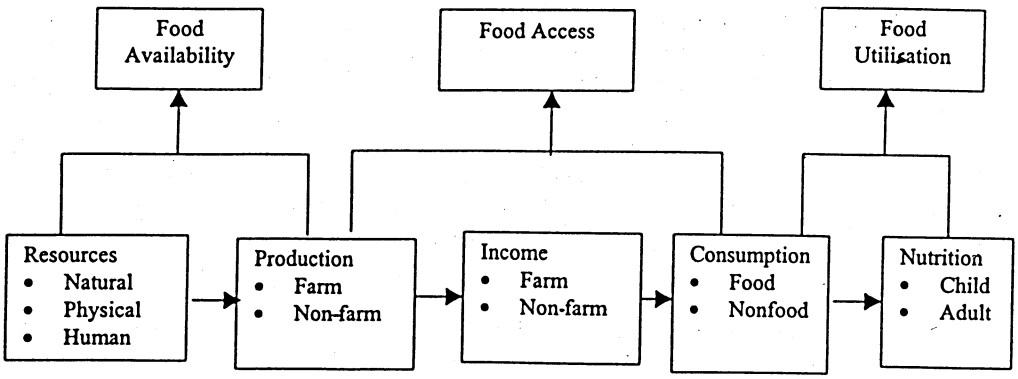
Food security means that individuals and households have access to sufficient food both in quantity and quality to meet their nutritional requirements. However, adequate food supply is not the only condition for ensuring an active and healthy life, and unless there is access to proper health care, water supply and other basic services, the food will not be efficiently used.

A draft document of the Sub-Committee on Nutrition (United Nations, 1987) defines household food security as follows: "A household is food secure when it has access to the food needed for a healthy life for all its members (adequate in terms of quality, safety and culturally acceptable) and when it is not at undue risk of losing such access." A wider definition of food security incorporates what is often referred in the quality of life indicators. Accordingly, food security implies livelihood security at the level of each household and all members within, and involves ensuring both physical and economic access to balanced diet, safe drinking water, environmental sanitation, primary education and basic health care. It is visualised that:

- Food security involves economic growth, especially access to resources.
- Food security touches on education, especially the education of women.
- Food security involves population programme; improved nutrition means lowered birth rates and increased child survival.
- Food security involves the natural environment.
- Food security is an issue of democracy.
- participation and accountability are the natural antidotes to starvation and malnutrition of food.

Chung *et al.* (1997) have summarised the diverse determinants of food security status in a general conceptual framework indicated in Figure 1. It focuses on the links between resources commanded by the households, levels of farm and non-farm production, household income, household and individual consumption, and individual nutrition.

Figure 1. A Conceptual Framework of Food Security and Generic Indicator Categories



Resources
Natural
Rainfall levels, stability
Soil quality
Water availability
Forest resources access

Physical
Livestock ownership
Infrastructure access
Farm implement ownership
Land ownership, access
Other physical assets

Human
Gender of household head
Dependency ratio
Education, literacy levels
Household size
Age of household head

Production
Total area cultivated
Irrigated area
Area in fallow
Access to and use of inputs
Number of cropping seasons
Crop diversity
Crop yields
Food production
Cash crop production
Number of sources of non-farm income
Cottage industry production

Income
Total income
Crop income
Livestock income
Wage income
Self-employment income
Producer prices
Market, road access
Migrant income

Consumption
Total Expenditure
Food expenditure
Non-food expenditure
Consumer prices
Dietary intake
Food frequencies

Nutrition
Anthropometry
Serum micronutrient levels
Morbidity
Mortality
Fertility
Access to health services
Access to clean water source
Access to adequate sanitation

Source: Chung *et al.*, (1997, p. 6).

Indicators of Food Security

The multiple dimensions and interlinked variables associated with food security make it difficult to evolve a single indicator to represent food security. Braun *et al.* (1992) have suggested the following indicators to capture the various dimensions at the country, household and individual levels:

- food security at the country level can be monitored, to some extent, in terms of demand and supply indicators.
- food security at the household level is best measured by direct surveys of dietary intake . It is important to note that current situation does not take care of the risk aspects, and also the changes in socio-economic and demographic variables such as wage rates, employment and price ratios.
- Anthropometric information can be useful to represent individual level measures.

Chung *et al.* (1997) have used the following indicators to households food insecurity based on triangulation among various qualitative methods:

- Owning poor quality land or no land
- Holding distress sales of large livestock or small livestock
- Holding distress sales of other productive assets
- Holding distress sales of other valued assets, such as jewellery
- Taking out a high number of small loans, especially from informal sources (neighbours, relatives, and shopkeepers)
- Choosing drought-tolerant crops when more profitable but risky options exist
- Relying heavily on wage work
- Accepting attached labourer positions
- Women who work for wages and have young children
- Migrating in search of work
- Having few income earners in a large family
- Purchasing staple grains more than once a week
- Suffering from physical disabilities or chronic illness
- Substituting inferior quality staple foods for preferred quality
- Substituting inferior quality vegetables or legumes, or going without
- Substituting gruels for the main staple (to stretch consumption)
- Providing dowries
- Buying gifts and fulfilling obligations to relatives
- Celebrating religious holidays.

Most of the quantitative and qualitative indicators of food security at the household level are linked to the poverty issues. In fact poverty is the major determinant of chronic food insecurity. As Sen (1981) points out, the poor do not have adequate means or entitlements to secure their access to food, even when food is available in local or regional markets. Here it should also be pointed out that though increases in household income contributes to improving the access to food, it need not improve the nutritional well being of all individual members of the household. Hendry (1991) points out that while there is irrefutable evidence that poverty is the most evident common denominator among nations, communities or households afflicted by chronic undernourishment, it is not the sole determinant. The extent of access to gainful employment, to arable land, to suitable technologies, and to other productive resources are important factors influencing under nutrition.

While analysing food security issues, it is important to highlight the following aspects:

(1) Increased food availability at the national level, though necessary to achieve food security, is not a sufficient condition for achieving household and individual food security. Physical access should be accompanied by economic access, which determines people's ability to acquire food.

(2) Food security implies measures beyond poverty eradication because the qualitative aspects of the diet as determined by the consumption habits also affect security. Inadequate attention to the nutritional quality of food consumed has adverse effects on the quality of life and the ability of individuals to sustain the benefits acquired through development efforts.

(3) Agriculture, being the main source of employment and income for a large proportion of the Indian population, development of agriculture and the rural economy is a major source of achieving food security at the national and household levels.

Production Performance

It may be recalled that increased availability of food is a necessary condition for achieving food security in food deficit countries. Since continued dependence on imports to ensure availability is not desirable based on economic, social and political considerations, enhanced agricultural production has been a stated objective of the national policy of many developing countries including India. In this context, it is important to review the production performance of Indian agriculture with a view to understand the trends and the major constraints in achieving physical access to food.

It is generally believed that India has maintained a satisfactory level of food production in the 1980s (Rao, 1997; Sawant, 1997). Foodgrain production in India has witnessed a steady increasing growth rate during the 1970s and 1980s from the rate of the previous decades, but the 1990s has witnessed a sharp fall in the growth rate. In fact the growth rate of foodgrain production during the 1990s has been close to the annual population growth rate, which implies a stagnant per capita production level.

Data available for the *kharif-rabi* split up of total production indicate that the *kharif* production has been more severely affected than the *rabi* production. The growth rate of *kharif* foodgrain production has declined from 2.23 per cent in the 1980s to 0.66 per cent per annum in the 1990s. Though growth rate of *rabi* foodgrain production had also experienced a decline during this period it was at a much smaller level a reduction from 3.33 per cent in the 1980s to 3.12 per cent per annum in the 1990s. The relatively low decline in the *rabi* growth rate is consistent with the growing importance of *rabi* production in the total foodgrain production, which indicates that the share of *rabi* production in the total foodgrain production has increased from 36 per cent during 1970-71 to 47 per cent in 1997-98.

The decline in the *kharif* production growth rate has been influenced by the decline in both area and yield. Though the area of *kharif* foodgrains had experienced negative growth rates during both the 1980s and 1990s, the decline was more rapid during the 1990s. Further the yield growth rate declined from 2.64 per cent during the 1980s to 1.80 per cent per annum during the 1990s. However, during the *rabi* season, due to the increased growth rate of area under foodgrains, the decline was mainly on account of the decline in the yield growth rate from 3.20 per cent during the 1980s to 1.60 per cent per annum during the 1990s. The

influence of the negative growth rate in the area under *kharif* foodgrains dominated the positive growth rate during the *rabi* season during both the 1980s and 1990s, so that there has been a negative growth rate in the combined area under foodgrains for *kharif* and *rabi* (Table 1).

TABLE 1. GROWTH RATES OF AREA, YIELD AND PRODUCTION OF FOODGRAINS IN INDIA: SEASONWISE

(per cent per annum)

Season (1)	1970s (2)	1980s (3)	1990s (4)
Kharif			
Area	-	-0.40	-1.13
Yield	-	2.64	1.80
Production	-	2.23	0.66
Rabi			
Area	-	0.14	1.39
Yield	-	3.20	1.60
Production	-	3.33	3.12
Kharif + Rabi			
Area	0.46	-0.23	-0.24
Yield	1.50	2.93	2.07
Production	1.96	2.70	1.84

A disaggregation of the foodgrain production trends according to major crops indicates non-uniform trends. The substantially higher growth rate of above 4 per cent experienced for rice during the 1980s has declined to 1.68 per cent during the 1990s, mainly due to the decline in the growth rate of yield of rice from 3.61 per cent during the 1980s to 1.32 per cent during the 1990s. Though wheat production growth rate had also declined during the 1990s over the 1980s, the decline was not so pronounced as in the case of rice, mainly because the fall in yield growth rate of wheat from 3.06 per cent during the 1980s to 1.66 per cent during the 1990s was somewhat compensated by the increased growth rate of area during the 1990s. The negative growth rate of area under coarse grains experienced during the 1980s continued during the 1990s also. However, a slight improvement in the yield growth rate of coarse grains during the 1990s has influenced production growth rate to show a small positive growth rate during the 1990s as compared to the negative growth rate during the 1980s. The decline in coarse cereal production, which is largely grown for self-consumption, has occurred along with changes in labour market involving decrease in self-employment, increase in wage employment and growing casualisation of wage labour (Vaidyanathan, 1986). The influence of the negative growth rate of area under coarse grains during both the 1980s and 1990s was such that in spite of the increasing trend in wheat area during the 1990s and the positive growth rate in the rice area, there had been a negative growth rate in the area of total cereals during both the 1980s and 1990s. The trend of negative growth rate in the area of pulses experienced during the 1980s has further worsened during the 1990s. However, the positive yield growth rate during both these periods had resulted in a positive growth rate of production of pulses.

The declining trend in the growth rate of food production during the 1990s has serious implications for national food security. Food self-sufficiency has been the most important objective of the national agricultural development policies specified in the plan documents

TABLE 2. GROWTH RATES OF AREA, YIELD AND PRODUCTION

(per cent per annum)

Crops (1)	1970s (2)	1980s (3)	1990s (4)
Rice			
Area	0.87	0.42	0.35
Yield	1.05	3.61	1.32
Production	1.92	4.04	1.68
Wheat			
Area	2.38	0.45	1.61
Yield	1.84	3.06	1.66
Production	4.22	3.51	3.20
Coarse Cereals			
Area	-0.87	-1.36	-2.02
Yield	1.96	1.08	2.44
Production	1.08	-0.28	0.42
Total Cereals			
Area	0.43	-0.26	-0.12
Yield	1.89	3.06	2.09
Production	2.32	2.81	1.97
Pulses			
Area	0.58	-0.13	-0.97
Yield	-1.90	1.60	1.23
Production	-1.32	1.46	0.22

and the 1980s gave the impression that this objective has been achieved. Prior to the 1980s much of the increase in foodgrain production has been through the extension of area, but the 1980s witnessed the shift towards rise in productivity as the major factor contributing to the increased output. However, during the 1990s there is stagnation on both these accounts. The share of foodgrains in the gross cropped area has been gradually declining from about 75 per cent during 1970-71 to 73 per cent during 1980-81 and to 66 per cent during 1992-93. It appears that modern technology, as represented by the coverage of high-yielding varieties (HYVs), which was the major contributing factor for the yield increases of the 1970s and 1980s has also stabilised to some extent. While the coverage of HYV paddy increased from 14.9 per cent during 1970-71 to 45.4 per cent during 1980-81 and to 64.2 per cent during 1990-91, it had increased only upto 74.2 per cent during 1997-98. In the case of wheat the HYV coverage was stabilised by 1990s (the HYV coverage was 29.4 per cent during 1970-71, 72.2 per cent during 1980-81, 86.8 per cent during 1990-91 and 86.1 per cent during 1997-98). Thus, it appears that major constraints are emerging in both dimensions of area expansion and stepping up yield through expanded coverage of HYV.

Per Capita Production

When resources (especially land) and technology constraints limit the aggregate food production, its negative impact on food security at the household and individual levels can be minimised to some extent by the efforts on curtailing population growth rates within tolerable limits. There are indications that fertility rates in some states are declining much faster than the levels anticipated by demographers a few years back. However, it should be clearly understood that aggregate balancing of supply and demand would involve imaginative policies and programmes to achieve sustainable levels of population growth.

The trends in per capita supply of foodgrains, which can be considered as an indicator of the improvements in food security at the individual level indicate that there had been a consistent upward trend in the per capita production of cereals and a consistent downward trend in the per capita production of pulses. The average per capita daily production of cereals was 362.8 grams gms during the 1960s and it has declined to 356.2 gms during the 1970s. However, this has gone upto 423.8 gms during the 1980s and to 449.3 gms during the eight years of the 1990s. The position of pulses indicated a negative trend throughout the four decades, with the average per capita daily production in the 1960s, 1970s, 1980s and 1990s remaining at 54.6, 43.5, 39.6, and 36.5 gms respectively. The growth rates of per capita net production indicate very low levels during the 1960s and 1970s, a somewhat higher level during the 1980s and a reduced level during the 1990s.

TABLE 3. GROWTH RATES OF POPULATION, NET PRODUCTION AND PER CAPITA NET PRODUCTION

Period	Growth rates (per cent per annum) of		
	Population	Net production	Per capita net production
(1)	(2)	(3)	(4)
1960s	2.19	2.29	0.10
1970s	2.25	2.31	0.06
1980s	2.11	2.80	0.69
1990s	1.77	1.93	0.16

Availability

The availability of foodgrains, derived from the accounting identity involving production levels, stock changes and trade balance, can be considered as a good estimate of the aggregate consumption, inspite of the limitations imposed by the problems in obtaining stock changes. The average daily per capita availability during the 1970s remained at a slightly lower level than the 1960s, but the 1980s and 1990s witnessed a moderate improvement in the availability level. It may be recalled that the consumption levels during the 1960s was maintained with heavy dependence on imports and from mid-seventies onwards, net imports was somewhat small and nine years turned out to be periods of marginal net exports. In spite of the improvement in the average per capita availability over the decades, it appears that there was no perceptible upward trend in the growth rates. In fact, the growth rates of per capita availability was a small negative value during the 1960s and it turned out to be positive during the 1970s, 1980s and 1990s. It can be further observed that the growth rates of per capita availability were below the growth rates of per capita production during the 1960s. However, the position was reversed during the 1970s, 1980s and 1990s with the growth rate of per capita daily availability being higher than the per capita net production and that the fall in consumption growth rate during the 1990s was not as marked as the fall in the production level.

TABLE 4. PER CAPITA DAILY AVAILABILITY OF CEREALS

Period (1)	Quantity (gms/day) (2)	Annual growth rate (per cent) (3)
1960s	447.5	-0.15
1970	444.2	2.08
1980	465.0	1.17
1990	488.0	0.58

Variability in Food Production and Availability

Some researchers (Braun *et al.*, 1992) would highlight the risk element in the food security concept as an important consideration. Risk can arise from variability in food production or household income. Therefore, stability in consumption levels would imply stability in income levels and stability in production levels, especially since the options of trade and aid in foodgrains as balancing influence on production instability may not be viable long-term alternatives in the Indian context.

The coefficient of variation of area, yield and production of foodgrains in India during the 1970s, 1980s and 1990s indicate that variability in foodgrain production has increased during the 1980s over the 1970s but between the 1980s and 1990s there has been a decline in the variability. The increased variability in production during the 1980s can be mainly attributed to the increased variability in yield level inspite of a reduction in the variability in area under foodgrains. During the 1990s both area and yield levels indicated a reduction in the variability. The declining variability in foodgrain production during the 1990s has been uniformly experienced by rice, wheat, coarse grains and pulses, and in all these cases yield variability has declined. However, for wheat and coarse grains there was an increased level of variability in area which was offset by the reduction in the yield variability. The increased variability in production of foodgrains during the 1980s was reflected in increased variability for rice and coarse grains, but there was reduced variability for wheat and pulses. Further, during the 1980s there was a reduction in the variability of area under rice, wheat and pulses, but yield variability increased for all crops except pulses (Tables 5 and 6).

TABLE 5. DIRECTION OF CHANGES IN VARIABILITY BETWEEN 1970s TO 1980s AND 1980s TO 1990s

Crops (1)	1970s to 1980s			1980s to 1990s		
	Area (2)	Yield (3)	Production (4)	Area (5)	Yield (6)	Production (7)
Rice	-	+	+	-	-	-
Wheat	-	+	-	+	-	-
Coarse grains	+	+	+	+	-	-
Total cereals	neg	+	neg	-	-	-
Pulses	-	-	-	-	-	-
Total foodgrains	-	+	+	-	-	-

+ increase; - decrease; neg:negligible.

The variability in production levels was somewhat offset by stock adjustments and trade so that variability in availability was substantially reduced. As indicated in Table 6, during all the three decades, the variability in per capita availability of cereals remained at a lower level than the variability in per capita production.

TABLE 6. COEFFICIENT OF VARIATION IN AREA, YIELD, PRODUCTION AND AVAILABILITY

(1)	1970s (2)	1980s (3)	1990s (4)
Area			
Rice	3.21	3.15	1.27
Wheat	8.31	3.26	4.52
Coarse cereals	3.86	4.73	5.48
Total cereals	2.20	2.24	1.35
Pulses	4.47	3.73	3.68
Total foodgrains	2.52	2.35	1.65
Yield			
Rice	8.57	13.66	4.25
Wheat	8.02	9.90	5.29
Coarse cereals	9.38	19.16	10.34
Total cereals	8.52	10.32	5.59
Pulses	11.58	6.91	6.21
Total foodgrains	7.82	9.88	5.69
Production			
Rice	11.44	15.58	4.93
Wheat	15.48	11.77	8.63
Coarse cereals	9.64	20.66	10.40
Total cereals	10.59	10.46	5.70
Pulses	12.44	8.56	6.93
Total foodgrains	9.98	10.15	5.58
Availability			
Cereals	5.71	5.06	3.93
Pulses	9.85	9.45	8.57
Total foodgrains	5.49	5.25	3.87

Consumption

The per capita availability of food obtained from the accounting identity indicates only a broad aggregate picture and it has serious limitations in analysing the nutritional status of individuals and households. To some extent this limitation can be overcome by using data available from NSS consumer expenditure surveys and other diet surveys carried out in some regions.

Cereal Consumption

The surveys conducted by National Sample Survey Organisation (NSSO) provide data on quantity and expenditure on different consumption items, and in a few cases the nutritional values of food items consumed. The estimates of monthly per capita cereal consumption from different rounds of National Sample Survey (NSS) indicate a consistent downward trend in both the rural and urban areas during the 1960s and 1970s, and a somewhat stable level during the 1980s and early 1990s (Table 7). These data also indicate that the consumption estimates from the NSS had been very much above the per capita availability data

indicated in Table 4 for the 1960s and 1970s. However, from the 1980s onwards, there is close association between the NSS estimates and the per capita availability data, even though the per capita availability indicates a slightly higher level than the NSS consumption estimates.

TABLE 7. ESTIMATES OF ALL-INDIA MONTHLY PER CAPITA CEREAL CONSUMPTION (*kg*)

Year (1)	Rural (2)	Urban (3)
September 1961 - July 1962	17.55	12.50
October 1972 - September 1973	15.46	11.32
October 1973 - June 1974	15.21	11.37
July 1977 - June 1978	15.40	11.72
January - December 1983	14.90	11.38
July 1986 - June 1987	14.40	11.04
July 1987 - June 1988	14.54	11.25
July 1988 - June 1989	14.62	11.27
July 1989 - June 1990	14.05	11.09
July 1990 - June 1991	14.21	10.90
July 1993 - June 1994*	14.30	11.30

Source: Suryanarayana (1996, Tables 5 and 6).
* Derived from the calorie data from *Sarvekshana*, October-December 1997.

Nutritional Status

The NSS 38th Round (1983) and 50th Round (1993-94) provide nutritional levels of the sample households and individual consumers. According to nutritionists, human diet should contain minimum levels of various items such as calories, proteins, fats and a number of micro nutrients. However, there is a feeling among some nutritionists that a diet with adequate level of calories might contain more or less sufficient quantities of major nutrients with some exception. The calorie requirement of an individual is determined on the basis of various factors such as body weight, nature of work, age, sex and climate. Though the calorie requirements vary among individuals, a per capita norm is used for aggregate analysis. While the Indian Council of Medical Research has recommended a per capita daily norm of 386 gms of cereals (Radhakrishna, 1991), the Task Force of the Planning Commission (Government of India, 1979) has recommended 15.46 kg cereals per capita per month (515 gms per day) for the rural population for defining the poverty line. The recommendation of the Task Force implied a per capita calorie norm of 2,400 for rural areas and 2,100 calories for urban areas. The NSS has been using a daily norm of 2,700 calories per consumer unit and actual consumption levels were compared against this norm to determine the adequacy of the diet (NSSO, 1997).

The estimates of per capita daily calorie intake and per consumer unit daily calorie intake for rural areas obtained from the 50th Round of NSS indicate an average level of 2,153 kcal and 2,683 kcal respectively. Though the average daily intake per consumer unit is very close to the specified norm, there were wide variations among the different expenditure groups. In the rural areas, the average per diem intake per consumer unit remained below 2,700 kcal for all consumers with a monthly per capita expenditure level below Rs. 265. Thus 51.9 per cent of the rural consumers had experienced calorie deficiency though the level of deficit

decreased with increased expenditures. It is also worth pointing out that the percentage share of calories from cereals which was 83.4 for the lowest expenditure group has declined gradually to 55.2 in the highest expenditure group (Table 8).

TABLE 8. CALORIE INTAKE IN RURAL AREAS

Monthly per capita expenditure (Rs.) (1)	Percentage of sample consumers (2)	Per capita per diem intake (kcal) (3)	Per consumer unit per diem intake (kcal) (4)	Percentage of cereals (5)
Less than 120	3.6	1,327	1,700	83.4
120 - 140	4.1	1,583	2,004	81.4
140 - 165	7.3	1,721	2,173	79.9
165 - 190	9.3	1,850	2,320	78.0
190 - 210	7.7	1,968	2,457	76.6
210 - 235	9.4	2,048	2,555	74.3
235 - 265	10.5	2,154	2,676	72.6
265 - 300	10.0	2,271	2,810	70.7
300 - 355	12.1	2,410	2,981	68.2
355 - 455	12.3	2,592	3,204	64.2
455 - 560	6.3	2,804	3,448	60.9
560 and above	7.4	3,262	3,985	55.2
All classes	100.0	2,153	2,683	71.0

Source: Sarvekshana, October-December 1997, p. 13.

The calorie intake in the urban areas also indicates similar tendencies as in the rural areas. The lowest per capita monthly expenditure group of less than Rs. 160 had a per diem intake of 1,674 kcal, which increased gradually to 3,628 kcal in the highest group of above Rs. 1,055. The average daily calorie intake was 2,542 kcal per consumer unit, which was less than the level for the rural areas. The norm level of calories was achieved only in the expenditure groups above Rs. 490, which indicates that more than two-thirds of the urban consumers had not achieved the calorie consumption norm. It is also worth pointing out that calories from cereals accounted for only 58.5 per cent of the total calories for all expenditure categories in the urban areas as against 71.0 per cent in the rural areas. Even the lowest expenditure group in the urban areas had obtained only 76.8 per cent of calories from cereals and it dropped to 38.5 per cent in the highest expenditure group (Table 9).

In view of the shortcomings involved in using the statistical average norm of 2,700 kcal for nutritional adequacy, the calorie intake levels were grouped into three categories: (1) norm level calorie intake with 10 per cent fluctuation (90-110 per cent), (2) below norm (less than 90 per cent), and (3) above norm (above 110 per cent).

According to this classification, 36.9 per cent of the rural households and 41.6 per cent of the urban households had met less than 90 per cent of the calorie norm. During the 38th Round of NSS also, the position was somewhat similar, though there is a slight decline in this percentage over the decade in both the rural and urban areas.

TABLE 9. CALORIE INTAKE IN URBAN AREAS

Monthly per capita expenditure (Rs.) (1)	Percentage of sample consumers (2)	Per capita per diem intake (kcal) (3)	Per consumer unit per diem intake (kcal) (4)	Percentage of cereals (5)
Less than 160	4.4	1,327	1,674	76.8
160 - 190	4.4	1,560	1,957	74.1
190 - 230	8.8	1,697	2,112	71.4
230 - 265	8.8	1,787	2,216	68.7
265 - 310	10.9	1,890	2,323	65.8
310 - 355	9.5	1,987	2,443	63.2
355 - 410	10.0	2,070	2,533	60.1
410 - 490	10.9	2,186	2,668	57.1
490 - 605	10.3	2,299	2,795	53.1
605 - 825	10.3	2,474	2,996	49.0
825 - 1,055	4.7	2,689	3,234	42.9
1,055 and above	7.0	3,011	3,628	38.5
All classes	100.0	2,071	2,542	58.5

Source: Sarvekshana, October-December 1997.

The distribution of persons also indicated that 42.0 per cent of the rural consumers and 48.8 per cent of urban consumers had received only less than 90 per cent of the calorie norm during 1993-94. A comparison with the 1983 levels indicates that during the interval the proportion of rural consumers with less than 90 per cent calorie norm has increased marginally, but in the urban areas there was a marginal reduction (Table 10).

TABLE 10. DISTRIBUTION OF HOUSEHOLDS AND INDIVIDUALS ACCORDING TO CALORIE INTAKE LEVEL

(per cent)

Location (1)	Calorie intake level (per cent of norm) (2)	Households		Individuals	
		38th Round (1983) (3)	50th Round (1993-94) (4)	38th Round (1983) (5)	50th Round (1993-94) (6)
Rural					
	Less than 90	37.6	36.9	40.9	42.0
	90-110	23.5	27.4	24.2	28.4
	110 and above	38.9	35.8	34.9	29.6
Urban					
	Less than 90	43.9	41.6	52.0	48.8
	90-110	25.7	28.1	25.1	28.1
	110 and above	30.4	30.4	22.9	23.2

Source: Sarvekshana, October-December 1997.

Thus both the rural and urban areas indicate a sizeable proportion of consumers with inadequate calorie intake. The deficiency is acute in the lowest expenditure groups and there is gradual improvement as the monthly expenditure increases. Inadequate levels of food consumption leads to malnutrition, which is considered to be a serious problem, especially among women and children. According to one estimate (IIPS, 1995, quoted in Dev, 1997), at the all-India level around 53 per cent of the children under 5 were underweight (below 2

standard deviation) and the infant mortality was 78.5. Among the different states in India the percentage of under-weight children varied between 28.5 in Kerala and 62.6 in Bihar. The infant mortality ranged between 23.8 in Kerala and 99.9 in Uttar Pradesh.

Link between Calorie Intake and Poverty

The distribution of households according to per capita expenditure class and calorie intake level clearly indicates that poverty is the main factor influencing inadequate calorie intake. While the low percentage of consumers with inadequate calorie intake in the higher expenditure groups could be explained by inadequate knowledge or special tastes and preferences the large proportion of consumers with inadequate calorie intake in the lower expenditure groups can be attributed to insufficient purchase power. As indicated earlier, 51.9 per cent of the rural consumers with monthly per capita expenditure of less than Rs. 265 and 67.7 per cent of the urban consumers with monthly per capita expenditure of less than Rs. 490 had inadequate calorie intake. Among the households, 55.3 per cent of the rural households and 61.9 per cent of the urban households belonged to the monthly per capita expenditure groups with below average levels of adequate calorie intake.

A further analysis of the distribution of households according to inadequate calorie intake levels indicate that in the rural areas 89.1 per cent of those with less than 70 per cent required calorie intake had monthly per capita expenditure levels below Rs. 265. This percentage declined as the calorie intake level increased. The urban scenario also indicated a similar tendency of declining percentage of households with monthly per capita expenditure corresponding to inadequate calorie consumption level as the level of calorie intake increased (Table 11).

TABLE 11. PERCENTAGE OF HOUSEHOLDS IN THE EXPENDITURE GROUPS WITH AVERAGE CALORIE INTAKE OF LESS THAN 2,700 ACCORDING TO CALORIE INTAKE LEVEL

Calorie intake level (per cent of norm) (1)	Rural households with monthly per capita expenditure below Rs. 265 (2)	Urban households with monthly per capita expenditure below Rs. 490 (3)
Less than 70	89.1	90.9
70 - 80	81.9	85.8
80 - 90	70.0	76.9
90 - 100	60.5	65.2
100 - 110	49.5	53.5
110 - 120	45.2	43.8
120 - 150	23.5	40.9
150 and above	7.7	17.1
All classes	55.3	61.9

Source: Sarvekshana, October-December 1997.

Requirement of Cereals for Meeting Calorie Deficit

Based on the estimates of calorie intake of different expenditure groups, it is possible to estimate the quantity of cereals required to bridge the calorie gap. As indicated earlier, in the rural areas, calorie gap existed in all expenditure groups with monthly per capita expenditure upto Rs. 265. Among the consumers with per capita monthly expenditure of less than Rs. 120, the calorie gap was 1,000 kcl and by the time they reached the required

level of calories, 72 per cent of the calories would be obtained from cereals. This implies an additional consumption of 225 gms of cereals per day to meet the calorie gap. When the requirements for the other calorie deficit expenditure classes were estimated it was observed that the weighted average of additional cereal consumption requirements to meet the calorie deficit of all groups was 75 gms per day which implies an additional consumption of 39 gms per day for the total rural population. Similar estimates for the urban areas indicated an additional consumption of 68 gms per day for the calorie deficit groups and 46 gms per day for the total urban population. Thus an additional consumption of 41 gms of cereals per day is required to bridge the calorie gap of the total population. The average per capita availability of cereals for the 1990s was 488 gms per day, which should go upto 529 gms per day when the calorie gap of all consumers are bridged on the assumption that the consumers with adequate calorie levels do not alter their cereal intake. If it is envisaged that all consumers would achieve food security by 2015, the implication is that the total cereal availability in 2015 should be 234.0 million tonnes.[1] The implied compound growth rate of 2.3 per cent over the 1998 level of cereals availability appears to be within the reach with appropriate policies for increased production and improved storage and handling facilities to reduce the losses at these levels. However, it should be emphasised that physical access will not ensure food security unless it is matched by economic access to the poor. It may be recalled that in the rural areas, the per capita expenditure required for adequate calorie intake was Rs. 270, and for the per capita expenditure group of Rs. 120-140, the required increase implied an annual compound growth rate of 4.3 per cent at constant prices. The required growth rate is even much higher than this level for the lowest expenditure group. It is doubtful if the Indian economy can sustain this level of annual growth rate in per capita expenditure for the poor over the next 15 years. Therefore, the crucial issue for achieving food security for the poor by 2015 will be economic access to the poor, even though physical access is within achievable limits.

Policies and Programmes for Achieving Household Food Security

The polices and programmes for achieving household food security are based on the identification of the characteristics of the food insecure households and individuals. As indicated earlier, there is a close link between poverty and household food security, which highlights the relevance of various macro economic policies and poverty alleviation programmes. Since the majority of poor live in the rural areas and since most of them are small farmers or landless agricultural labourers, the policies pursued in relation to agricultural development have a high significance. Apart from the macro economic policies in general, and in particular the agricultural policies and poverty alleviation programmes, a number of direct interventions such as public distribution of foodgrains and feeding programmes are relevant in the context of achieving household food security.

Poverty

There has been much debate about the methodology for estimation of poverty and its trends over time. However, most of the estimates indicate a sizeable number of poor in India, the estimates being around one-third of the total population.

According to the estimates obtained from the NSS data using the methodology suggested

by the Expert Group appointed by the Planning Commission (Government of India, 1993), 48 per cent of the rural population and 43 per cent of the urban population were poor during 1955-56. By 1993-94, the percentage of poor in the rural and urban areas remained at 39 per cent and 30 per cent respectively. The poverty estimates presented in Table 12 indicate a significant reduction of poverty during the 1980s, which can be attributed to "both economic growth with relatively low inflation rates and anti-poverty programmes" (Dev, 1996).

TABLE 12. POVERTY ESTIMATES (HEAD COUNT RATIOS), ALL INDIA

Year (1)	Rural (2)	Urban (3)	Total (4)
1955-56	48.3	43.2	47.4
1960-61	45.4	44.6	45.3
1965-66	57.6	52.9	56.8
1970-71	54.8	45.0	52.9
1977-78	50.6	40.5	48.6
1987-88	39.6	35.6	38.7
1990-91	36.4	32.8	35.5
1993-94	38.7	30.0	36.5

Source: Dev (1997).

Macro-Economic Policies

Macro-economic policies have both short-run and long-run effects on food security of the poor through its implications for employment, income and prices. In the early years of planned economic development in India, growth was visualised as an important contributor of poverty alleviation. However, with the doubts raised on the effectiveness of trickle down mechanisms to raise the standard of living of the poor since the mid sixties, distributional aspects were directly incorporated in the national policies. A number of anti-poverty programmes were also initiated to combat poverty. The measures initiated for restructuring the economy through macro economic adjustments and trade liberalisation also have its impact on employment and income levels of the poor. Price policies and measures for controlling inflation are expected to help the poor to improve the consumption basket.

Dreze and Sen (1989) have made a distinction between the approaches followed in the different policies as "growth-mediated security" and "support-led security". The growth-mediated security aims "to promote economic growth and take the best possible advantage of the potentialities released by greater general affluence, including not only an expansion of private incomes but also an improved basis for public support". The support-led security envisages "to resort directly to wide-ranging public support in domains such as employment provision, income distribution, health care, education and social assistance in order to remove destitution without waiting for a transformation in the level of general affluence".

Agricultural Policies

Agricultural development policies pursued by the Central and State Governments have wide ranging influence on food security through availability of food (which determines physical access), farm income and employment opportunities. The specific policies followed in this category include support for technology, irrigation, farm inputs, agricultural prices, agricultural credit, institutional framework including tenancy and land reforms, agricultural

trade, and infrastructure including agro-processing industries, transport facilities and agricultural marketing. Most of these policies were initiated to achieve the national goals such as self-sufficiency in food production, equity and resource use efficiency. Programmes for increased food production, both for home consumption and for commercial purposes, influence household food security through increased physical access and increased purchasing power through sale of agricultural products and promotion of employment opportunities (Binswanger and Braun, 1991). The beneficial impact of technological changes, as reflected in the Green Revolution, were identified to include increased farm output, employment and wages (Bhalla, 1983). The policies for maintaining food prices within the reach of the poor on the one hand, and safeguarding the interests of the farmers through remunerative prices also had their impact on food security. While there has been a realisation that the benefits through major agricultural programmes can be fully utilised by the rural poor only when the poor gets control over resources, especially land, in the absence of adequate measures on land reforms (redistribution, tenancy reform and consolidation of holdings) the poor have not been able to derive the full benefits of these measures in many areas, with the possible exception of Kerala and West Bengal. There is a feeling that the problems of the rural poor cannot be solved by simply augmenting agricultural production. Vyas (1986, pp. 211-212) has pointed out that the diversification of the rural economy is the major challenge. He asserts that "without conscious decisions to encourage non-farm activities, the large bulk of the rural people cannot be provided with opportunities for gainful employment and income and access to food".

Anti-Poverty Programmes

The various anti-poverty programmes followed in India can be broadly classified as Income and Employment Generation Programmes and targeted distribution programmes. While the activities initiated under the macro-economic policies and agricultural development policies might contribute towards increased food production (physical access) and increased purchasing power (economic access), anti-poverty programmes might contribute towards increased economic access and stabilize the demand for food for the food insecure population.

Income and Employment Generation Programmes

The income and employment generation programmes pursued in India belong to two broad categories of self-employment and wage employment programmes. The major self-employment programmes include the Integrated Rural Development Programme (IRDP), Training Rural Youth for Self-Employment (TRYSEM) and Development of Women and Children in Rural Areas (DWCRA). The Jawahar Rogar Yogana (JRY) is the main wage-employment programme pursued at the all-India level, and some state governments have employment guarantee schemes along the lines of the Employment Guarantee Scheme in Maharashtra.

Integrated Rural Development Programme

The basic objective of the IRDP which was introduced during the sixth five year plan (1980-85) period as a follow up of the earlier Small Farmer Development Agency (SFDA) and the Marginal Farmer and Agricultural Labour (MFAL development programme)[2] has been "to enable identified rural poor families to augment their incomes and cross the poverty line through acquisition of credit based productive assets" (Government of India, 1999, p. 147).

Assistance provided under this programme includes subsidy by the government and a low-interest term credit by the financial institutions for income generating activities. The number of beneficiary families under the IRDP from 1980-81 to November 1998 is estimated to be 53.5 million (an average of 3 million families each year). The level of family investment increased from Rs. 1,642 during 1980-81 to Rs. 17,441 during 1998-99.

Many evaluation studies of the IRDP have been critical about the efficiency of achieving poverty alleviation through asset creating self-employment programmes, choice of activities for providing subsidy (a large share for purchasing cattle) and the choice of beneficiaries (Rath, 1985; Dreze, 1990; Tendulkar *et al.*, 1993). However, some others would argue that the programmes under IRDP may have achieved very little and may have been misconceived, but that does not prove that the strategy of generating assets for the poor and upgrading their skills is wrong (Dantwala, 1985).

Training of Rural Youth for Self-Employment (TRYSEM)

The objective of the programme is to train rural youth in the age group of 18-35 from the families below poverty line to develop some skills required for them to take up self-employment programmes in the broad fields of agriculture and allied activities, industries and service sectors. There is also a provision for assistance to start own enterprises with loan and subsidy under IRDP to the rural youths trained under TRYSEM. The annual target for the last three years has been around 2.9 lakh youth of which scheduled castes and scheduled tribes coverage was expected to be a minimum of 50 per cent. Further, at least 40 per cent of the beneficiaries were expected to be women. While the quantitative targets have been often achieved, there is very little information on the extent of income generated by the trainees.

Development of Women and Children in Rural Areas (DWCRA)

The DWCRA is a sub-component of the IRDP and its main objective is to provide opportunities of self-employment to women members of households below poverty line. The strategy is to focus on groups consisting of 10-15 women and the activities included specific items in the areas of social welfare, health, nutrition, employment and education. During 1997-98 about 40,000 groups were to benefit 4.6 lakh women. Here again, the contribution of these programmes to income generation is not properly estimated.

Jawahar Rozgar Yojana (JRY)

JRY, which was created by merging the earlier programmes of National Rural Employment Programme (NREP) and Rural Landless Employment Guarantee Programme (RLEGP), is the major wage employment programme. The main objective of JRY is to create additional gainful employment for the unemployed and under employed rural population living below the poverty line. It also envisages strengthening of rural economic infrastructure and creation of durable community assets to improve the quality of rural life. An evaluation study of the JRY conducted in 1992 has indicated that more than half the beneficiaries were above the poverty line (Neelakantan, 1994).

In addition to these major employment and income programmes, there are a number of other programmes such as the Employment Assurance Scheme (EAS), the Swarana Jayanti Shabari Rozgar Yojana (SJSRY) and the Prime Ministers Rozgar Yogana (PMRY).

Target-Oriented Programmes

Public Distribution System and nutrition programmes are the two important items among the target-oriented programmes.

Public Distribution System (PDS)

The PDS, which has its origin during the Second World War period, has been an important source for enhancing the food security of the poor (George, 1983). The Central Government has the responsibility for the supply of rice, wheat, sugar, imported edible oils and kerosene to the state governments and these items are distributed through a network of about 4.5 lakh retail outlets known as the fair price shops. While the coverage was mainly confined to major urban areas in many states, some deficit states such as Kerala has an elaborate network of fair price shops for distribution of foodgrains and other essential items and cereals purchased from these shops accounted for a major share of the consumption of the low income groups (George, 1979, 1996). A number of studies on PDS have brought out the problems of PDS such as inadequate coverage (Parikh, 1994), lack of price advantage (Radhakrishna and Indrakant, 1987), leakages (Ahluwalia, 1993), urban bias[3] and inefficiencies of handling agencies, including the Food Corporation of India.[4] Consumer subsidy for 1998-99 was estimated to be Rs. 4.75 for one kilogram of rice and Rs. 4.20 for one kilogram of wheat (Government of India, 1999). In view of the increased subsidy involved in the operation,[5] from June 1997 a revised scheme of distribution known as the Targeted Public Distribution System (TPDS) was introduced. The TPDS envisages a two-tier system of delivery to households below poverty line (BPL) and above poverty level (APL) with BPL families receiving foodgrains at heavily subsidised prices. The average offtake of rice during 1991-92 to 1996-97 was 9.7 million tonnes and that of wheat was 7.2 million tonnes. The offtake from TPDS during 1997-98 was 9.9 million tonnes of rice and 7.2 million tonnes of wheat.

Nutritional Programmes

The nutritional programmes include supplementary feeding vitamin supplements and Integrated Child Development Services (ICDS). Supplementary feeding programmes aim at controlling protein energy malnutrition among pre-school children, and pregnant and nursing women, and also to improve school enrolment and nutritional status of elementary school children. Programmes for supplementing vitamins include distribution of vitamin A among pre-school children, folifer tablets (iron and folic acid) among pre-school children and nursing women, and iodized salt. The ICDS, whose target group included children below the age of 6 and expectant and nursing mothers, offers a package of services including health check-ups, immunisation, supplementary feeding, nutrition and health, pre-school education for children and nutrition education for mothers. The ICDS which was started with 33 experimental projects has expanded to about 3400 projects covering about 18 million children and 3.5 million mothers. In spite of the limitations of ICDS, it is worth noting that most of the ICDS beneficiaries belong to deprived socio-economic groups and they have experienced a decline in the incidence of morbidily and also an improvement in the enrolment in primary schools and decrease in school dropout rates.

CONCLUDING REMARKS

Food security is often considered at different levels such as global, regional, national, sub-regional, households and individuals. While the early concerns had been mainly confined to global and regional food security, during the last two decades the focus has shifted to food security concerns at the national, household and individual levels, and this shift has modified and enlarged the concept itself.

In relation to the national food security, there are indications that the production performance of Indian agriculture during the 1980s has maintained a satisfactory growth rate, but there are indications of falling growth rate during the 1990s. The fall in the growth rate during the 1990s has been more pronounced during the *kharif* season than during the *rabi* season, with negative growth rates in area under foodgrains, mainly coarse cereals and reduced growth rates in yield as compared to the levels achieved during the 1980s. The trend in per capita production indicates a consistent upward tendency for cereals and a consistent downward tendency for pulses. The growth rates in per capita availability of cereals remained at a higher level than the growth rate in per capita net production. Between the 1980s and 1990s there has been a decline in the variability in yield and production of all cereals and pulses. The variability in per capita availability of cereals remained at a lower level than the variability in per capita production.

With somewhat satisfactory levels of national food security influenced by the production performance of Indian agriculture during the past decades, attention has been shifted from national food security concerns to individual and household food security. While household food security is influenced by both physical access and economic access, food security of individual members of the household is influenced by intra-household allocation of food. Available data on food consumption pattern indicates that about half the rural consumers and about two-thirds of the urban consumers had nutritionally inadequate food consumption levels. The growth rate of foodgrain production required to ensure physical access to the levels needed to raise the consumption levels of the under nourished Indian households to satisfactory nutritional levels by 2015 appears to be modest. However, it is conditioned by

two important considerations:- that the declining trend in the population growth rate should be maintained and that the declining growth rate in the production of foodgrains experienced during the 1990s should be reversed. With the emphasis on reproductive health and improved education levels it is possible to visualise that population growth will be kept under control.

In view of the declining tendency of area under foodgrains, especially coarse grains, the growth rate of yield should be maintained at a higher level than the required growth rate of production. The wide gap between the potential yield levels, as indicated in the yield levels obtained in demonstrations under farm conditions and the realised average yield levels suggest that higher yields are achievable. However, sustaining a growth rate of yield above an annual compound rate of 2.5 per cent would require efficient and optimal resource use of land, surface and ground water, and genetic resources, greater attention to cropping systems than individual crops, revamping the research and extension systems towards varietal improvement for dryland crops, strengthening adaptive local research, emphasis on bio-diversity and ecological balances, improving rural infrastructure including processing, marketing and storage, education and access to mass media, and development of rural financial markets (Vaidyanathan, 1994).

It has been pointed out that increased food production at the national level does not guarantee that the poor in India, estimated to be around half the world's poor, will have economic access to food either from increased income levels or from reduced prices, unless there is a conscious effort to overcome this problem. Maintaining physical access through increased food supplies has an impact on food security through maintaining price levels under control and creating incomes by promoting rural employment opportunities. However, there is no guarantee that increased food production will lead to decline in food prices to such levels that will permit the poor to buy foodgrains at the market rates. Finding an appropriate policy-mix that provides incentives for increased agricultural production and meeting the consumer demand for low-cost food has been a difficult proposition, and imaginative policies and programmes are needed to achieve this.

Economic access to food for the poor could be achieved through a mix of employment and income policies for the farm and non-farm sectors and through a minimum safety net. In view of the heavy dependence of a large proportion of the rural population on agriculture for employment and income, the main elements of the strategy for reduced poverty and enhanced food security should be based on a broad approach towards agricultural and rural development. While the employment effects of technological change in agriculture are often a function of the nature of technology and the local labour market conditions, it is possible to visualise that increased production creates demand for additional labour both in the farm and non-farm sectors, partly through the multiplier effects of agriculutral growth (Mellor, 1986). Since labour households account for a large proportion of the food-insecure population, increased employment opportunities will make substantial contributions towards expanding the economic access to this group. Further, there is some evidence that regions with higher initial levels of female labour force participation in India, mainly in agriculture have experienced larger growth of per capita expenditure, and also faster poverty decline (Dreze and Srinivasan, 1996).

As fragmentation of holdings and landlessness increase, creation of off-farm employment for the rural poor assumes high priority. In the absence of appropriate measures to encourage non-farm activities, a large segment of the rural population cannot be provided with

opportunities for gainful employment and economic access to food. The human dimension of this problem is such that helping people to help themselves by capacity building can provide a lasting solution.

In order to be effective the food security policy must evolve as a basic element of a social security policy with proper co-ordination among the various government departments, private sector and non-government organisations. The direct food and nutrition support for the poor through a minimum safety net should be properly balanced with improvements in the quality of life of local people through investments in education, drinking water and sanitation, and health care.

Further, future food security programmes should have a broad objective of increased agricultural production and enhanced access to food through a participatory approach of local people with emphasis on resources efficiency, social equity and preservation of the environment (George, 1994). Centralised anti-poverty programmes should give way to local initiative and local participation based on the principles of efficiency, equity and environmental conservation.

NOTES

1. Based on the UN median population estimate of 1212 million in 2015 (see United Nations, 1997).
2. A detailed review of the history and performance of the IRDP during the initial years is available in Rath (1985).
3. The urban bias can be considered as a legacy of the initial strategy of rationing and price stability for the working class (see Dantwala, 1993).
4. Considering these inefficiencies, Bhagwati and Srinivasan (1993) has suggested dismantling of the Food Corporation of India and shifting to food stamps for the poor. However, it should be kept in mind that experience in some countries indicates that food stamps cannot safeguard the interests of the poor if they are not linked to the increase in general price level.
5. Food subsidy increased from Rs. 2,850 crores in 1991-92 to Rs. 6,066 crores in 1996-97: The food subsidy of Rs. 7,500 crores in 1997-98 and the budget estimate of Rs. 9,000 crores for 1998-99 do not indicate any reduction.

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