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FOOD SECURITY



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INSIDE

The government announced in 2009 that a Food Security Act will be passed to ensure a particular quantum of wheat and rice to the needy households. Since then there has been debate on the various aspects of the Food Security Act and its implication in money terms. In this issue we carry forward the debate focusing on the demand and supply side of food grains and other related parameters.

The government is making efforts to address the issue of hunger and under nutrition in the country so that every citizen does not go to bed hungry while the country grows at one of the fastest pace in the world. Inclusive growth is the guiding principle behind all major developmental policies of the government.

Paradoxically, though India is one of the largest producers of food in the world, yet millions of people struggle to get two square meals a day and an equal number are under nourished.

While efforts need to be made to increase production and productivity of food grains, providing access to the needy remains a major challenge.

Some studies suggest that the per capita availability of food grains has in fact dropped in the last two decades. Rising cost of food grains due to supply-side factors is said to be one of the reasons behind this drop.

Ensuring food for all the citizens is a complex exercise related to availability of food, its affordability, and providing access. Some argue this is an issue of policy and management of the resources. The role of the Gram Sabha as an institution of administration can be instrumental in the management of food grains, which we discuss in this issue.

India has witnessed the Green Revolution and is readying for the second round of the Green Revolution with newer farm technologies and innovations in farming systems. Yet, many go hungry every day. Whether the issue is managerial, technical, policy related, no one should go hungry in this country.

Food Security in India: Key Issues

S. P. Singh

In recent years, the Government of India has taken several initiatives towards ensuring rights and entitlements of citizens of the country. Right to information, right to employment and right to food are the key initiative in this context. Making universal access to food is now a hot topic of debate and discussion in various academic, political and public forums. To provide legal entitlement of access to food to the people of country, the National Advisory Council (NAC) prepared a draft of National Food Security Bill (NFSB).

Problem of food security cannot be viewed only in terms of procurement and distribution of food. It should also be seen in the context of production of food grains, livelihood of people and overall management of food economy. The green revolution technology, despite its severe criticism on equity, ecology and environment grounds, has made significant contribution in transforming the food-deficit economy into food-surplus one. Agricultural development during this period was largely supply-driven, backed by

policy support, sincere efforts of agricultural scientists, and the hard working farmers who positively responded to the new technology. By contract, agricultural development in the last two decades to a greater extent has been driven by demand-side factors. Agriculture has begun to diversify towards high value commercial crops, including horticulture, floriculture and livestock products, especially to cater to the need of growing middle and upper middle class households whose dietary pattern have been shifting from food grains to these products.



Since land, water and other resources are limited and have competitive use in agriculture as well as in non-agriculture activities, a diversion of resources towards these crops would have some adverse consequences for the availability and accessibility of 'wage goods', such as cereals and pulses to the common masses. Presently, a large number of households, especially living in rural areas and urban slums, are not able to get adequate quantity of food and thus suffer from chronic poverty and hunger. They face both supply and demand side constraints in getting access to food which could be removed through enhancing food production and productivity, removing the bottlenecks in the distribution and management of food grains, generating more employment opportunities to the poor people and improving their livelihood through policy interventions. It may be mentioned that availability of food would not solve the problem of hunger unless people have enough money to buy food.

According to the Economic Survey 2007-08, foodgrains production grew at the annual rate of 2.5 per cent between 1950-51 and 2006-07, slightly higher than the 2.1 percent population growth rate. However, during 1990-2007, the foodgrain production grew only by 1.2 per cent per annum while population increased by 1.9 per cent per year. Consequently, per capita annual consumption of cereals declined from a peak of about 171 kilograms in 1990-91 to 150 kilograms in 2005-06, indicating a decline of over 13 per cent during this period. The consumption of pulses also declined from 15.33 kilograms to 12.05 kilograms per capita per year during the same period. The area under foodgrains has declined by 6 million hectares between 1990-91 and 2005-06. It is generally argued that as the consumption pattern of people is changing due to increase in per capita income, urbanization, convergence of food habits, and more availability of horticulture and livestock

products, food security should not be confined to the mere availability of foodgrains but to the overall availability of edibles including fruits, vegetables, dairy products, eggs, meat and fish. However, this argument does not make sense, as a high growth in these products may not necessarily help the common masses improve their nutritional security. The National Family Health Survey report (2005-06) shows that the percentage of anemic married women in the age group 15-49 has increased from 53.9 in 1998-99 to 58.2 in 2005-06 in rural areas and from 45.7 to 51.5 in urban area. Similarly, percentage of anemic children has also increased from 75.3 to 81.2 in rural areas and 70.8 to 72.7 in urban area between the same periods. This indicates that undernourishment among women and children has increased. In case of poor households, cereal consumption is the main source of calorie intake and pulses are the major source of protein. The decline in the per capita availability of cereals and pulses has increased food insecurity among them.

Keeping in view the growing population and rising food prices, making universal access to foodgrains and ensuring nutritional security of the people is one of the most difficult challenges before the policy makers, especially taking into consideration of slow growth in the area, production and yields of major food crops and rising food subsidy bill, and consequently the fiscal burden of the government. Moreover, as our past experiences show, there always remains possibility of exclusion of needy households and siphoning of the foodgrains by corrupt officials in nexus with the grain distributors. This article briefly reviews the proposed National Food Security Bill (NFSB) and examines some key issues related to the food security in India.

State of Hunger and Poverty in India

As per the World Bank estimates, 34% Indian people live on less than US\$1 a day (extreme

poor) and 80% live on less than US\$2 a day (moderate poor). NCEUS (2009) estimates both percentage of people below poverty line (Rs.12 per day per capita consumption in 2004-05) and percentage of people vulnerable to poverty (per capita consumption expenditure of Rs.20 per day in 2004-05). As per its estimate, about 77 percent people of the country are poor and vulnerable. This poor and vulnerable group constituted about 88% of SC/ST, 80% of OBCs and 85% of the Muslim population. Most of them are socially discriminated, educationally deprived and economically destitute. The IFPRI report on hunger published in 2009, ranks India at 65 out of 84 countries, slightly above Bangladesh and below all other South Asian countries. The intensity of hunger in the report is classified into five categories, namely, Low (values less than 4.9), Moderate (values 5.0-9.9), Serious (values 10.0- 19.9), Alarming (values 20.0- 29.9, and Extremely Alarming (values 30 or higher. India comes in the category of Alarming problem of hunger. Government of India launched various programmes for removing poverty, hunger and malnutrition, however, despite all these efforts, approximately 60 million children are underweight. Millions of people live with hunger due to lack of access to food. They are undernourished and malnourished as they cannot afford to buy enough nutritious food. National Family Health Survey-III (2005-06) shows that the nutritional status of rural and urban children in terms of weight-for-height has deteriorated over the preceding period. The survey also reveals that the percentage of malnutrition children is higher in rural areas than in urban areas.

Report of NSSO survey 2004-05 shows that the consumption of all types of cereals and pulses has declined in 2004-05 over 1999-00. In rural areas, the consumption of total cereals declined from 12.72 kg in 1999-00 to 12.12 kg in 2004-05,

while consumption of pulses declined from 0.84 kg to 0.67 kg during the same period. Similarly, in urban areas, the consumption of total cereals declined from 10.42 kg to 9.94 kg and pulses from 1.0 kg to 0.78 kg during the same period. In terms of expenditure also, the share of cereals in total food items has significantly declined. For instance, in rural areas, it went down from 40.99 percent in 1987-88 to 37.31 percent in 1999-00 and further to 31.59 percent in 2006-07. Similarly, in urban area, it has declined from 26.46 percent in 1987-88 to 25.70 percent in 1999-00 and further to 22.97 percent in 2006-07. However, the percentage share of expenditure on cereals is much higher in rural areas than in urban area. Non-cereals food expenditure in urban areas constituted about 77 percent of total expenditure on food items, while the corresponding percentage in rural areas was only 68.41.

Overview of Proposed National Food Security Bill

In recent years, the Government of India has taken several initiatives towards ensuring rights and entitlements of citizens of the country. Right to information, right to employment and right to food are the key initiatives in this context. Making universal access to food is now a hot topic of debate and discussion in various academic, political and public forums. To provide legal entitlement of access to food to the people of country, the National Advisory Council (NAC) prepared a draft of National Food Security Bill (NFSB). The NFSB proposes to provide legal guarantee to subsidized food grains to at least 75 percent of country population (90% rural and 50% urban). The households are classified into two categories—priority households (46% rural and 28% urban households) and general households (39% rural and 12% urban in Phase I and 44% rural and 22% urban in final phase). The priority households would be entitled to

have a 35 Kg foodgrains per month at Re1.00 per kg for millets, Rs.2.00 for wheat and Rs.3.00 for rice. The general households would have a monthly entitlement of 20 Kg at a price not exceeding 50% of the current MSP. The NFSB also proposes to reform of the existing Public Distribution System. The NAC estimates the requirement of 57.36 million tons (MT) and 63.59 MT of food grains and subsidy bill of Rs 71837 crores and Rs.79931crores in phase1 and final phase, respectively. Apart from ensuring public provisioning of access to food, the Bill also stress on revitalization of agriculture and food production; universal access to safe drinking water and sanitation; universal health care; universal access to crèche facilities; special nutrition support for persons with stigmatized and debilitating ailments; and provision of pensions for the aged, disabled, and single women.

In order to examine the implications of the NAC proposal, the Government of India constituted an Expert Committee (EC) headed by Dr. C. Rangarajan. After adjusting for population, the Expert Committee estimates the subsidy bill of Rs 85,584 for phase 1 and Rs 92,060 for final phase. The EC suggests two options. First option is that priority households may be entitled to get 7.00 kg per capita foodgrains and general households may be given 2.00 kg foodgrains per capita. Second option recommended by the EC is that needy households (BPL households + 10% of BPL households) be provided food grains at Rs 2 per Kg for wheat and Rs 3 per kg for rice and the rest be covered through an executive order with a varying quantum depending on the availability of food grains. Based on the second option, the EC estimates 50.96 MT in year 2011 and 51.93 MT in 2014. The EC recommends that the balance food grain of around 5 MT (for both phases) may be distributed to the non-entitled

population at an issue price equal to MSP. The EC fears that a larger procurement of food grains for this purpose may distort market prices and significantly increase the fiscal burden, especially with the future increase in MSP. Thus, the EC has diluted the NAC proposal on NFSB on the pretext of inadequate infrastructure of procurement, storage and management of huge stock of food grains; market distortion due to huge procurement and mounting fiscal deficit. In fact, the neo-liberal policy agenda of the government intends to encourage the corporate sector to involve in wholesales and retail food markets. The speculative and hoarding tendencies of the corporate sector coupled with growing role of futures market in the agricultural commodities may artificially create scarcity of food grains and push up their prices to earn exorbitant profits.

Role of Agriculture in Food Security

Improvement in agricultural production and productivity helps to ease the problem of food security in two ways: first, by making the food items affordable to the consumers, and second, by generating additional employment opportunities to rural workforce in farm and non-farm activities. In recent years, food prices have significantly increased, making food items unaffordable to poor households, and at the same times, agricultural income has not increased in commensurate with the increase in the cost of cultivation, consequently increasing distress among farmers. Relatively faster growth rate in tertiary and secondary sectors has been instrumental in creating mismatch between demand and supply of food items. Increasing energy prices have made agricultural production more expensive via raising the production and transportation costs. Therefore, the price stabilization should come through raising food production and productivity that require increased investment in agriculture, in addition to providing

incentives to farmers to grow more food. As land and water are scarce inputs and have competitive uses in agriculture well as in non-agricultural activities, future enhancement in the food grains production to meet out the rising demand can be possible through improving the resource-use efficiency and productivity. The National Food Security Mission has targeted to increase the production of rice, wheat and pulses by 10, 8 and 2 million tons by the end of the 11th Plan. The food grains production targets can be met by reducing gaps between actual and the potential yields through improved practices. India is in a position to increase production of wheat by about 40 per cent, and double paddy production by bridging the existing gap in the actual and potential crop yields. For instance, four States—Uttar Pradesh, Bihar, Madhya Pradesh and Rajasthan—together have potential of 25.04 million tons of additional wheat production.

Recent focus is on diversification of farming towards horticulture and livestock products. Can a high growth in the horticulture and livestock products help the poor masses improve their food security? Availability of food items in the market is one aspect related to food security and the other is accessibility of the food items to the poor households. If prices of food items increase faster than the income of poor households, they would not be able to have access to food even if the market has adequate supply of food items. In this context, agricultural diversification can help to increase the income of small and marginal farmers and agricultural labourers by creating more gainful employment. More employment opportunities could also be created through non-farm activities via multiplier effect. The

Problem of food security cannot be viewed only in terms of procurement and distribution of food; it should also be seen in the context of production of food grains, livelihood of people and overall management of food economy.

development of infrastructure in terms of roads, markets, storage, processing, land availability, technology advancement, and increase in human capital are the major supply side factors and urbanisation, income growth, convergence of food habits as demand-side factors in the agricultural diversification. The policy driven factors, such as input subsidy, reform in tenancy and lease laws, promotion of contract farming and incentives to food processing sector may also attract corporate investment in the hi-tech commercial crops.

As consumption patterns, especially of fast growing middle class households, are gradually shifting away from food grain to these crops, the future growth in agriculture would come from the growth of horticulture and livestock products. However, there are a number of problems related to diversification of farming. While India produces over 162 million tons of fruits and vegetables, the cold storage facilities exist only for 12% of total produce. This results in enormous loss due to wastage. Further, there exists a wide inter-state disparity in the availability of cold storage facilities. Three southern states—A P, Karnataka and Tamil Nadu, which together constitute 31.66% of total fruit production, 14.26% of vegetable production and 71.58% of flower production, have only 5.31% share in the total cold storage facility of the country. Another two states, namely Gujarat and Maharashtra, which comprise 28.42% of country's fruit production, possess only 7% of total storage capacity. Contrary to this, U P, West Bengal and Punjab together constitute about 71% of cold storage capacity of the country while their shares in total production of fruits, vegetables and flowers are only 12.83%, 36.06% and 7.56%, respectively.

It is relevant to note that agricultural diversification and rising energy prices have significant implications for food security of common masses. A high growth in horticulture and livestock products may not improve nutritional status of the common masses as they have little or no access to fruits and livestock products due to their high prices. Cereal consumption among poor is the main source of calorie intake and pulses are the major source of protein, a decline in the per capita availability of cereals and pulses due to diversification may increase food insecurity among them. Secondly, increasing consumption of highly income-elastic food products, such as, meat and dairy products have also increased the demand for cereals for feed-grains and thus increasing the cereals prices, affecting the poor households. For instance, production of one kilogram of meat requires more quantity of grains than that is required when it is directly consumed by a consumer. Thus, if more quantity of grains is diverted towards production of meat and dairy products, less quantity would be available for common masses for direct consumption. Hence, appropriate output-mix is necessary to strike a right balance between “wage goods” and “high value goods” for the point of view of food security.

Energy prices affects the food prices in two ways: First, rising prices of petroleum products motivates the government and corporate sector to go for producing bio-fuels. For instance, about 20 percent of maize production in the US is being used to produce ethanol. In India also, the government has initiated policy to produce

bio-diesel from jatropha plants and ethanol from molasses. The increasing production of bio-fuel reduces the availability of food grains for consumption and thus raises the prices. Second, increasing energy prices make agricultural production more expensive via raising the cost of mechanical cultivation, inputs like fertilizers and pesticides, and transportation of inputs and outputs. The high cost of cultivation deters the farmers, especially small and marginal ones, to use modern farm practices and inputs required to augment food production.

Key Issues and Options

- One of the most critical issues before the policy maker is the decline in the aggregate

The IFPRI report on hunger published in 2009, ranks India at 65 out of 84 countries, slightly above Bangladesh and below all other South Asian countries. The intensity of hunger in the report is classified into five categories, namely, Low (values less than 4.9), Moderate (values 5.0-9.9), Serious (values 10.0- 19.9), Alarming (values 20.0- 29.9, and Extremely alarming (values 30 or higher).

areas under operational holdings from 165.51 million hectares in 1990–91 to 159.90 million hectare in 2000–01, a net decline of 5.61 million hectares. This trend, if not arrested, may adversely affect food, employment, and income securities, as per hectare productivity of major crops have either decelerated or stagnated during the last one decade and scope

of bringing more land under cultivation is limited. Therefore, a suitable national policy is required in context of using agricultural land for non-agricultural purposes.

- Improve the productivity and profitability in agriculture through enhancing public investment in agricultural infrastructure, R&D, extension, irrigation and water management, market, post-harvest technology, storage and distribution.

- About 55 per cent of consumers of the country draw their livelihood directly from agriculture as cultivators and agricultural labour. Moreover, rural non-farm workers, such as rural artisans, rural service providers, etc., also depend on the growth in farmers' income. Furthermore, 82 per cent of total farmers' households are having size of land holdings less than two hectares and many of them are net buyers of some essential agricultural commodities. Increase in agricultural productivity would improve their livelihood and consequently affordability of food items.
- Develop such a supply chain system for agricultural products that benefits both farmers and consumers. High market prices of agricultural commodities paid by the consumer do not always benefit the farmers due to inefficient supply chain system. Therefore, effective linkage between farmers groups and consumers groups need to be established to eliminate the multi layers of intermediaries between farmers and consumers.
- Due to inadequate post-harvest infrastructure, about 10 per cent of the food grain produce (about 20 million tonnes) go on waste every year. Saving of 20 million tonnes of food grains through efficient supply chain management and creating better storage and distribution infrastructure can help to release about 6 million hectares of land under food grain cultivation for other remunerative crops or can produce additional 20 million tonnes of food grain.
- Groundwater recharge and rainwater harvesting must be given priority in the groundwater depleting regions. Farmers should be provided subsidies to built tank/

pond in their land holdings for aquifer recharging. This is more desirable in the rain-fed and dry regions that constitute about three-fifth of total cultivated area.

- The main cause of farmers' problem is that the income earn from farming is not adequate to meet out their consumption needs mainly due to adverse terms of trade, low yield and high dependence of rural workforce on agriculture. These issues should be properly tackled through suitable policy actions.

Summing up

Food security is not less than the national security. It needs to be given top priority in the national planning. We cannot depend on imports for maintaining food security and mitigating food inflation. If India decides to enter in the world market as a bulk importer of food, international prices would increase sharply, thus jeopardizing our food security. Further, if procurement, distribution, trade and management of agricultural commodities are concentrated in the hands of big agri-business companies, they can follow speculative and hoarding practices and create volatility in the market. Therefore, the government policy should be oriented towards removing the supply-side and demand-side bottlenecks of the food economy. Use of information technology could help significantly in this regard. Development of on-line trading system, which effectively links the agricultural markets through computer network, would help in narrowing down the gap between consumers' prices and producers' prices.

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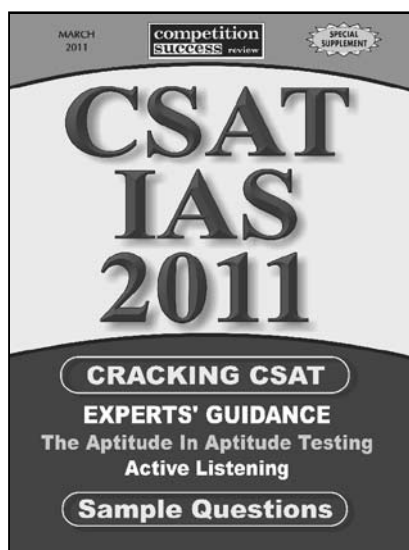
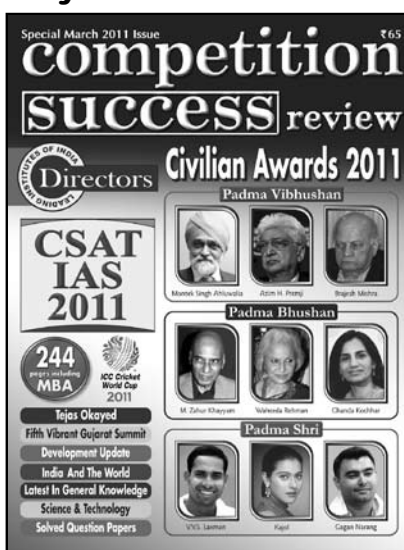
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Draft National Food Security Bill: Essential Features

As agreed by the National Advisory Council at its meeting on July 14th, 2010, a Working Group of Members of the NAC was constituted on the National Food Security Bill. After due deliberations and wide ranging consultations, the NAC finalized the details of the basic framework of the proposed National Food Security Bill at its meeting held on 23 October, 2010.

Based on the recommendations already communicated to the Government, as a first step towards preparing the draft National Food Security Bill, a detailed Framework Note has now been prepared by the Working Group. This Framework Note was considered in the meeting

of the NAC on 21 January, 2011 and it was decided to put this Framework Note in the public domain, inviting comments, before the Draft Bill is taken up for consideration by the NAC.

The draft Bill is in two parts. The first part deals with *food entitlements* and their operational framework. These entitlements are to be realised through specific *food-related schemes* (listed in Schedule I), implemented by state and local governments with support from the Central Government. The second part develops a framework of *grievance redressal for food-related schemes*, with potential for being extended to other economic and social rights.



Food Entitlements and Related Matters

Essential Entitlements

This part is based on the NAC note of 23rd October 2010. The essential entitlements are:

Public distribution system: 35 kgs per household per month at Rs 3/2/1 for rice/wheat/millets for Priority category; 20 kgs at (at most) half of MSP for General category.

Maternal and child support: (1) Universalization of ICDS (as per Supreme Court orders); (2) counselling and support for optimal Infant and Young Child Feeding; (3) nutrition take-home rations for children under 3 and pregnant/lactating women; (4) cooked midday meals up to Class 8 in government and government-aided schools; (5) maternity entitlements of Rs 1000/month for 6 months for pregnant women.

Special groups: (1) Daily, free cooked meal for destitute persons; (2) Portable entitlements for migrants; (3) Community kitchens (subject to successful pilots) for homeless persons and the urban poor; (4) Emergency relief for disaster-affected persons; (5) unconditional protection from starvation.

Note: The PDS entitlements shall not be reduced in any manner until at least the end of the 12th Five Year Plan period. Other entitlements cannot be reduced except by amendment of the Act.

PDS Reform

The reformed PDS is to have a transparent structure, where food transfers can be tracked all the way to the cardholders and Fair Price Shops are managed by accountable community institutions.

The Act will mandate extensive PDS reforms, such as: decentralised procurement; community management of Fair Price Shops; doorstep delivery to FPSs; assured financial

viability of FPSs; strict transparency safeguards; end-to-end computerization; tamper-proof receipts; regular social audits. The Act will also create space for innovative uses of ICT.

Enabling Provisions

Enabling provisions call on the central, state and local governments to strive towards progressive realization of (inter alia): (1) revitalization of agriculture and food production; (2) universal access to safe drinking water and sanitation; (3) universal health care; (4) universal access to crèche facilities; (5) special nutrition support for persons with stigmatised and debilitating ailments; (6) provision of pensions for the aged, disabled, and single women.

Grievance Redressal

Essential Provisions

The draft Bill attempts to build a strong system of grievance redressal for all food-related schemes, to ensure that food entitlements are realised. Grievance redressal provisions include:

- 1 Strict *transparency standards* for all food-related schemes.
- 2 Swift *fin*es for any violation of the Act.
- 3 “*Duty to fine*” whenever irregularities are found.
- 4 Principle of “*vicarious responsibility*”.
- 5 *Compensation* in the event of any loss of entitlement.

Institutional Setup

All food-related schemes will come under a common grievance redressal framework, involving:

- (1) Block-level **facilitation centres**: A non-official person or group appointed to help people with filing complaints, submitting appeals, resolving disputes, etc.
- (2) District **Grievance Redressal Officers**: See below.

- (3) State- and national-level **Food and Nutrition Commissions**: These will hear appeals, monitor the enforcement of the Act, and advise governments on food-related schemes. District Grievance redressal proceeds in 3 steps: (1) internal redressal (within concerned departments); (2) intervention of the District Grievance Redressal Officer; (3) appeal to state or national Commission.

Grievance Redressal Officers

The linchpin of the grievance redressal system is the District Grievance Redressal Officer (DGRO) at the District level. The DGRO is envisaged as an independent officer with extensive powers to investigate, fine and compensate. DGROs are to be recruited through an objective national selection process (possibly entrusted to the UPSC), with a non-extendable term of five years.

Transparency Standards

All food-related schemes will have to meet

common minimum standards of transparency. These include: (1) All information in the public domain; (2) Pro-active disclosure of essential information; (3) Web-based MIS with conversion to Janata Information System at the village level; (4) "Open office, open inspection, open records" regime; (5) mandatory social audits; (6) mandatory provision of individual transaction records (e.g. ration cards) to all beneficiaries; (7) right to information within 15 days at no more than photocopying cost. At least 1% of the cost of food-related schemes will be ear-marked for transparency measures.

Wider significance of this grievance redressal system

Over time, the proposed grievance redressal system could possibly be extended to other similar legislations such as NREGA and Right to Education Act. This would be a major breakthrough.

(Source: National Advisory Council website.)

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Food Security In India: Policy Issues & Challenges

Dr. K. K. Tripathy & K. C. Mishra

Though India is one of the largest producers of the food in the world, yet nearly 300 million people struggle for meeting two square meals a day and 21 per cent of the national population (230 million) are malnourished . This indicates the issues of accessibility to adequate and nutritive food to the poor.

The euphoria of green revolution and related measures started fading with time and there has been a progressive decline in public investment in agriculture during 1960 and 2009. There have been challenges and gaps in tackling the problem of poverty and hunger across the States in the country. Although India has been able to eradicate famine or has reduced the risks of famine like situation through its Public Distribution System (PDS) network, the food sufficiency, quality and nutritive value

of food grains have now emerged as a considerable challenge along with the related issues of poverty and nutrition. The debates are also on about the possible adverse impact of climate change over the years on the agriculture sector towards sustaining the agro produce. In this context, the planners, policy makers and researchers have been exploring ways and means to ensure food security to the country's millions of citizens.



The definitional jurisdiction of 'food security' comprises three inherent and important dimensions viz., availability, accessibility and stability of food articles. While availability of food is a function of production of foodgrains, the accessibility to food relies on the State's food policy coupled with the purchasing power of the consumer. The third dimension is 'stabilization' which is influenced by the sustainability of the food system. To a large extent, the sustainability of a food system minimizes the probability of risks related to food insecurity in normal as well as difficult times by ensuring the food consumption at a required level.

Though India is one of the largest producers of the food in the world, yet nearly 300 million people struggle for meeting two square meals a day and 21 per cent of the national population (230 million) are malnourished (www.ifpri.org/india International Food Policy Research Institute, 2011). This indicates the issues of accessibility to adequate and nutritive food to the poor. Further, it is well documented that most poor families in the world spend 80 per cent of their total income on food grains and insufficient purchasing power deprives them from accessing food in right quantity. In this backdrop, an attempt is made to assess the trends in the foodgrain production, yield and availability and examine the efficacy of food based security net of the government

towards achieving its objective of universal food and nutritional security.

PRODUCTION, YIELD

The trend in the area, production, yield and irrigation coverage under foodgrains during 1952-53 to 2009-10 is described in Table 1. During 1952-53, 102.09 million hectares were covered under foodgrain. The total foodgrain production achieved in 1952-53 was 59.2 million tonnes with a per hectare yield of 580 kilograms/hectare. Between 1952-53 and 2009-10 only 19.28 million hectares were added to the existing area under foodgrain cultivation. However, due to the impact of green revolution and the use of modern agro services, the total production increased from 59.20 million tonnes in 1952-53 to 218.20 million tonnes in 2009-10 and yield increased from 580 kilograms/hectare to 1,798 kilograms/hectare in the intervening period. While 18.1 per cent area under foodgrains had assured irrigation in 1952-53, the irrigation coverage increased to 46.8 per cent by 2007-08. Table 1 also indicates that since 2003-04, the area under foodgrain has remained more or less stagnant with a relatively stagnated yield rate.

The rate of growth in areas under rice cultivation was 0.7 per cent during the period 1990-91 to 1999-00. The area under wheat

Table 1 : Area, Production, Yield and Irrigation Coverage under Foodgrains in India

Year	Area (Million Hectares)	Production (Million Tonnes)	Yield (Kg/Hectare)	% Coverage under Irrigation
1	2	3	4	5
1952-53	102.09	59.20	580	18.1
1962-63	117.84	80.15	680	19.8
1972-73	119.28	97.03	813	25.4
1982-83	125.10	129.52	1035	30.8
1992-93	123.15	179.48	1457	37.4
2002-03	113.86	174.77	1535	42.8
2003-04	123.45	213.19	1727	42.2
2004-05	120.00	198.36	1652	44.2
2005-06	121.60	208.60	1715	45.5
2006-07	123.71	217.28	1756	46.3
2007-08	124.07	230.78	1860	46.8
2008-09	122.83	234.47	1909	NA
2009-10	121.37	218.20	1798	NA

NA: Not Available

Sources: (a) Ministry of Agriculture, GoI, 2008 and 2010 & (b) Economic Survey, GoI 2009-10

Table 2:Rate of Growth of Area, Production and Yield for Foodgrains during 1990-91 and 1999-00 and 2000-01 and 2007-08 (in per cent)

Crops	1990-91 to 1999-00			2000-01 to 2007-08		
	Area	Production	Yield	Area	Production	Yield
1	2	3	4	5	6	7
Rice	0.7	2.0	1.3	-0.1	1.9	2.0
Wheat	1.7	3.6	1.8	1.3	1.4	0.1
Pulses	-0.6	0.6	0.9	1.9	3.4	1.7

Sources: (a) Ministry of Agriculture, GoI, 2008 and (b) Economic Survey, GoI, 2008-09

registered a growth rate of 1.7 per cent while pulses marked a negative growth rate in areas by -0.6 per cent during the same period (Table 2). An analysis of the production and yield growth of food crops under irrigation between 1990-91 to 1999-2000 and 2000-01 to 2007-08 indicates that the rice production between 1990-91 and 1999-00 has recorded an annual growth of 2 per cent vis-à-vis a growth rate of 1.9 per cent between 2000-01 and 2007-08. The rate of growth of production of wheat and pulses during 1990-94 to 1999-2000 was 3.6 per cent and 1.4 per cent, respectively, and 0.6 per cent and 3.4 per cent, respectively during 2000-01 to 2007-08. A comparison of the growth registered in the area under major crops, their yield and production and the growth in the area during 1990-91 to 1999-00 and 2000-01 to 2007-08 paints a grim picture in maintaining the soaring staple food demand in the backdrop of the country's burgeoning population growth.

In the absence of a continuous follow up to the green revolution of 1960s and the dearth of a suitable technological breakthrough in Indian agriculture in the post-green revolution era, there has been a continuous decline in the total factor productivity of Indian agriculture. Annual rate of growth in GDP in agricultural and allied production reduced from 4.9 per

cent in 2007-08 to 1.6 per cent in 2008-09. The Central Statistical Organisation (CSO) had estimated agricultural growth at an annual rate of 0.2 per cent during 2009-10 (GoI, 2010). The volatility in the growth in the agriculture sector has posed a real challenge in ensuring food security for all.

AVAILABILITY AND PRICE MOVEMENT

The availability of per day per capita foodgrains since independence is indicated in Table 3. The per capita availability of foodgrains was estimated to be 384.5 grams in 1952-53. The net per capita availability witnessed an upward trend till 1972-73. Thereafter, the trend did not have a specific pattern. One can see a fluctuation in the per capita availability of the foodgrains since 1972-73 till 2008-09. During 2008-09, the per capita foodgrain availability was 436 grams which was 30.1 grams less than that of in 1972-73. The per capita availability of cereals went down from 458.7 grams per day during 2002-03 to 374.6 grams during 2008-09. However, the per capita per day availability of pulses increased from 35.4 grams during 2002-03 to 41.8 grams during 2008-09. The per capita per day availability of pulses has reduced drastically by 29.5 per cent from 59.1 grams during 1952-53 to 41.8 grams during 2008-09.

Table 3: Population and Per capita per day net availability of food grains

Year	Population (in Million)	Per capita net availability per day (in grams)		
		Cereals	Pulses	Total
1	2	3	4	5
1952-53	369.2	325.4	59.1	384.5
1962-63	452.2	398.9	62.2	460.9
1972-73	563.9	419.1	47.0	466.1
1982-83	703.8	415.6	39.2	454.8
1992-93	867.8	434.5	34.3	468.8
2002-03	1,050.6	458.7	35.4	494.1
2003-04	1,068.2	408.5	29.1	437.6
2004-05	1,085.6	426.9	35.8	462.7
2005-06	1,102.8	390.9	31.5	422.4
2006-07	1,119.8	412.8	32.5	445.3
2007-08	1,136.5	407.4	35.5	442.8
2008-09	1,153.1	374.6	41.8	436.0

Source: Economic Survey, GoI 2008-09 & 2009-10

The pattern in the availability of food grains (Table 3) indicates that the six decades of economic planning has not been successful in ensuring sustainable foodgrain availability either through its production and pricing policy or through its initiatives launched towards fair distribution of food grains to the vulnerable poor in the country.

The affordability dimension of food security is influenced by the price movement of foodgrains in the country. The food inflation based on Wholesale Price Index (WPI) at 1993-94 prices during 1994-95 to 2009-10 indicates that the growth in the net availability of the foodgrains have not been able to influence the demand for

Table 4: Trend in WPI of Foodgrains at 1993-94 base prices (1994-95 to 2009-10)

Year	All Commodities (100.00)	Food Articles (15.40)	Food Grains (5.01)	Cereals (4.40)	Pulses (0.60)
1	2	3	4	5	6
1994-1995	112.6	112.8	114.7	113.6	122.2
1996-1997	127.2	137.3	137.6	135.7	151.3
1998-1999	140.7	159.4	152.0	150.9	160.1
2000-2001	155.7	170.5	173.8	173.0	179.6
2002-2003	166.8	179.2	174.3	173.5	180.6
2004-2005	187.3	186.3	177.5	177.9	174.4
2006-2007	206.2	210.5	206.0	199.4	254.2
2008-2009	233.9	239.8	234.1	230.5	259.8
2009-2010	242.9	275.1	270.6	261.9	333.8

Note: Figures in the parentheses are respective weights.

Source: WPI estimates of Govt. of India, Ministry of Commerce & Industry (Available at: <http://www.eaindustry.nic.in/>)

the foodgrains as the same foodgrains over the years have become unaffordable (Table 4). This upward price movement in foodgrains will pose a serious challenge to the food security in India.

PDS Supplies and Off-take

The PDS is the main plank of India's food management initiatives. The food management aims at procuring foodgrains from farmers at remunerative prices, distributing foodgrains to consumers, particularly, the poor and the vulnerable sections of society, at affordable prices and maintaining food buffers for food security and price stability. National Sample Survey on PDS and other Sources of Household Consumption 2004-05 has indicated that at the all India level 81 per cent of rural households and 67 per cent of urban households have held ration cards (NSSO, 2007). An analysis of the percentage distribution of households by ration card in 17

major States of India (Table 5) highlights that Below Poverty Line (BPL) cards were held by 26.5 per cent of rural households and 10.5 per cent of urban households. Antyodaya card holders (the ultra poor) formed less than 3 per cent of rural households and less than 1 per cent of urban households.

Poverty and food and nutrition security are intricately linked. Recently, Government of India (GoI)'s two Expert Committees (Saxena Committee of the Ministry of Rural Development and the Tendulkar Committee of Planning Commission) have examined the existing poverty figures and their estimation methodology and recommended revision of existing poverty figures upwards (GoI, 2010). Thus, if the recommendations of these committees are accepted, then there will be an automatic expansion in the coverage of the PDS and other Government schemes where beneficiaries

Table 5: Percentage Distribution of Households by Ration Card Type in Major States: 2004-05 (in per cent)

State	Rural		Urban	
	Antyodaya	BPL	Antyodaya	BPL
1	2	3	4	5
Andhra Pradesh	2.8	54.0	1.5	26.6
Assam	0.6	12.0	0.2	3.2
Bihar	2.3	15.0	0.8	4.7
Chhatisgarh	4.4	35.0	2.1	15.2
Gujarat	0.8	36.0	0.1	8.4
Haryana	2.6	16.0	1.5	9.9
Jharkhand	3.0	23.0	0.8	7.5
Karnataka	9.6	42.0	2.0	14.4
Kerala	1.8	28.0	0.9	19.8
Madhya Pradesh	3.3	31.0	1.9	12.7
Maharashtra	4.4	31.0	0.3	8.0
Orissa	2.0	42.0	1.3	11.8
Punjab	0.1	12.0	0.0	3.9
Rajasthan	2.8	16.0	0.6	2.4
Tamil Nadu	1.5	19.0	0.6	12.8
Uttar Pradesh	2.8	14.0	0.7	7.2
West Bengal	3.2	27.0	0.8	8.8
India	2.9	26.5	0.8	10.5

Source: NSS Report No. 510, 2004-05

are decided on BPL basis. Further, the National Advisory Council has suggested promulgation of a National Food Security Act (NFSA) wherein legal entitlement to subsidized foodgrains to 75 per cent of the country's population covering 90 per cent in rural areas and 50 per cent on urban areas would be guaranteed.

The prime instruments used in the PDS are the Minimum Support Price (MSP) and Central Issue Price (CIP). Food Corporation of India (FCI) carries out the procurement, distribution and storage of foodgrains. While the procurement of foodgrains is open-ended, its distribution is regulated by the scale of allocation and its off-take by the consumers. The off-take of foodgrains is primarily under the Targeted Public Distribution System (TPDS) and for other welfare schemes of the Gol viz., Antyodaya Anna Yojana (AAY), Mid-Day Meal Scheme (MDMS), Wheat Based Nutrition Programme, Welfare programmes for SC/ST/OBC institutions, Annapurna Scheme, Food for Work Programme,

village grain bank scheme etc. TPDS draws the major share of foodgrain for distribution in the country. The off-take of foodgrains under the TPDS has gone up from 29.7 million tonnes in 2004-05 to 34.8 million tonnes in 2008-09 (Gol, 2010). However, the off-take has not been commensurate with the allocation made for TPDS (Table 6).

The slump in the demand for PDS foodgrains vis-à-vis allocation may be due to the abnormal increase in the procurement price and the consequent upward revisions in the central issue prices. The upward revision of issue price has reduced the difference between the issue price and open market price. Moreover, by paying issue price, the consumer will have to accept whatever the quality of wheat and rice sold at fair price shops of PDS. But in the open market he has the leverage to decide his purchase depending on the quality of the foodgrains in the open market sales. The rise in the support price has also an important impact

The National Advisory Council has suggested promulgation of a National Food Security Act (NFSA) wherein legal entitlement to subsidized foodgrains to 75 per cent of the country's population covering 90 per cent in rural areas and 50 per cent on urban areas would be guaranteed.

Table 6: Trend in the PDS Off-take of Wheat and Rice vis-à-vis Allotment from FCI (in per cent)

Year	Wheat				Rice			
	TPDS	AAY	MDMS	Annapurna	TPDS	AAY	MDMS	Annapurna
1	2	3	4	5	6	7	8	9
2004-05	29.6	66.5	103.9	88.3	39.4	74.5	81.1	71.1
2005-06	35.0	79.0	76.9	90.9	36.0	70.7	76.8	76.7
2006-07	70.1	90.1	79.9	37.7	36.7	71.7	75.8	67.8
2007-08	89.1	90.7	83.3	39.0	64.1	73.3	77.9	76.1
2008-09	67.4	66.7	91.4	40.3	25.3	68.8	73.6	69.6
2009-10	65.3	73.5	91.0	82.4	65.6	64.8	81.2	90.2

Source: Food Corporation of India, 2011

on the food procurement by FCI as it had to buy more foodgrains than it could manage since the off-take from PDS has declined due to upward revision of the issue price. This has also led to the increment of buffer stocks much beyond the recommended stock in a given year. The uneconomical rise in the stock of foodgrains with FCI has given rise to the overall economic cost of foodgrains to FCI and has had an adverse impact on the efficacy of the food based safety nets in India (Radhakrishna, 2005)

CONCLUSION

The increment in the cereal production has not been in commensurate with the per capita availability of foodgrains. While the agricultural productivity and yield have been relatively stagnant, the abnormal increases in the minimum support and procurement prices have caused an upward price movement in the foodgrain sector. The foodgrain prices have now gone beyond the purchasing power of the common consumers and facilitated diversion of foodgrain from market to government warehouses and have added to the overall economic cost of procuring and carrying the foodgrains for public distribution.

Considering the enhancement in the benchmarked poverty line, variation in the availability of foodgrains, restricted inter-State movement of foodgrains and price volatility, productivity growth and a sound price management in the food sector have become necessary. The right to food and food security initiative will require an enhancement in procurement and distribution of foodgrains. While these steps are appreciated, yet the government needs to examine carefully the economic feasibility of rolling out the universal entitlement of foodgrain scheme under the proposed NFSA. Legal universal entitlement of

heavily subsidized foodgrains would also mean the enhancement in procurement of foodgrains through FCI and consequent upward revision in the minimum support price. Further, the shift in the consumption pattern of the consumers from cereals to non-cereals needs to be examined to identify the issues and challenges in the demand side factors. Otherwise, the government intervention in the supply side management may not only cause market distortions in the domestic economy but may also impact the overall export competitiveness of Indian foodgrains.

The Government needs to think of conducting a continuous and thorough research to track the demand and supply of foodgrains traded in the market. This would ensure future forecast on food prices and would facilitate

the Government in policy making. Universalisation of foodgrain distribution needs an alternative clean and transparent PDS mechanism other than through the FCI at the national level and Fair Price Shops at the grass-root

level. This calls for framing suitable operational policies for FCI to rationalize its buffer stocks, gradually unload excessive inventory of cereals and strengthening of the existing PDS by bringing in transparency and accountability at the ultimate distribution point. This initiative will improve supply situation and prevent price rise. Thus, while the proposed NFSA will address the supply driven distribution side of the foodgrains, the country needs to devise an appropriate strategy of food management keeping in view the overall demand and supply situation.

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The right to food and food security initiative will require an enhancement in procurement and distribution of foodgrains.

Exploring The 'Starving' India

Anupam Hazra

Food insecurity in rural India is primarily a reflection of rural poverty, and thus overall economic growth and its distributional pattern cannot but be important in solving the hunger problem.

Food security of a nation is ensured if all of its citizens have enough nutritious food available, all persons have the capacity to buy food of acceptable quality and there is no barrier on access to food. After sixty three years of independence, it gives me a feeling of exasperation to write about lack of food or food insecurity as a pertinent issue - an issue which seems to have a perennial root in the wet roots of Indian development journey.

Food Security: The Current Scenario

The state of India's food security is worsening by the year. There is no doubt that India is facing food crisis – which is reflecting from India's position in the latest global hunger index, released in 2010. In the 2009 Global Hunger

Index, India ranked 65 out of 88 countries, and slipped down to 67th position, in 2010. Even countries like Pakistan and China have been ranked way ahead of India. The index rated 84 countries on the basis of three leading indicators - prevalence of child malnutrition, rate of child mortality, and the proportion of people who are calorie deficient. 230 million people in India are undernourished — the highest for any country in the world. Malnutrition accounts for nearly 50% of child deaths in India as every third adult (aged 15-49 years) is reported to be thin (Body Mass Index less than 18.5). According to the latest report on the state of food insecurity in rural India, more than 1.5 million children are at risk of becoming malnourished because of rising global food prices. *The food insecurity is so*



rampant across the country that India has been clubbed with minor economies like Bangladesh, Timor-Leste and Yemen, recording the highest prevalence of underweight children under five. As per UNICEF recent estimate - India is home to 42 percent of the world's underweight children and 31 percent of its stunted children. Against the popular perception among slogans like 'India rising' and 'Incredible India', India's condition is not much better than that of the dark continent, Africa or specifically Sub Saharan Africa as far as the issue of food security is concerned.

Food Security: The Recent Initiatives

For tackling this challenge to ensure food for all, currently the government has been implementing some major programs like the Public Food Distribution System (PDS), the Integrated Child Development System (ICDS), and 100 day-employment guarantee system under the National Rural Employment Guarantee Act (NREGA), Antyodaya Anna Yojana (AAY). Apart from these four major programmes - the government is implementing the Mid-day Meal Scheme for ensuring food security for the school children in particular. But these programmes did not turn out as expected with allegations that the food grains sold in PDS are of sub standard quality. With a view to enhance production of food grains to meet increasing demand on account of burgeoning population, National Food Security Mission (NFSM), which is now operational in 467 districts of 17 States.

At the same time, an ambitious and revolutionary 'Food Security Bill' is being drafted by the newly set up National Advisory Council (NAC). In its recent meeting in the month of October in 2010 - it has suggested that legal entitlements to subsidised food grains be extended to at least 75 per cent of the population - 90 per cent in rural areas and 50 per cent in urban areas. Further, the 'priority households' (46 per cent in rural areas and 28 per cent in urban areas) should be entitled to 35 kg (equivalent to 7 kg per person) every month at a subsidised price of Re. 1 a kg for millets, Rs. 2 for wheat and Rs.3 for rice, with rural coverage adjusted State-wise based on the Planning Commission's 2004-05 poverty estimates. In its recent meeting held in the month

of October, the NAC has also suggested that the 'general households' comprising of 44 per cent in rural areas and 22 per cent in urban areas, should be entitled to get 20 kg (equivalent to 4 kg per person) every month at a price not exceeding 50 per cent of the existing Minimum Support Price for millets, wheat and rice.

Food Security: The Present Dynamics

The cost of food items is increasing rapidly, making them unaffordable to a majority of the people. Added to these woes is the short supply of pulses and edible oils, which forces the Central government to import them. A large section of people suffer from food and nutrition insecurity in India, the worst affected groups are landless or poor households in rural areas and people employed in ill paid occupations and casual labourers engaged in seasonal activities in the urban areas. The food insecure people are disproportionately large in some regions of the country, such as economically backward states with high incidence of poverty, tribal and remote areas, regions more prone to natural disasters etc. In fact, the states of Uttar Pradesh (eastern and south-eastern parts), Bihar, Jharkhand, Orissa, West Bengal, Chattisgarh, parts of Madhya Pradesh and Maharashtra account for largest number of food insecure people in the country. In this deplorable situation of food security - it is ironical to notice that chief minister Mayawati is still prioritizing on building her own statues while millions of people of UP are dying of starvation.

Food insecurity in rural India is primarily a reflection of rural poverty, and thus overall economic growth and its distributional pattern cannot but be important in solving the hunger problem. It is particularly critical to pay attention to employment opportunities, other ways of acquiring economic means, and also food prices, which influence people's ability to buy food, and thus affect the food entitlement they effectively enjoy. Beside that corruption exacerbates poverty in most of rural India. The money that the central or state government earmarks for poverty eradication is cleverly pocketed by politicians, corrupt government officials and some village leaders. On the other hand, there is a lot of food stored in the Food

Corporation of India (FCI) warehouses and they are not being distributed fast enough. FCI complains that a lot of food gets spoilt because they are not consumed fast enough. This means that a lot of food gets wasted before it reaches the plates of the common man.

Food Security: The Emerging Challenges

So it is quite evident that the challenge of ensuring food security lies in the distribution of food and in making them affordable to the poor, not in food production. What makes the task of distribution more daunting is the fact that India has the responsibility of feeding 1.2 billion people. So instead of insisting on improving the production, the government needs to improve the distribution of the food grain and at the same time should empower small-scale farmers rather than multinational corporations, to feed the population - as local food production drives food security. It will also reduce migration to urban slums by encouraging the development of community-based economies. By protecting farmers' land rights, incentivizing them to stay in business and encouraging consumers to source directly from the villages, the Indian government could reduce dependency on a public distribution system that is collapsing under its own weight; simultaneously, continued growth of agriculture is essential to meet the food and nutritional security requirements of the people and provide livelihood and income in rural areas. In order to tackle the root causes of hunger, governments should encourage increased investment in agriculture, expand safety nets and social assistance programmes, and enhance income-generating activities for the rural and urban poor.

We cannot blame anyone squarely for this current scenario of food crisis across the nation. Poverty, hunger, corruption, societal ills etc are all ills and form a part of one viscous huge cycle. Public discourse and action at the grass root level are the need of the hour. All these supported duly at both the state and central level will lead to the destruction of that viscous cycle. It is all about making the poor and hungry step on the economic ladder, momentarily forget about

climbing it. Political will and good governance need to translate into specific reform steps. We must come forward and work together to help the impoverished people in our country.

No More Hunger: Let us Hope for a Better Future

There is not a single day when we do not read or hear about the different dimensions of the food crisis, which India is witnessing for last few years. India promises to achieve the millennium development goals by 2015, but the promise seems futile when one looks at the latest Global Hunger Index of 2010. Persistent inequalities, ineffective delivery of public services, weak accountability systems and gaps in the implementation of pro-poor policies are the major hurdles in the progress. It seems India will find it difficult to get on the tracks of attaining goals like health, gender equality and environmental sustainability unless intensive national efforts are made by government and all sections of civil-society working in tandem. The national media is also, by and large ignorant of the fact and cover articles only on food festivals and restaurants, ignoring the state of hunger. India may be the second fastest growing economy in the world, happens to be the world's largest producer of milk and edible oils and the second largest producer of wheat and sugar - but it fares far worse than lesser economies when it comes to taking care of its malnourished children. It is very interesting to note that the most of the world's rich people hail from India and at the same time, most of the malnourished group of the world also belong to India. Food price inflation is one of the most critical economic problems in the country today, and the ability to control prices of food articles quickly and effectively is one of the main bases on which people will judge the performance of this Government which is on the verge of giving its people the realisation that eating is not a privilege but a basic human right, through the enactment of revolutionary and path-breaking "Right to food Act".

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MESSAGE

I am happy to learn that the Indian Coast Guard is celebrating its 34th Anniversary on February 1, 2011.

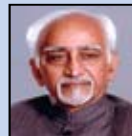
In the last three decades, the Indian Coast Guard has been serving the nation by ensuring its safety and security and protecting our long coastline and maritime boundaries. The personnel of the Coast Guard have always risen to the occasion to encounter the growing maritime challenges and respond to their call of duty with dedication and professionalism. I am sure that the Coast Guard will continue to pursue excellence, while discharging its duties.

I extend my greetings and felicitations to all ranks of the Indian Coast Guard, for their contribution towards national security and wish them and their families continued success in their future endeavours.

Pratibha Patil

(Pratibha Devisingh Patil)

New Delhi
January 14, 2011



VICE-PRESIDENT OF INDIA

MESSAGE

I am glad to know that the Indian Coast Guard is celebrating its 34th Anniversary on 1st February, 2011.

The Indian Coast Guard has grown into an efficient and spirited force. With professional expertise and dedication the Coast Guard have been at the forefront of guarding our maritime borders.

I extend my greetings and good wishes to all ranks of the Coast Guard and their families and wish the Anniversary celebrations all success.

M. Hamid Ansari

(M. HAMID ANSARI)

New Delhi
14th January 2011



MESSAGE

I am happy to note that the 34th Anniversary of Indian Coast Guard is being celebrated on 1st February, 2011.

Over the years, the Indian Coast Guard has emerged as a highly professional force, discharging its responsibilities in defending our maritime borders and in keeping the sea lanes of commerce open. With professional expertise and dedication the Coast Guard have been at the forefront of guarding our maritime borders. We are providing the Indian Coast Guard with resources and tools to fulfill its role. Significant progress in this regard has been made during the last two years. The material assets and manpower will transform the Indian Coast Guard into one of the finest non-military services in the Indian Ocean Region.

The achievements of the Coast Guard are a result of the dedication, devotion to duty and high level of professionalism of its personnel. I am sure the Indian Coast Guard will continue to discharge its duties with vigour and dedication.

I extend my greetings and good wishes to all personnel of the Indian Coast Guard and their families on this occasion.

Manmohan Singh

(Manmohan Singh)

New Delhi
21 January, 2011



34TH ANNIVERSARY
INDIAN COAST GUARD
COMMITTED TO SERVE



MESSAGE

the 34th Anniversary of the
celebrated on 1 February,

the Indian Coast Guard
professional force. Its
our maritime frontiers
of communication open
ed. We are committed to
Guard with the necessary
fulfill its role effectively.
s regard has been made
the materialization of these
transform the Indian Coast
est non-military maritime
n Region.

the Coast Guard reflect
duty and high standards
sonnel. I am confident that
continue to display verve
duties.

s and good wishes to all
st Guard and their families

Manmohan Singh
(Manmohan Singh)



MESSAGE

I am happy to learn that Indian Coast Guard is
celebrating its 34th anniversary on February 1, 2011.

Over the last three decades, the Coast Guard
has been evolving as an efficient and a balanced
force to meet the various maritime challenges. The
past two years have been particularly challenging,
requiring round-the-clock patrolling and surveillance
at sea. This speaks volumes of the dedication
and commitment of the officers and men of the
Coast Guard. With sustained efforts at improving
its infrastructure, the Coast Guard is on its way to
become one of the most potent peacetime forces
in the Indian Ocean Region. The force levels and
the manpower of the Indian Coast Guard are set to
substantially increase in the next few years.

On the occasion of the 34th Coast Guard Day,
I extend my best wishes to all the personnel of the
Indian Coast Guard and their family members.

I am sure that the Indian Coast Guard will
continue to serve the nation with all the honesty,
dedication and commitment. I wish the Indian Coast
Guard and its personnel, the very best in all the
endeavours.

Jai Hind

New Delhi
14 Jan 2011

(AK Antony)
(AK Antony)



MESSAGE

On 01 Feb 2011, the Indian Coast Guard completes 34 years
of dedicated and distinguished service to the nation, and I am indeed
privileged to be at the helm of such a fine service.

Over the past three decades, the Indian Coast Guard has matured
into a lean, professional and energetic force, undertaking with pride the
various roles for which it was raised. The past two years in particular,
have indeed been momentous for the Coast Guard. Significant progress
has been made on the acquisition, operational, infrastructure and human
resource fronts.

The successful achievement of many objectives and the
sustainment of intense operational activity during the last year is a tribute
to the hard work, professionalism and commitment displayed by every
officer, enrolled person and civilian of the Coast Guard. The ICG's quick,
professional and resolute response to oil spills, Search and Rescue
calls, anti - smuggling and anti - poaching inputs, and a host of other
contingencies have earned accolades both nationally and internationally.

Induction of ships and aircraft and capacity building in operational
infrastructure will continue to remain our thrust area in 2011. This calls
for hardwork, detailed planning, and will entail major administrative,
personnel and logistics challenges. I have, however, no doubt that these
challenges will be addressed and vanquished by the service.

In 2011, we must both consolidate the gains of the past two years,
whilst simultaneously continuing to scale greater heights, as befitting
a vigorous and professional service. I am certain that all Coast Guard
personnel will rise to the demands of this challenging era in the ICG's
history.

"VAYAM RAKSHAMAH"
"JAI HIND"

21 Jan 2011
New Delhi

(Anil Chopra)
(Anil Chopra)
Vice Admiral
Director General
Indian Coast Guard



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Food Security-Role of Gram Sabha Is Crucial

Awanish Somkuwar

The emerging food scenario underlines the role of Gram Sabha – the most powerful constitutional apparatus of democracy at the grassroots level. The Gram Sabha can act efficiently to allow the needy to exercise right to food.

India deserves commendation for realizing the food requirement of its swelling population. The farm sector has ably responded to the food security issue. Today India has achieved self-sufficiency in foodgrain production and is able to export the surplus. In spite of great strides in production of foodgrain, food insecurity and inequitable distribution of food continue to plague the country. The problem is not the production but impaired access to the food specifically by the most vulnerable groups.

India has witnessed green revolution and is readying for the second round of green revolution with newer farm technologies and innovations in farming systems. The farming community has demonstrated its coping capacity without letting down their performance despite a quite high frequency of crises in agriculture sector. Yet, many go hungry every day. Malnourishment among children keeps going high. What has gone wrong then? A close examination of persisting food security scenario underlines three major issues related to food security - Availability, Affordability and Access. These are inter-related. If food is available, can it be afforded by the needy families? If affordable, can it be easily accessed? The most important question is that who is not getting food and why? Of course the poor who are either geographically away from the food distribution points or do not have enough money to afford it.

India ranks 66 among 88 countries according to Global Hunger Index 2008 released by the

International Food Policy Research Institute. The Index has been developed on three main criteria – calorie deficiency, child malnutrition and child mortality. Over 200 million people in India have been reported to be unsure about accessing daily bread. The incidence of poverty amongst tribal communities persists challengingly. It simply means that either system has not reached out them or it is not working properly.

Problems and Limitations of PDS

The ultra poor families requiring access to food live in remote rural areas. Why should they live without food only because they live far away from distribution systems or mechanisms. The Targeted Public Distribution System is perhaps one of the biggest food distribution networks in the world considering geographical vastness. The State Governments have strived to improve the functioning of PDS but leakages continue for want of community ownership. Now the Centre is going to enact National Food Security Act. Again a radical step it is when seen in the background of National Rural Employment Guarantee Act. The National Food Security Act will ensure availability while facilitating affordability to the families devoid of resources, assets and deprived of opportunities. The PDS network will contribute greatly to effective implementation of the National Food Security Act. The limitation of the PDS is that it works mechanically. Those left in the process of targeting are not addressed. Many deserving families remain without ration card.

Gram Sabha and Food Security

The emerging food scenario underlines the role of Gram Sabha – the most powerful constitutional apparatus of democracy at the grassroots level. The Gram Sabha can act efficiently to allow the needy to exercise right to food. The most important aspect is that the Gram Sabha draws powers from the Constitution. Its decisions are unchallenged. The food security issue can be efficiently addressed by active and empowered Gram Sabha, which is expected to be in a leading role in implementation mechanisms of the proposed national food security act.

There are a number of reasons how and why Gram Sabha could bring about food security in the needy households. The scrutiny of Below Poverty Line families by the Gram Sabha and review the BPL list is the responsibility of Gram Sabha. The monitoring of functioning of fair price shops and making them accountable to the people are the two major tasks Gram Sabha can easily do. Besides, the needy can be helped to exercise their rights to food. The malfunctioning of fair price shops has often been reported. The Gram Sabha can keep a strict vigil over the fair price shops. The Right to Information is another tool to bring about transparency in stocks. Although, the Government of India has prescribed a system to involve Gram Sabha and Gram Panchayat in food distribution system but educating the Gram Sabha about responsibilities, rights and duties need to be taken up on a war footing. Verification of ration cards by the Gram Sabha and Gram Panchayat is possible with basic trainings either by voluntary sector or directly through state-sponsored training sessions.

The Gram Sabha Approach - MP Experience

Madhya Pradesh Rural Livelihoods Project – aided by Department for International Development United Kingdom is operative in 3000 remote villages in nine predominantly tribal districts – Dhar, Jhabua, Badwani, Aalirajpur, Sheopur, Mandla, Dindori, Anuppur and Shahdol. The Project has evolved a

Gram Sabha model for sustainable development of the rural poor. Primitive tribes like Baiga and Saharia and others like Gond, Bhil, Bhilala, constitute a sizeable population in these districts. The project is addressing livelihoods issues of tribal families through Gram Sabha, which takes collective decision of how money should go to the actual beneficiaries from Gram Kosh – grant or loan.

The targeted beneficiaries in Gram Sabha meetings tell the Gram Sabha how they should be helped. Thus they have been given privilege to express their choice of livelihoods activities. The Project stands as facilitator and gives technical advices and inputs on specific activities. This approach needs an active and sensitive Gram Sabha for good results. Therefore, strengthening of Gram Sabha on rights, duties and entitlements is one of the major tasks of the Project. Similar approach has been applied to address food insecurity. Thanks to the NREGA, that has reduced the food deficient days and migration to a great extent. The Gram Sabha meetings have prescribed a number of initiatives to resolve food security issues. Grain Banks have come up in a substantial number. Village Emergency Funds and Village Relief Funds managed and administered by the villagers have also been set up to meet financial requirement of the poor during crisis. No rate of interest is taken from the ultra poor.

Guided by the Project, the villages have done their poverty mapping through a comprehensive well-being ranking exercise. Consequently, each village has a list well-off, manageable, poor and the ultra-poor families. The ranking is based on moveable and immovable assets. Gram Sabha knows well the poor and the ultra poor families that face the food deficient days and therefore such families get priority in getting benefits under community-sponsored livelihoods initiatives. The BPL list does not serve the purpose many a time and the neediest families remain unlisted.

The author is State Coordinator – Communications, Madhya Pradesh Rural Livelihoods Project, Department of Panchayat and Rural Development, Bhopal, e-mail: awanishsomkuwar@gmail.com.]

Food For All: The Only Way Forward

Dr Amrit Patel

It is difficult to reduce hunger and poverty by half by 2015 as agreed under the United Nation's Millennium Development Goal No.1, which is a must for Sustainable Human Security and Peace. The Government launched in 2007 the National Food Security Mission to raise food output by 20 million tons during the Eleventh plan.

Already food prices in India have skyrocketed making lives of tens of millions miserable and threatening our food security. United Nations Food and Agriculture Organization has further warned stating that 'with the pressure on world prices of most commodities not abating the international community must remain vigilant against further supply shocks in 2011' India has, therefore, necessarily to enhance farm productivity to make food accessible to all under proposed Food Security Bill as recommended by either

National Advisory Council or by the Rangrajan Committee.

Food For All: Right to food is a *birthright for all* and should be an integral part of the right to life as enshrined in Article 21 of the Indian Constitution as well as Universal Declaration of Human Rights [1948]. Unless it gets enforced legally and socially, *hunger* will continue. In 1974, Food and Agriculture Organization [FAO] had declared that by 1984 " *no child, woman or man should go to bed hungry and no human being's*



physical or mental potential should be stunted by malnutrition”.

Gandhijee was one step ahead to emphasize that hunger should be overcome without eroding human dignity. He wanted every Indian to have an opportunity to earn his/her daily bread. However, seriously disadvantaged sections of our population like orphans, widows, old and infirm persons, pregnant women suffering from anaemia, children in the age group of zero to two belonging to poor families and those affected by leprosy, tuberculosis, HIV/AIDS need to be provided food free of cost.

Indian scenario: In India, the right to food campaign launched in 2001 focused its demand to address the structural roots of hunger since India's commitments to tackle the problem of hunger and malnutrition are among the worst. The National Family Health Survey [2006] showed that the child under-nutrition rate in India is 46%, which is almost double that of sub-Saharan Africa. In the Global Hunger Index [2008], India ranks 66 among 88 countries surveyed by the Washington-based International Food Policy Research Institute. India comes below Sudan, Nigeria and Cameroon.

Integrated Child Development Scheme has been under implementation since early 1970s, but still 45% of our children were malnourished and underweight. Today, hunger and deprivation affect about 260 million people in the country. India is a home to 40% of the world's underweight children and ranks 126 out of 177 countries in the UNDP Human Development Index. It is difficult to reduce hunger and poverty by half by 2015 as agreed under the United Nation's Millennium Development Goal No.1, which is a must for Sustainable Human Security and Peace. The Government launched in 2007 the *National Food Security Mission* to raise food output by 20 million tons during the Eleventh

plan. Dr Manmohan Singh, our Prime Minister announced in his Independence Day speech from the ramparts of the Red Fort that “*no body will be allowed to go hungry*” and Government is now proposing to legislate “*food as a right*”.

Price of Neglecting Agriculture: During 1960s and 1970s agriculture received significant momentum and witnessed Green Revolution but thereafter rate of growth of food grains in particular progressively declined from 2.73% in 1980s to 2.09% in 1990s and further to 2.01% in 2000-01 to 2007-08. Rate of growth of GDP in agriculture was 2.9% during 2000-08 as a whole. Annual growth rate in production of sugarcane and cotton during 2003-04 to 2007-08 was as high as 11.40% and 22.06% respectively as against miserably lower growth rate of rice [2.23%], wheat [2.35%], coarse cereals [2.06%], total food grains [2.05%] and total oilseeds [1.57%] during this period. India has per capita food grains availability of 176.3 kg a year as against the minimum required 182.5 kg, according to National Institute of Nutrition, whereas world's average is 358.4 kg a year. Decline and stagnation in agricultural terms of trade during 1990-91 to 2004-05 explains the declining financial viability of crop production and that the Government's ability to contain food prices in particular is fast eroding. Between 1960-61 and 2003, the number of holdings doubled from 51 million to 101 million, while the area operated declined from 133 million hectares to 108 million hectares resulting in a sharp decline in average size of holding and growing marginalization. Small and marginal farmers accounted for 85.9% in 2003 as against 61.7% in 1960-61. As many as 40% of the farmers interviewed by the NSSO wanted to quit farming if there was another option [iii] average total income of farm households with up to two hectares was less than 80% of their consumption expenditure.

On May 22, 2007 Prime Minister presented Report to the People [2004-07], which listed remedial measures to uplift agriculture. However, the performance of the agricultural sector during 2008-09 was rather bleak with a sudden drop in the growth rate just about 1.6% and the sector, which accounted for 21.7% of the GDP in 2003-04 sharply declined to 17.8% in 2007-08. Given the low rate of increase in farm productivity because of severe supply side constrained resources [land, water and farm power] the task of bringing about producers' prosperity is left to prices. With the agricultural growth rate barely exceeding 2.5% per annum in the last 10 years, the average per capita growth of income for the farm households is just above 1%.

Way Forward

Productivity: Despite India has the largest irrigated land and ranks second in terms of arable land the yield of most of the key agricultural products today is 20-40% of the world's best levels. This signifies that research on improving farm productivity and return on farm investments to significantly enhance farmer's prosperity is

a continuous process. India can increase wheat production by 30 million tones or around 40% and double paddy production at current levels of technology. This can be achieved by bridging the existing gap between the actual crop yields at field level and the potential yields. The State-wise percentage of yield gap between the production potential yield & actual yield at field level in case of wheat, rain-fed upland rice, rain-fed [shallow low land] Boro rice and irrigated rice is shown in Table.

Productivity of crops can be increased substantially by creating enabling environment; significant investment in infrastructure, establishing State of Art Agri-meteorology, expanding irrigation and reclamation of wastelands; strengthening research and extension and capacity-building of farmers to bridge the huge yield gap between the potential yields and actual yields at field level in rain-fed and irrigated farming systems; using genetically engineered seeds, micro-irrigation system, greenhouse technology, integrated nutrient and pest management technique, computer-based

Table 1
State-wise percentage of yield gap between the production potential yield & actual yield at field level

Wheat Crop	% Yield Gap	State	%Yield Gap	State	%Yield Gap
State		West Bengal	19.40	Jharkhand	105.30
Maharashtra	155.50	Punjab	6.10	Uttar Pradesh	67.20
Bihar	104.80	Paddy Crop		Irrigated Rice	
Himachal P	89.60	Rain-fed Upland		J & K	285.80
Madhya P	84.30	Chhatisgarh	157.00	Uttar Pradesh	222.40
Uttrakhand	80.50	Uttar Pradesh	86.40	Bihar	2220.10
Uttar Pradesh	50.50	Jharkhand	35.20	Gujarat	195.30
Gujarat	50.50	Rain-fed Shallow lowland		Chhatisgarh	169.40
Rajasthan	41.30	Assam	194.70	Uttarakhand	98.20
Haryana	19.80	Chhatisgarh	144.20		

modeling to track disease and pest incidence, farm mechanization, remote sensing technology and the like. Solution to minimize damage to livelihoods due to the recurring problems of floods, drought and cyclones should be sought by developing and using drought, flood and good weather codes as recommended by Dr Swaminathan. Agricultural Universities and ICAR institutes need to undertake this task from this year itself and intensify during the Twelfth Five Year Plan. National Commission on Farmers has made recommendations to find long-term solution to farmers' problems in rain-fed and drought-prone areas. Immediate need is to evaluate the effectiveness of the implementation of recommendations and commitments made in the Parliament in November 2007 in respect of the National Policy for Farmers, based on NCF's draft submitted in October 2006

The yield gap between the actual yield and the vast untapped yield reservoir existing in most farming systems need to be bridged by removing technological, economic and environmental constraints and efficiently using Rs.25,000 crore available under the Rashtriya Krishi Vikas Yojana both in irrigated and rain-fed areas.

The program of '50,000 Pulses and Oilseeds Villages' in rain-fed areas currently being funded out of 2010-11 budget should be implemented on a system approach linking the production, plant protection, procurement and consumption chain as envisaged under the Pulses and Oilseeds Mission of the 1980s.

The implementation of 'Pulses Villages'

scheme can arrest the rising cost of protein in the diet and help to end protein hunger. The multiplication and cultivation of outstanding varieties of chickpea, pigeon pea, moong, urad, and other pulses under the Pulses & Oilseeds Villages Program can significantly bridge the gap of about four million tons of pulses between the demand and supply. These crops require less irrigation water and now high value crops can also fix nitrogen in the soil. Cereal-legume rotation can build, replenish and maintain soil fertility. The Central and State agencies should procure pulses and crops like jowar, maize, bajra, ragi, and hill millets in order to diversify food basket.

Import of pulses and oilseeds, which was a temporary phenomenon, has become a permanent

As markets by themselves are unlikely to provide stable and reliable supplies of farm produce, support prices for agriculture have been continuing for decades in India and in most advanced countries.

feature. Instead importing, they need to be procured directly from farmers, more importantly small farmers, as is done for wheat and rice by paying higher support prices that can motivate farmers to raise pulses and oilseeds, the additional cost can be compensated by way

of transport and other incidental cost on import. This can successfully bridge the gap between the potential and actual yields being high in pulses, oilseeds sown in rain-fed areas. .

Support Prices: As markets by themselves are unlikely to provide stable and reliable supplies of farm produce support prices for agriculture, in one or the other forms, have been continuing for decades in India and in most advanced countries. The support price is an innovative marketing mechanism both for an assurance of price and to facilitate prompt payments to farmers at a predetermined price. Support prices are an

income security measure. In effect it motivates farmers to continue farming and not worry about prices.

The support prices should enable producers to make adequate investments in farm sector to boost productivity and make agriculture most competitive. The role of support prices has to improve profit margins of farmers so as to help them use capital-intensive yield-maximizing inputs as also they increase cash inflows, making new investments possible. This, therefore, calls for more research and innovations in the area of support pricing mechanism that can make farming a financially sustainable enterprise, rather than a way of life or subsistence farming. The National Commission on Farmers' recommendation on Minimum Support Price based on C-2 [total cost of production] plus 50% should at the first instance be implemented and there should be a continuous research in this area.

Storage: Future belongs to nations with grains. Since our farmers have to produce food for 1.2 billion human beings and over one billion farm animals by hard labor under scorching sun and torrential rains, it more than justifies that every grain produced is to be stored safely. The storage in order to make cost efficient and producer-consumer-friendly should preferably start in every village in the form of grain banks and rural godowns and extend to strategic locations throughout the country. According to the Food Ministry's annual report 2007-08, FCI has space to store grains to the extent of 217.41 lakh tons [129.48 lakh tons owned and 87.93

lakh tones hired] while Central Warehousing Corporation has space to store 193.42 lakh tons owned by it. In all, 509 lakh tons of grains can be stored with the aforesaid space Processing and storage facilities are required for our 250 million tons of food grains and 300 million tons of fruits and vegetables to reduce post-harvest losses and improve food safety. Food grains storage systems should be modernized to prevent insect & pest infestation. Prevailing mismatch between production and post-harvest technology should end. Safe storage, marketing and value addition to primary products have to be attended at the village level. A national grid of ultra-modern grain storage facilities must be created without further delay.

Chinese Storage System: In this case, China's system of food production, procurement, storage & handling is worth studying and emulating. The Chinese storage capacity has witnessed a quantum jump under the State Administration of Grains [SAG]. It employs state-of-the-art, multi-nodal [ship-to-track, rail, barge and ship-to-ship], automated

According to the Food Ministry's annual report 2007-08, FCI has space to store grains to the extent of 217.41 lakh tons [129.48 lakh tons owned and 87.93 lakh tones hired] while Central Warehousing Corporation has space to store 193.42 lakh tons owned by it.

grain transmission capable of handling 2000 tons per hour. The highly mechanized provincial granary in Guangzhou, with temperature-controlled and fumigated 100,000-ton storage, is a proof of China's intensive infrastructure upgradations, funded by taxes, World Bank assistance and trade surplus. The investment ranges from farm-based scientific storage to state-of-the-art standardization laboratories in Beijing. China has positioned a 176,000 trained & dedicated extension workforce in its grain-producing areas to educate farmers on storage practices. Granaries are effectively

managed at near full capacity and storage costs are built into cost of grain at the consumers' end. The system is facilitated by public sector operations in all the phases of farm-gate to home-gate grain movement.

China, in view of its high demand of food on account of double-digit growth, produces annually about 520 million tons of wheat & rice and continues to be supplemented by import arrangements. China annually procures and stores 150 to 200 million tons. It procures grain selectively from high productivity provinces and State prices are only available to provinces, which excel in productivity and not as a rule. Procured grain is cleaned, packed and marketed by about 3000 private sector companies, most of which have State support or party guidance, at market rates. Price control exists at procurement and wholesale points.

For managing the system it has the Chinese SAG, the State Grain Laboratories and the Grain Standards Organization, all located in Beijing. The system comprises the state-of-the-art commodity exchange in Dalian, the Beiliang Corporation handling logistics, the Guamano Grain Storage Engineering Company and the provincial storage godowns of Shanghai & Guangzhou

Processing: Adoption of efficient post-harvest technology can save farm produce from significant quantitative and qualitative losses. They are handled manually and roughly. Technology is important for extended storage of fruits and vegetables, rendering them fit for further processing. Fruits and vegetables after are kept open in the baskets where they deteriorate rapidly and most of them become

inedible too. They are often piled into the open carts, trailers or trucks directly even without proper cushioning and transported under high temperatures often exceeding 40°C. This should forthwith be replaced by cold chain systems. Practically all food units are engaged in primary processing, whereas the production base of secondary and tertiary processed foods is extremely low that's into low value-addition.

Manual processing has to be changed to large-scale use of technology like pre-cooling facilities for vegetables, controlled atmospheric storage and irradiation facilities. Our ability to enforce international food safety standards need be significantly improved in order to be competitive in domestic and international market against the serious concern of diseases. Required investment must be made to develop infrastructure for packing, cold storages, refrigerated transport systems, warehousing facilities etc.

Food chain clusters should be formed with the participation of all stakeholders such as farmers, seed growers, merchants, transporters, wholesalers, retailers, Rural Financial Institutions, and insurance companies. Information sharing is essential for generating efficiencies. We need to identify our niche strength and develop brands for those specific products.

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Adoption of efficient post-harvest technology can save farm produce from significant quantitative and qualitative losses. They are handled manually and roughly.

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Sharad

Role of Biodiversity in Food Security

Dr. Harender Raj Gautam

It is estimated that the Earth is home of approximately 240,000 species of plants of which only about 5,000 have been carefully studied. This diversity includes 1,500 food plants.

The United Nations designated 2010 as the International Year of Biodiversity aimed at raising public awareness about the threat to biodiversity from mankind and its impending consequences not only to human survival but also the survival of all the other species on the earth. The UN also proclaimed May 22 as the International Day for Biological Biodiversity to increase understanding and awareness of the biodiversity issues.

There are almost 3 million to 100 million species inhabiting the earth and out of these hardly 1,435,662 have been identified. It is estimated that the Earth is home of approximately

240,000 species of plants of which only about 5,000 have been carefully studied. This diversity includes 1,500 food plants. Based on plant-parts consumed, these genetic resources are represented by 375 species of fruits, 280 of vegetables, 80 of tuberous/root types, 60 each of edible flowers and seeds/nuts. Presently, mankind, by and large, is dependent on 25 to 30 food plants, viz., wheat, rice, maize, barley, oats, sorghum, millets, soybean, beans, pea, chickpea, peanut, banana, citrus, tomato, sugarcane, cassava, potato, sweet potato, yams, five oilseed crops and a few beverages and only three species viz. rice, wheat and maize provide 60 per cent food for the mankind.



Indian region is a major centre of domestication and diversity of crop plants. About 33 per cent of the cultivated plant species have their origin in this region. It is an important centre of origin and diversity of more than 20 major agri-horticultural crops including rice, beans, cotton, sugarcane, citrus, mango, banana, yams and several common vegetables and other popular species. Our country is also a homeland of 167 cultivated species and 329 wild relatives of crop plants. About 583 crops are cultivated here. It has about 30,000 to 50, 000 land races of rice pigeonpea, mango, turmeric, ginger, sugarcane, gooseberries etc. In addition, around 1000 wild edible plant species are exploited by native tribal people in different parts of the country. The species presently available are the product of long evolutionary process managing to survive ecological adaptations in the ever-changing environmental conditions over time and space. Evolution and extinction of biodiversity is a natural phenomenon. The earlier mass extinction of species were attributed to their inability to adapt to a changing environment but recent species losses are the direct result of changes resulting from human growth that have managed to disrupt and damage vital links in the sustainability of a species.

Species

Biodiversity has been under great threat for the last century due to bulldozing development initiatives of mankind. The destructive potential of mankind is ravaging and alarming. It is estimated that due to direct and indirect human actions, approximately 27,000 species become extinct every year. If this trend of biodiversity depletion continues, one-fourth of the world's species will be gone by the year 2050. Scientists have estimated that human activities are likely to eliminate approximately 10 million species by the middle of this century. While evolution of a new species or a new variety can take tens of thousands, even millions of years, extinction can happen in a decade. The current extinction rates is running anywhere from 100 to 1,000 times the natural rate. Since 2000, six million hectares of

primary forests have been lost each year. This may not be surprising, while considering the fact that in the past few decades India has lost at least 50 per cent of its forest, polluted over 70 per cent of its water bodies, built or cultivated on much of its grasslands, and degraded many coastal areas. All over the world, about 60, 000 species of plants and 200 species of animals are on the verge of extinction. The disappearance of species also means reduction of genes from the gene pool. This reduction in the genetic resources of the earth is known as genetic erosion. In this era of biotechnology, genetic pool is a great resource and genetic erosion is a great loss. The twentieth century has witnessed a loss of 75 per cent of the genetic diversity of crop plants. In the existing biodiversity, only 15 food crops provide 90 per cent of the world's food energy intake. Among vast pool of biodiversity, only three crops- rice, wheat and maize are the staple food of 4 billion people. The food grain demands by the year of 2020 is anticipated to be around 250 million tonnes, which means an extra 72 million tonnes of food grains are to be produced. The demand of the foodgrains can be met by tapping the pool of genetic biodiversity existing in the nature. Genetic diversity can provide us the useful traits to counter the weather adversities like drought and flooding, disease and pest attack and other genes for higher productivity and quality traits.

Climate Change

Agriculture as we know it today is founded on the natural capital of wild biodiversity and the outcome of interaction between human and natural selection. Increasing specialization and intensification of production systems has led to reduction in crop and livestock biodiversity, increasing genetic vulnerability and erosion. Concurrently, wild biodiversity is still declining rapidly, in no small measure because of expansion of agricultural areas. At the same time food insecurity is a major and growing problem with more than 1 billion people considered food insecure in 2009. Climate change aggravates the situation for both biodiversity conservation and food security by increased risks of crop failure

and population extinctions because of the higher frequency of extreme events and progressive change in key climate variables. Among causes of biodiversity loss are the fragmentation and degradation of habitat, overexploitation of natural resources, pollution, climate change and invasive species.

Green revolution in India has resulted in the adoption of modern varieties in replacement of landraces or traditional varieties, as well as a reduction in the number of crops and varieties grown. These factors are considered major causes of loss of crop genetic diversity. In recent decades, the development of improved or modern crop varieties for major commodity crops has had a significant impact on improving food security and reducing poverty. On the environmental side, increases in pesticide and fertilizer use accompanying high-yielding varieties have, in some cases, generated serious damage to land, water and even human health.

India has also to play a vital role in this gigantic task with huge diversity pool and human population. India is among the 17 mega-diverse countries that are custodian of 70 per cent of the world's biodiversity. It is home to the three of the 34 'global biodiversity hotspots', biologically rich areas facing severe conservation threats. India's biodiversity is of immense economic, ecological, social and cultural value and its potential future value is far greater. The eco-system services from the forested watersheds of two major mountain chains- the Himalayas and the Western Ghats- indirectly support several million people and non-timber forest products alone have been estimated to be worth \$ 200 million a year.

The biodiversity in nature is essential to human existence. It plays a significant role in natural processes such as the purification of water and air, pollination, the absorption of carbon by trees and other plant life, renewed oxygen supply, natural pest control, flood and erosion control and the absorption and detoxification of human and industrial wastes. Conservation of biodiversity is the planning and management of biological resources in a way so as to secure their wide use

and continuous supply, maintaining their quality, value and diversity. In this International Year of Biodiversity, we have to focus on preservation of species that are endangered. There is a need for prevention of extinction through sound planning and management. Our concerted focus should be on preservation of varieties of food crops, forage plants, timber trees, livestock, animals and their wild hosts. In addition, habitats of wild relatives where species feed, breed, nurse their young ones and rest should be identified, safeguarded and protected. International trade in wild plants and animals should also be regulated. The focus of the year should also be to encourage individuals, organizations and Governments to take immediate steps to halt biodiversity loss. Globally, dialogue should be started between stake holders for the steps to be taken in the post 2010 period.

There is an urgent need to step up efforts to mitigate the losses in biodiversity and implement long term measures to preserve this rich treasure. The public expenditure on biodiversity conservation in the developing countries has stagnated at \$ 2 billion per annum. Whereas, the expenditure on conservation of biodiversity, at global level is between \$ 8 and 10 billion. These efforts are minimal. We have resources but there is need to change our mind set and our priorities. This can be gauged from the appalling fact that the projected military world expenditure of the year 2010 is close to \$ 1.4 trillion. There is need to think about our future investments, whether we want to invest in future of mankind or their destruction.

Biodiversity conservation cannot be brought about by enforcement of laws only. It must come from within because we love the earth and all living beings thereof. The slogan for the International Year of Biodiversity is "Biodiversity is life. Biodiversity is our life." We have to keep in mind that biodiversity is nature's insurance policy against disasters.

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Rid Kashmir from the menace of 'Charas'

Zeenat Zeeshan Fazil

The tranquility of Kashmir has been broken more than a few times in the past few months but it seems that the only problem to be sorted is not one that is most apparent. A major chunk of land in areas in Pulwama, Shopian, Quazigund, Tral and Pahalgam areas of South Kashmir which is used for both agriculture and horticulture is under the cultivation of another kind of cultivation --narcotic crops. Poppy seeds or 'Charas or 'Fukki' is a hardy crop and can be grown easily. It does not require much inputs and locals say that one just needs to put seeds into the soil and go back home and forget about. It will grow automatically.

What is more, it fetches good returns and finds lucrative markets not only locally but outside the state to major cities in India.

The question is how does this happen under the nose of the government authorities? The cultivation of opium poppy crop and other kinds of psychotropic drugs is an offence under Section 18 of the Narcotic Drugs and Psychotropic Substances (NDPS Act) of 1985 punishable up to ten years of rigorous imprisonment and a fine upto Rs. One Lakh. The sale and purchase of such drugs is also an offence as prescribed under Section 15 of the Act.

This Act passed by the Central Government would naturally need to be played out by different states according to need on the ground. Infact Section 10 of the Act empowers state governments to permit and regulate possession and inter-State movement of opium, poppy straw, and the manufacture of medicinal opium and the cultivation of cannabis (charas).



In Kashmir then what is happening is clearly an illegal cultivation and illegal trade. Yet both flourishing each feeding the other supported by the silent, unseen hands, obviously powerful ones. The situation here then clearly points to a nexus in place which not only overlooks the cultivation of these crops but facilitates their movement across and beyond the state borders. According to Arjimand Hussain, Project Manager, Action Aid International the economic returns from mustard seeds and other crops are low. To overcome this loss, farmers turn to a more lucrative crop. Opium, cannabis(charas) and such crops which are cultivated illegally serve as a good source of economy as the produce fetches good returns based on a thriving trade, needless to say illegal. The narcotic plantation also happens surreptitiously. Crops are cultivated in a rather tricky manner. Mustard and other food crops are cultivated along the periphery of the field which camouflages tiers after tiers of cannabis and other addictive crops planted in the centre.

In Kashmir, it is the State Police which is in charge of the administration of the NDPS Act, as also certain other agencies like the State Excise and Drugs Control Department. Understandably it is a maze of operations but where it comes into public contact are at check posts on national highways which ostensibly are the routes for the movement of the drug. Locals say "The smugglers grease the palms of officials who then turn a blind eye to the smuggling of narcotic substances in fruit-laden trucks or other vehicles".

Sources also say that even though sometimes Excise officials claim to have recovered a certain quantity of 'charas' or 'fukki' but this is a mere eyewash to cover up for major quantities that are in fact allowed to pass through. There is obviously money to be made in this trade.

Political patronage apart, there are some very practical, even logistical difficulties in seizing of a particular cache of narcotic substance enroute on the highways. Given the heavy movement of

traffic, particularly trucks at all times of the day and night, unless backed by some fine intelligence, it would become impossible to intercept the vehicle. An official of Excise citing an example said "after acting on a tip off we recently recovered nine boxes of 'fukki' that were concealed in a truck carrying 640 apple boxes meant to be transported outside the state. We began checking the truck at around 2 am, but finally succeed in recovering the illegal substance around 7 pm." According to Commissioner Excise, G A Peer "Our job is only to collect toll tax for vehicles passing through the toll post." He, however, added that they act based on a tip from their reliable sources on possible smuggling of the substances on a particular route and time.

Given the complex scenario and the years of a comfortable situation between the different players involved, what can be done to stop this heinous trade? Or vigilance to be stepped up at posts or even weaning away local farmers from its cultivation. Can traders at the local level be intercepted?

Perhaps a non-confrontational way which could actually prove effective would be to go back to the basics, explore and find why farmers are opting for this 'dangerous' cultivation and find solutions. Let them become aware of the potential hazards and also potential alternatives to this crop. With some effort and imaginative techniques, the land used for growing narcotics can be used for plantation of diverse trees which would not only generate income for the growers but boost economy of the state.

The land used for 'Charas' can yield aromatic crops, medicinal plants and for growing poplar trees. It could be used for flower plantation like lavender and Bulgarian roses. A move which would rid the farmlands of Kashmir from this menace and cut off the supplies that sets in motion a heinous route for narcotics would be welcome by all those who yearn for a pristine environment and life.

(Charkha Features)

Enhancing the Bargaining Power of the Rural Poor-Mahatma Gandhi NREGA

B. K. Sinha

As the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) completes five years since its launch from Anantapur in Andhra Pradesh on 2nd February 2006, it has made deep inroads into the lives of millions of rural poor generating livelihood opportunities. With its spread over 625 districts across the country, the premier flagship program of the UPA Government has raised the productivity, increased the purchasing power, reduced distress migration and helped in creation of durable assets in rural India.

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Objective

The objective of the Act is to **enhance the livelihood security of people in rural areas by guaranteeing 100 days of wage-employment in a financial year to a rural household whose adult members volunteer to do unskilled manual work.** These works include water conservation, drought proofing, irrigation, land development, rejuvenation of traditional water bodies, flood control and drainage work, rural connectivity and work on the land of SC/ST/BPL/IAY beneficiaries/land reform beneficiaries/individual small and marginal farmers.



Highlights

- Employment provided to 4.1 crore households in 2010-11 up to Dec.10.
- Women constitute 50% while Scheduled Castes account for 23 %, and Scheduled Tribes 17% of the workers under Mahatma Gandhi NREGA in 2010-11.
- Wage rates enhanced by 17-30% by linkage with Consumer Price Index for Agricultural labour calculated on the basis of Rs. 100 or the actual wage rate, whichever is higher as on April 1,2009
- Around 9.38 crore accounts of Mahatma Gandhi NREGA beneficiaries opened in post offices/banks contributing to financial inclusion.
- Allocation of funds for 2010-11 raised to Rs. 40,100 crore.
- Water Conservation, irrigation and land development account for over 75 % of work taken up in 2010-11
- Over 68 lakh works taken up under MGNREGA so far.

New Initiatives

Enhancement of MGNREGA wage rates by 17-30 % by linking it with Consumer price index for agricultural labour calculated on the basis of Rs. 100 or the actual wage rate, whichever is higher as on April 1st, 2009. The new wage rates which come in to effect from January 1,2011 are higher than the prevailing wage rates under MGNREGA at present in many states.

Wage disbursement to Mahatma Gandhi NREGA workers through Banks/Post Office accounts has been made mandatory. Around 9.38 bank/post office accounts have been opened so far.

On line Monitoring : Job cards, muster rolls, wage payments, number of days of employment provided and works under execution have been put up on the website www.nrega.nic.in for monitoring and easy public access for information.

District Level Ombudsman: Set up to receive complaints from Mahatma Gandhi NREGA workers and others on any matters, consider

such complaints and facilitate their disposal in accordance with law.

Social Audits made mandatory: Gram Panchayats have been asked to organize Social Audits once in every six months. Reports on Social Audits uploaded on the MGNREGA website. 73 % Gram Panchayats have reported to have undertaken Social Audits in 2010-11 so far.

National Level Monitors (NLMs) Visit: 37 National level Monitor were deputed in 37 districts in 15 states for special monitoring of the program.

Eminent Citizen Monitors: 61 Eminent Citizens have been identified so far as per the Guidelines of the Scheme for independent monitoring. It is proposed to set up a group of 100 Eminent Citizen Monitors to Report on the progress of the scheme. Vigilance and Monitoring committees (V&MCs) at State and District level have been re-constituted for effective monitoring of the implementation of the program.

National Helpline for receipt of complaints: Toll free National Helpline 1800110707 has been set up for the protection of workers entitlements and rights under the Act. This is being made CT enabled and linked with the State and District Level Helplines.

State Helplines: Haryana, Himachal Pradesh, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Meghalaya, Orissa, Sikkim, Uttar Pradesh, Uttarakhand, West Bengal, Goa, Andaman and Nicobar Islands etc. have set up state level helplines.

Partnership with Unique Identification Development Authority of India (UIDA): Mahatma Gandhi NREGA is collaborating with UIDA. By creating a unique identity of the individual the process would eliminate duplicate job cards, ghost beneficiaries while facilitating easy bank account opening, tracking the mobility of beneficiaries and ensuring a better monitoring of the system.

Construction of Bharat Nirman Rajiv Gandhi Sewa Kendra: Gram Panchayat Bhawans at the Gram Panchayat or block level: Included as a permissible activity under the Act. Use of administrative head of 6% under the Scheme has been permitted for

provision of latest ICT facilities in Gram Panchayats (BNRGSK) within the permissible norms of the State Government subject to due procedures.

Enlarging the scope of works permitted: Works related to provision of irrigation facility, horticulture plantation and land development facilities on the private land owned by SCs and STs or below poverty line families (BPL) has been permitted under the Act. Gram Panchayats while approving work plans have been asked to ensure that works on lands of SC / ST and BPL receive first priority.

Work under Mahatma Gandhi NREGA in Naxal affected States: Union Government has issued instructions to all naxal affected States (Andhra Pradesh, Bihar, Chhattisgarh, Jharkhand, Madhya Pradesh, Maharashtra, Orissa and Uttar Pradesh) to intensify awareness generation campaign among rural households, issuance of job cards, implementing sufficient number of works and timely payment of wages.

Convergence: Guidelines have been developed for convergence of the Mahatma Gandhi NREGS with different Schemes and specific programs. 150

convergence pilot projects have been instituted in 23 states under the monitoring of National Institute of Rural Development.

Business Correspondent Model: Adopted in Rajasthan with the help of Central Bank of India to ensure timely payment of wages to the workers.

Strengthening Monitoring Mechanisms: A Professional Institutional Network (PIN) has been constituted, including IITs, IIMs, ASCI, IIPA, IIFM agriculture universities and other professional institutions, for lending support to Mahatma Gandhi NREGA to conduct impact assessment and concurrent monitoring and appraisal.

Management and Administrative support for social audit, grievance redressal and ICT infrastructure has been strengthened.

The steps taken under Mahatma Gandhi NREGA are poised to ensure transparency and accountability while reaching out to the last mile making it an effective instrument of poverty alleviation on the road to inclusive growth & development. (PIB Features)



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PERFORMANCE OF THE MAHATMA GANDHI NREGA (National Overview)

FEATURES	(FY 2006-07) 200 Districts	(FY 2007-08) 330 Districts	(FY 2008-09) 615 Districts	(FY 2009-10) 619 Districts	(FY 2010-11) 625 Districts Till Dec.,2010
Employment provided to households:	2.10 Crore	3.39 Crore	4.51 Crore	5.26 Crore	4.10 crore
Persondays [in Lakhs]:					
Total:	90.5	143.59	216.32	283.59	145
SCs:	22.95 [25%]	39.36 [27%]	63.36 [29%]	86.45 [30%]	32.65 [23 %]
STs:	32.98 [36%]	42.07[29%]	55.02 [25%]	58.74 [21%]	24.83 [17%]
Women:	36.40 [40%]	61.15 [43%]	103.57 [48%]	136.4 [48%]	72.93 [50%]
Others:	34.56 [38%]	62.16 [43%]	97.95 [45%]	138.40 [49%]	87.52[60%]
Budget Outlay: (In Rs Crore)	11300	12000	30000	39,100	40,100
Central Release (In Rs. Crore.)	8640.85	12610.39	29939.60	33506.61	24601.98
Total available fund [including OB: (In Rs. Crore)	12073.55	19,305.81	37397.06	49579.19	39594.54
Expenditure (In Rs. Crore.)	8823.35	15856.89	27250.10	37905.61	20854.46
Expenditure on wages (In Rs. Crore.)	5842.37 [66%]	10738.47 [68%]	18200.03 [67%]	25579.32 [70%]	14316.36 [71%]
Average Wage per day (In Rs.)	Rs. 65	Rs.75	Rs.84	Rs.90	Rs.99
Total works taken up (In Lakhs):	8.35	17.88	27.75	46.17	68.60
Works break up:					
Water conservation:	4.51 [54%]	8.73 [49 %]	12.79 [46%]	23.43 [51%]	34.20 [50%]
Provision of Irrigation facility to land owned by SC/ST/ BPL and IAY beneficiaries:	0.81 [10%]	2.63 [15 %]	5.67 [20%]	7.73 [17%]	8.04 [12%]
Rural Connectivity:	1.80 [21%]	3.08 [17 %]	5.03 [18%]	7.64 [17%]	14.73 [21%]
Land Development:	0.89 [11%]	2.88 [16%]	3.98 [15%]		
Bharat Nirman Rajiv Gandhi Sewa Kendra works undertaken					18232

(The author is Secretary, Ministry of Rural Development)

FISH – A GOOD SOURCE OF NUTRITION

Amita Saxena and C.D. Sharma

Fish is important in the developing world. In some of Asia's poorest countries (Bangladesh, Cambodia) people derive as much as 75% of their daily protein from fish. In West Africa fish accounts for 30% of animal protein intake, and this number would be larger if the poor could afford to buy more.

Better nutrition means stronger immune systems, less illness and better health. Healthy children learn better. Healthy people are stronger, are more productive and more able to create opportunities to gradually break the cycle of poverty and hunger. Better nutrition is a prime entry point to ending poverty and a milestone to achieving better quality of life.

Fish is especially important in the developing world. In some of Asia's poorest countries (Bangladesh, Cambodia) people derive as much as 75% of their daily protein from fish. In West Africa fish accounts for 30% of animal protein intake, and this number would be larger if the poor could afford to buy more.

A poor diet can have an injurious impact on health, causing deficiency, diseases such as scurvy berry, and kwashiorkor; health-threatening conditions like obesity and metabolic syndrome, and such common chronic systemic diseases as cardiovascular disease, diabetes, and osteoporosis.

There are seven major classes of nutrients: carbohydrates, fats, fiber, minerals, proteins, vitamins, and water. These nutrient classes can be categorized as either macronutrients (needed in relatively large amounts) or micronutrients (needed in smaller quantities). The macronutrients are carbohydrates, fat, fiber, proteins, and water. The micronutrients are minerals and vitamins.



The macronutrients (excluding fiber and water) provide energy, which is measured in joules or kilocalories (often called “Calories” and written with a capital C to distinguish them from gram calories). Carbohydrates and proteins provide 17 kJ (4 kcal) of energy per gram, while fats provide 37 kJ (9 kcal) per gram. Vitamins, minerals, fiber, and water do not provide energy, but are necessary for other reasons.

Molecules of carbohydrates and fats consist of Carbon, Hydrogen, and Oxygen atoms. Carbohydrates range from simple monosaccharides (glucose, fructose, galactose) to complex polysaccharides (starch). Fats are triglycerides, made of various fatty acid monomers bound to glycerol. Some fatty acids, but not all, are essential

in the diet: they cannot be synthesized in the body. Protein molecules contain nitrogen atoms in addition to the elements of carbohydrates and fats. The nitrogen-containing monomers of protein are amino acids, and they include some essential amino acids. They fulfill many roles other than energy metabolism; and when they are used as fuel, getting rid of the nitrogen places a burden on the kidneys.

Other micronutrients include antioxidants and phytochemicals.

Most foods contain a mix of some or all of the nutrient classes. Some nutrients are required regularly, while others are needed only occasionally. Poor health can be caused by an

Illnesses caused by improper nutrient consumption

Nutrients	Deficiency	Excess
Energy	Starvation ,starvation	Obesity ,diabetes, cardiovascular diseases,
Simple carbohydrates	none	Diabetes mellitus, obesity
Saturated fat	low sex hormone levels	Cardiovascular diseases
Fat	Malabsorption of Fat-soluble vitamins,	Cardiovascular diseases (claimed by some)
Omega 3 Fats	Cardiovascular diseases	Bleeding, Hemorrhages
Omega 6 Fats	none	Cardiovascular diseases, cancer,
Cholesterol	none	Cardiovascular diseases (claimed by many)
Protein	kwashiorkor	Rabbit starvation
Sodium	Hyponatremia	Hyponatremia, hypertension
Iron	Anemia	Cirrhosis heart diseases
Iodine	Goiter, hypothyroidism	Iodine toxicity (goiter, hypothyroidism)
Vitamin A	Xerophthalmia and Night Blindness, low testosterone levels	Hypervitaminosis A (cirrhosis, hair loss)
Vitamin B1	Beri-Beri	
Vitamin B2	Cracking of skin and Corneal Unclearation	
Niacin	Pellagra	Dyspepsia, cardiac arrhythmias, birth defects
Vitamin B12	Pernicious Anemia	
Vitamin C	Scurvy	diarrhea causing
Vitamin D	Rickets	Hypervitaminosis D (dehydration, vomiting, constipation)
Vitamin E	nervous disorders	Hypervitaminosis E (anticoagulant: excessive bleeding)
Vitamin K	Hemorrhage	
Calcium	Osteoporosis, tetany,carppedal spasm,larynogospasm,cardic arrhythmias	Fatigue, depression, confusion, anorexia, nausea, vomiting, constipation increased urination
Magnesium	Hypertension	Weakness, nausea, vomiting, impaired breathing,
Potassium	Hypokalemia, cardiac arrhythmias	Hyperkalemia palpitation

imbalance of nutrients, whether an excess or a deficiency.

Mental disorders

Nutritional supplement treatment may be appropriate for major depression, bipolar, schizophrenia, and obsessive compulsive disorder, the four most common mental disorders in developed countries. Supplements that have been studied most for mood elevation and stabilization include eicosapentaenoic acid and docosahexaenoic acid (each of which are an omega-3 fatty acid contained in fish oil, but not in flaxseed oil), vitamin B12, folic acid, and inositol.

Cancer

Cancer is now common in developing countries. According a study by the international Agency for research on cancer ., "In the developing world, cancers of the liver, stomach and esophagus were more common, often linked to consumption of carcinogenic preserved foods, such as smoked or salted food, and parasitic infections that attack organs." Lung cancer rates are rising rapidly in poorer nations because of increased use of tobacco. Developed countries "tended to have cancers linked to affluence or a 'Western lifestyle' — cancers of the colon, rectum, breast and prostate — that can be caused by obesity, lack of exercise, diet and age

Hyponatremia

Excess water intake, without replenishment of sodium and potassium salts, leads to hyponatremia, which can further lead to water intoxication at more dangerous levels. A well-publicized case occurred in 2007, when Jennifer Strange died while participating in a water-drinking contest. More usually, the condition occurs in long-distance endurance events (such as marathon or triathlon competition and training) and causes gradual mental dulling, headache, drowsiness, weakness, and confusion; extreme cases may result in coma, convulsions, and death. The primary damage comes from swelling of the brain, caused by increased osmosis as blood salinity decreases. Effective fluid replacement techniques include

Water aid stations during running/cycling races, trainers providing water during team games such as Soccer and devices such as Camel Baks which can provide water for a person.

FISH AND MACRONUTRIENTS

Proteins

Proteins are important for growth and development of the body, maintenance and repairing of worn out tissues and for production of enzymes and hormones required for many body processes. The importance of fish in providing easily digested protein of high biological value is well documented. In the past this has served as a justification for promoting fisheries and aquaculture activities in several countries. On a fresh-weight basis, fish contains a good quantity of protein, about 18-20%, and contains all the eight essential amino acids including the sulphur-containing lysine, methionine, and cysteine. As most maize-based diets lack these compounds, rural households in Africa dependent on maize greatly benefit by increasing their fish consumption. Fish also complements cassava-based diets which are generally low in protein.

Fats

The fat content of fish varies depending on the species as well as the season but, in general, fish have less fat than red meats. The fat content ranges from 0.2% to 25%. However, fats from fatty fish species contain the polyunsaturated fatty acids (PUFAs) namely EPA (eicosapentaenoic acid) and DHA (docosahexaenoic acid) (omega 3 fatty acids) which are essential for proper growth of children and are not associated with the occurrence of cardiovascular diseases such as a coronary heart disease. In pregnant women, the presence of PUFAs in their diets has been associated with proper brain development among unborn babies. In other studies, omega 3 fatty acids have also been associated with reduced risk of preterm delivery and low birth weight. The fat also contributes to energy supplies and assists in the proper absorption of fat soluble vitamins namely A, D, E, and K.

FISH AND MICRONUTRIENTS

Vitamins

Fish is a rich source of vitamins, particularly vitamins A and D from fatty species, as well as thiamin, riboflavin and niacin (vitamins B1, B2 and B3). Vitamin A from fish is more readily available to the body than from plant foods. Vitamin A is required for normal vision and for bone growth. Fatty fish contains more vitamin A than lean species. Studies have shown that mortality is reduced for children under five with a good vitamin A status. As sun drying destroys most of the available vitamin A better processing methods are required to preserve this vitamin.

Vitamin D present in fish liver and oils is crucial for bone growth since it is essential for the absorption and metabolism of calcium. Thiamin, niacin and riboflavin are important for energy metabolism. If eaten fresh, fish also contains a little vitamin C which is important for proper healing of wounds, normal health of body tissues and aids in the absorption of iron in the human body.

Minerals

The minerals present in fish include iron, calcium, zinc, iodine (from marine fish), phosphorus, selenium and fluorine. These minerals are highly 'bioavailable' meaning that they are easily absorbed by the body. Iron is important in the synthesis of hemoglobin in red blood cells which is important for transporting oxygen to all parts of the body. Iron deficiency is associated with anemia, impaired brain function and in infants is associated with poor learning ability and poor behavior. Due to its role in the immune system, its deficiency may also be associated with increased risk of infection.

Calcium is required for strong bones (formation and mineralization) and for the normal functioning of muscles and the nervous system. It is also important in the blood clotting process. Vitamin D is required for its proper absorption. The intake of calcium, phosphorus and fluorine is higher when small fish are eaten with their bones rather than when the fish bones are discarded. Deficiency of calcium may be associated with rickets in young children

and osteomalacia (softening of bones) in adults and older people. Fluorine is also important for strong bones and teeth.

Zinc is required for most body processes as it occurs together with proteins in essential enzymes required for metabolism. Zinc plays an important role in growth and development as well in the proper functioning of the immune system and for a healthy skin. Zinc deficiency is associated with poor growth, skin problems and loss of hair among other problems.

Iodine, present in seafood, is important for hormones that regulate body metabolism and in children it is required for growth and normal mental development. A deficiency of iodine may lead to goiter (enlarged thyroid gland) and mental retardation in children.

It is evident that fish contribute more to people's diets than just the high quality protein they are so well known for. Fish should therefore be an integral component of the diet, preventing malnutrition by making these macro- and micro-nutrients readily available to the body.

The American Heart Association recommends that you eat fish rich in omega-3 fatty acids twice a week in order to reap specific health benefits. The American Dietetic Association and Dietitians of Canada: Women's Health and Nutrition position paper suggests consuming two to three fish meals per week, along with a low-fat diet, for heart health. Although all fish aren't high in omega-3s, they still can contribute important amounts of these fatty acids if they're eaten regularly.

Fish and shellfish are excellent sources of protein that are low in fat. A 3-ounce cooked serving of most fish and shellfish provides about 20 grams of protein, or about a third of the average daily recommended protein intake. The protein in fish is of high quality, containing an abundance of essential amino acids, and is very digestible for people of all ages. Seafood is also generally lower in fat and calories than beef, poultry or pork. Seafood is also loaded with minerals such as iron, zinc and calcium (canned fish with soft, edible bones).

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