

# NUTRITION SECURITY FOR INDIA- ISSUES AND WAY FORWARD

**A POSITION PAPER**

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## *A Position Paper*

Based on the deliberation held in the  
Symposium on 'Nutrition Security for India-Issues and Way Forward' on  
August 3-4, 2009 and subsequent discussion with the experts

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## FOREWORD

After over 60 years of independence, India has the dubious distinction of having one of the highest prevalence (over 50%) of under nutrition (as judged by stunting, wasting, and micronutrient deficiencies like anaemia, vitamin A deficiency and others), in the world. Efforts made since independence have made only marginal impact. Being a country in developmental transition, the post- transition, lifestyle and environment-related diseases like obesity, diabetes, hypertension, CVD, and cancers are also increasing. Individuals born with low birth weight due to intra-uterine malnutrition tend to be more susceptible to the above mentioned adult-onset degenerative diseases. Malnutrition is seriously and adversely impacting the country's development, and health care expenditure.

Considering the importance of the problem, the Indian National Science Academy (INSA), New Delhi, organised a symposium on Nutrition Security for India- Issues and the Way Forward, on August 3-4, 2009 with financial support from the Department of Science and Technology. Professor MS Swaminathan, Chairman, MS Swaminathan Research Foundation and MP, inaugurated the symposium. The theme of his talk was - Achieving Sustainable Nutrition Security: A road map. State of art presentations by experts on Issues such as aetiology of malnutrition (undernutrition, micronutrient deficiencies and overnutrition), its consequences, the present governmental and scientific response, and the way forward followed. The presentations and recommendations made were discussed. Additional inputs were received through circulation of the symposium report among the fellowship and other experts. The present Position Paper is based on the outcome of all those efforts.

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## EXECUTIVE SUMMARY

### The Problem

The term malnutrition implies both undernutrition including micronutrient deficiencies, and over-nutrition. After over 60 years of independence, India is still a country in developmental transition and continues to battle with infectious diseases and conditions related to undernutrition. Over 50% of preschool children and 30 % adults are undernourished as judged by anthropometric indices and over 70% of women and children suffer from anaemia. Every third child is born with low birth weight, and may have impaired mental and physical development and immunity. Intra-uterine malnutrition epigenetically predisposes to cardiovascular diseases in later life. Almost 60% of deaths due to major infectious diseases are caused by coexistence of undernutrition. In India, 36% deaths and 42% DALYs lost are due to communicable diseases, perinatal and maternal conditions and nutritional deficiencies. In the meantime post-transition life-style related diseases like obesity and chronic degenerative diseases are increasing. Over 10% Indians are overweight or obese, the incidence being almost 20% in urban areas. Apart from human suffering caused due to morbidity and mortality, malnutrition, is severely denting India's productivity and development, and adding to health expenditure.

**Nutrition Security** implies physical, economic and social access to balanced diet, clean drinking water, safe environment, and health care (preventive and curative) for every individual. Education and awareness are needed to utilise these services. Thus malnutrition has a complex aetiology and its prevention requires **Awareness**, and **Access** to all the above at **Affordable** cost. Women's health, nutrition, education and decision making through empowerment are important for nation's nutrition security but remain neglected due to societal biases. Countrywide diet surveys show that Indian diets are qualitatively more deficient in vitamins and minerals (hidden hunger) than proteins due to low intake of income-elastic foods like vegetables, fruits, pulses and foods of animal origin. Nutritious millets are disappearing. Within the family diet of preschool children are particularly inadequate, due to ignorance and time constraint on mothers rather than affordability. More than 70% preschool children consume <50 % of recommended amount (RDA) of iron, vitamin A, and some B vitamins particularly riboflavin and folic acid.

Within India, states like Kerala and Tamil Nadu have relatively better nutrition parameters than states with higher calorie intake (Madhya Pradesh) or economic growth (Gujarat, Maharashtra) suggesting that the situation is more complex than mere access to food (calories) or income, important as they are. Time trends suggest

that over the years despite reduction in food and nutrient intake, nutrition status has shown some improvement, perhaps because of better access to health care and reduced physical activity. However, there is no reduction in the prevalence or severity of anaemia.

Non-dietary factors also influence nutrition status. Undernutrition reduces immunity and infections reduce appetite, impair absorption and lead to catabolic losses of precious nutrients. Thus access to clean environment and drinking water to prevent infections are areas of great concern. Increasing prevalence of obesity and chronic diseases is due to more sedentary lifestyles, shift to less fibre, high fat refined carbohydrate diets, stress and addictions. Crowded urban areas leave little space for physical activity like walking or play even for children.

Neither government nor scientists can be faulted for being silent spectators. Efforts have been made. Food grain (wheat and rice) production went up markedly and kept ahead of population growth till mid nineties, but has subsequently plateaued. Unfortunately pulse production has stagnated and per capita availability has declined. There is erosion in millets production and consumption. Milk and fruit and vegetable production has increased markedly with India holding 1st and 2nd positions respectively in the world. But that is not reflected in the diet of the poor due to poor purchasing power, and lack of awareness about their nutritional importance. Loss of almost 30% of farm produce is occurring due to inadequate post harvest storage facilities, and food processing for value addition. New technologies for bio-fortification of crops have been developed, but entry of biofortified crops in the food basket may take some time.

Several programmes, missions and acts including a National Nutrition Policy (1993), National Nutrition Plan of Action (1995) and National Nutrition Mission (2001), have been formulated with scientific and technological underpinning. But they have yet to achieve nutrition goals. Some of the reasons are: 1. Nutrition is a poor cousin even in health and agriculture planning and execution; 2. Nutrition improvement is not a stated goal with measurable parameters for monitoring, in missions like National Food Security Mission, National Horticulture Mission and National Rural Health Mission, leave aside others aimed at income, sanitation and drinking water; 3. Top-down approach without sensitising the community and making them partners in planning and execution; 4. Poor targeting, accountability, and governance; 5. Inadequate importance to nutrition in school, college and even professional (health, agriculture, social science) education; 6. Neglect of women and children's health and education. 7. Vertical programmes with poor convergence and synergy between functioning of ministries and departments.

## The Way Forward

Nutrition should be clearly stated as an important input and output parameter for judging development and should not be treated as trickle down beneficiary of economic and industrial development. It should not get subsumed under curative or preventive health care in general, where emphasis tends to be on chronic diseases and immunization—important as they are. Without Nutrition, neither communicable nor non-communicable diseases can be prevented and hence it should have an important status as an independent entity. Malnutrition is the worst form of non-communicable disease. Leadership and efficient governance are required at all levels to ensure synergy through convergence between Programmes/Missions/ Acts which impact nutrition directly or indirectly (income, sanitation, drinking water, feeding programmes etc.) run by different departments/ ministries like health, women and child development, agriculture, civil supplies, and others. Planning and execution should be done with community participation and involvement of trained nutrition leaders from the community. There should be greater scientific dialogue and interaction between nutrition scientists and scientists belonging to agriculture, food technology, medicine, public health, and basic sciences as well as social scientists. The buzz word should be Nutrition Security for all.

The best approach is to concentrate on proven interventions which have reduced the scale of malnutrition in some states of India and in some less endowed countries. The following table lists some of the implementable suggestions, action points, and nodal central and state ministries. Partnership with NGOs and corporate sector can be explored without compromising the interest of the poor.

**Table-Specific Suggestions for the Way Forward**

	Suggestion	Action point/Nodal central and state ministries
1	Proper breast feeding and complimentary feeding practices, as prescribed by WHO/UNICEF and support systems to enable infant care.	IEC for behavioural change among mothers - Ministries of health (MOH), women and child development (WCD), Information and broadcasting.(I&B).
2	Nutrition management during illness, including diarrhea.	IEC of health professionals and mothers, ICDS workers, and ASHA-MOH, WCD.
3	Early detection and effective home based management of mild and moderate under nutrition, referral and therapeutic feeding for rehabilitation of severe under nutrition.	IEC, of health professionals and mothers, ICDS workers, and ASHA-MOH, WCD.
4	Full immunization.	Administrative efficiency, IEC of community, ICDS, and ASHA workers. Training of health professionals—MOH, WCD.



5	Women's education, health and empowerment- a life cycle approach.	IEC of community and professionals, to change mind set.- MOH, WCD and Human resource development (HRD).
6	Access to clean environment, drinking water, and food safety.	Ministry of rural development (MRD), urban municipality, panchayati raj.
7	Increased food production using conventional and new technologies; nutritionally oriented cropping pattern; decentralised planning for food production including homestead production of income- elastic protective foods and advocacy for dietary diversification.	Orientation and training of agriculture extension workers, IEC of farming community. Ministry of agriculture (MOA), ICAR, State agriculture universities, R&D institutions.
8	Distribution of salt fortified with adequate iodine and ensuring its consumption in all areas particularly the endemic areas for iodine deficiency. Now that salt double fortified with iron and iodine with proven efficacy is available, and cleared for production and sale, it should replace iodised salt.	IEC of community to create demand. Market availability-MOH, Civil supplies, I&B, for promotion through multi-media channels.
9	Effective distribution of iron folic acid tablets for pregnant and lactating women, children and adolescent girls and de-worming.	IEC of community to ensure compliance. Training of ICDS workers, ASHA and medical professionals-MOH, WCD, I&B.
10	Bi-annual supplementation of massive dose vitamin A in areas, where vitamin A deficiency is a public health problem.	IEC of community to ensure compliance. Training of ICDS workers, ASHA and medical professionals. Ensure supply-MOH, WCD, I&B.
11	Establishment of community grain bank, seed bank, water bank.	IEC of community, creation of infrastructure-MOA, MRD.
12	Popularisation of the Food guidelines for Indians through media and educational channels.	IEC of community through multimedia channels. - I&B, HRD ministry.
13	Strengthening of public distribution system and broadening the basket with inclusion of millets, pulse and oils.	Civil supplies.
14	Integrated post-harvest management including establishment of silos in every taluq and food processing to prevent wastage and generate employment.	MOA, MRD, ministry of food processing industries (MFPI), S&T institutions.
15	Town planning. Ensure lung space and place for walking, exercise and play ground for children.	Urban town planning. Municipal corporations, HRD.

## **MALNUTRITION AND NUTRITION SECURITY-DEFINITION**

The term **Malnutrition** includes both under-nutrition in terms of proteins, calories, fats, vitamins and minerals, and over-nutrition leading to obesity.

**Nutrition Security** implies physical, economic and social access to balanced diet, clean drinking water, safe environment, and health care. Education and awareness are needed to utilise these services.

## **THE PROBLEM OF DOUBLE BURDEN OF DISEASE, AND ITS CONSEQUENCES**

### **Magnitude of the Double Burden of Undernutrition and Overnutrition**

Being a country in developmental transition, India faces the double burden of pre-transition nutrition deficiency disorders and infectious diseases as well as post-transition chronic degenerative diseases associated with overweight and obesity.

After over 60 years of independence the resistant problem of under-nutrition persists though some of the severe clinical forms have declined and magnitude, except for anaemia has marginally decreased despite increase in population. According to the latest survey (2005-06), the prevalence of Low birth weight (LBW) is nearly 30%. About 55 % of preschool children are under weight (weight for age), and 50% stunted (weight for height). Micronutrient deficiencies, mainly iron deficiency anaemia (70% in women and children), iodine deficiency disorders, and vitamin A deficiency continue to be public health problems, though prevalence of goitre has declined and blindness due to vitamin A deficiency has been eliminated. B-vitamins deficiencies (riboflavin, folic acid and perhaps B12) are common. Despite tropical sunlight, reports of vitamin D deficiency in adults and children are appearing. Osteoporosis in women, perhaps due to calcium and vitamin D deficiencies has become a public health problem.

There are marked interstate variations with some of the southern states, mainly Kerala, and Tamil Nadu, which were traditionally better, continuing to be better than states like Bihar, Madhya Pradesh, Uttar Pradesh, Rajasthan, and Orissa. Interestingly, the National Family Health Surveys show that the State of Jammu and Kashmir has shown some improvement in women's health as judged by decline in anaemia from 60% to 54% between 1995-96 and 2005-06, whereas in all other states anaemia in women has remained unchanged or increased over the same period.

At the other end of the spectrum, overweight and obesity are increasing. According to recent surveys of the National Nutrition Monitoring Bureau in 9 states, 7.8% men and 10.9% women are overweight or obese when a cut off value of BMI 25 is used. However, currently a lower BMI of 23 is suggested since above that the susceptibility to hypertension increases. With this cut off value, the percentage of

overweight/obesity increases to 17.2–men and 19.2–women. A fourth of Indian adults have hypertension, and 5-6% have impaired glucose tolerance or diabetes. These statistics should ring alarm bells, and suggest that while urgent action is needed to reduce the massive burden of under-nutrition, action is also needed to check the growing trend of post transition diseases like obesity, and associated chronic diseases like diabetes, hypertension, cardiovascular diseases and even cancer, arthritis and others. India is considered to be the diabetic capital of the world.

Time trends since 1995 (NNMB and NFHS surveys) show that intake of all food groups and nutrients has declined. Despite this, and increasing population; undernutrition has declined marginally. Most of the reduction in childhood undernutrition is likely to be due to improved access to health and nutrition services. Simultaneously there has been some increase in overnutrition rates; largely due to steep reduction in physical activity due to mechanisation, and motorised transport.

### **Consequences of Undernutrition**

Apart from human suffering, malnutrition is one of the major causes of morbidity, mortality, loss of national productivity and medical expenses. Under nutrition contributes to 60% of deaths due to infectious diseases like malaria, measles, diarrhoea, pneumonia and perinatal disorders in preschool children. In India, 36% deaths and 42% DALYs lost are due to communicable diseases, perinatal and maternal conditions and nutritional deficiencies. Children born with low birth weight remain stunted. Their learning capacity and ability to fight infections is impaired. Intrauterine malnutrition and consequent low birth weight epigenetically predisposes to higher body fat and lower muscle mass (the lean fat babies). In later life they are more susceptible to life-style related chronic diseases like the syndrome X (diabetes, hypertension, dyslipidaemia). This trend is of particular concern to a rapidly developing country like India where many individuals who are born with low birth weight due to poverty and maternal malnutrition, shift to affluence and indulgence later.

## **AETIOLOGY OF MALNUTRITION**

### **Dietary Factors**

For infants the best food is mother's milk. According to WHO/UNICEF guidelines, there should be exclusive breastfeeding for the first six months, and introduction of complimentary food (with continuation of breast feeding) after that. Yet the rate of exclusive breast feeding in the first six months is only 46%, and complimentary feeding of 6-9 months old infants only 57%.

Country wide surveys done by the National Nutrition Monitoring Bureau (NNMB) show, the following.

1. Cereal-pulse based Indian diets are qualitatively deficient in micronutrients particularly iron, vitamin A and riboflavin (hidden hunger), due to low intake of income- elastic protective foods such as pulses, vegetables particularly green leafy vegetables (GLV), fruits, and foods of animal origin. There has been substantial erosion of millets production and consumption over time.
2. NNMB Surveys done between 1975-79, and 2005-06, show marked reduction in the intake of foods, (expressed as percentage of Recommended Dietary Allowance-RDA for consumption unit). Cereals->100 to 82, pulse-85 to 70, milk-77 to 55, and sugar-77 to 47, with a transient increase in 1996-97. Intake of vegetables has remained low but marginal improvement in the intake of green leafy vegetables (GLV) has occurred (20 to 40).
3. These declining trends in food intake are reflected in the intake of nutrients as percent RDA over the same period. Energy-97 to 76, protein-103 to 82, calcium-152 to 110, iron-62 to 53. Intake of vitamins has remained more or less the same, marked deficits being observed in the intake of vitamin A and riboflavin - 43% of RDA.
4. Within a family dietary deficits are more marked for preschool children due to inequitable distribution of food. This is because of lack of awareness of children's nutritional needs, and inability of child to articulate. While income cannot be blamed if the family has enough food for adults, time constraint on the mother who has to go out to work to supplement the family income, is a factor.
5. More than 70% of preschool children consume less than 50% RDA of iron, vitamin A and riboflavin.
6. Folic acid deficiency is also common. In recent years concern has been expressed about the inadequate intake of other micronutrients such as zinc, vitamin D and B12.
7. The rising trend in obesity can be attributed to shift from traditional diets which were bulky, had low energy density, were slowly digested and had high protein, low fat, unsaturated fats, complex carbohydrates- fibre, low glycaemic index, low Na/K ratio and high calcium to current diets which are energy dense, rapidly digested, and have high fat and saturated fat, refined foods low in fibre, high glycaemic index, less micronutrient density, high Na/K ratio, and low calcium.
8. Among the several factors, diet, besides physical activity, smoking etc has profound epigenetic effect on developing predisposition to chronic diseases like CVD, cancer and many others at the foetal stage.

## **Environment, Water and Disease**

1. Burden of infectious diseases is very high in India due to poor environmental sanitation, water scarcity, particularly potable water, and poor personal hygiene.
2. Illnesses affect nutrition through 1) reduced intake and impaired absorption 2) catabolic loss, and 3) financial loss due to low productivity. Despite expanding economy India remains a 'museum of pathology'.
3. Most of the infectious diseases are preventable by vaccination but coverage is very low. The recent NFHS-3 survey showed only 44% coverage in recommended vaccination of children aged 12-23 months, with marked rural urban difference—urban 60%, rural 39%. There were marked interstate variations with Tamil Nadu close to 90% and Bihar, Nagaland, Meghalaya, Assam, Rajasthan, Uttar Pradesh and Madhya Pradesh less than 25%. While sex did not influence vaccination coverage, mothers' education had profound effect. India is among the only developing country with no second opportunity for measles vaccine.
4. Access to safe drinking water and use of latrines is very low. Acceptance of latrines is poor due to scarcity of water.

## **Income and Other Factors**

1. Purchasing power is necessary to access food and nutrition security. Thus poor tend to be more undernourished than the rich. However, malnutrition is not confined only to the people below the poverty line (BPL). Many people above the so called poverty line are also undernourished. Hidden hunger is seen even in the so called well-to do and 'safety net' is needed for them as well. FAO Estimates that rising prices have plunged an additional 75 million people below the hunger threshold.
2. Within India states like Kerala and Tamil Nadu have relatively better nutrition parameters than states with higher calorie intake (Madhya Pradesh) or economic growth (Gujarat, Maharashtra) suggesting that the situation is more complex than mere access to food (calories) or income, important as they are.
3. Comparison of NFHS-2 (1998-99) and NFHS-3 (2005-06), survey data on growth and nutritional status of preschool children show that distribution of weight and height around the mean remain remarkably stable over age, suggesting that factors beyond access to food and environment also play a role.
4. Dispersion of weight and height around the mean are much greater in India than in international norms. This suggests some role of inherited factors in India. Recent studies show that genetic predisposition plays a role in response to nutrition, and a new science of nutrigenomics has emerged.
5. Growth faltering compared to international standards is more in the first two years, but catch-up is seen after that age. This suggests that breast feeding and weaning practices are important.

## Life Style

1. Life style is a complex interacting set of attributes not amenable to reductionist analysis.
2. Besides physical activity and diet there are other lifestyle- related factors such as migration, urban rural living, work environment, loss of sleep, abuse of alcohol, tobacco, recreational drugs, etc which lead to stress.
3. The rural to urban migration has resulted in a fall in energy expenditure. Mechanisation and use of motorised transport has reduced physical activity. This coupled with increased intake of energy-dense, refined foods appears to be responsible for the rise in the problem of overweight and chronic degenerative diseases among migrants. Life-style related factors contribute substantially to malnutrition (often over nutrition) and chronic diseases.
4. Crowded urban localities are not conducive for walking and exercise. Even some schools don't have play grounds for children to exercise and play.

## THE GENDER ISSUES

1. India's infant and maternal mortality rates-80 and 517 respectively are higher than even the neighbouring countries like Sri Lanka (12, and 60) and Bangladesh (54 and 350).
2. Sex ratio including juvenile sex ratio has shown alarming reduction over the years- (964 in 1971, 927 in 2001). This cannot be explained on education or income, because lowest sex ratios are seen in educated and wealthy communities. It shows deep-rooted gender bias.
3. India's ranking in Human Development Index (2009) (which incorporates life expectancy, adult literacy, and school enrollment and per capita income) is 134 out of 182 countries.
4. Ranking in Global Hunger Index:- 66th position of the total 88 nations surveyed. The survey is based on child malnutrition, child death rate and less calorie intake. India's position is lesser than Bangladesh and other sub-Sahara nations.
5. Ranking in Global Gender Gap Index:-113/130. It takes into consideration, Political empowerment (rank 25), Education attainment (rank 116), Health and survival (rank 128).  
These rankings do not make a nation with economic, industrial and scientific progress proud.
6. Women take double or triple burden of family, work outside and fighting patrifocal mind set. They do mostly low-paid unskilled jobs. Their educational and social status is lower than that of men and they are not part of decision making.

7. Old support system for coping, like joint families are breaking down and new ones not replacing.
8. Though there are schemes for child and maternity care, and charter of maternity entitlements, they remain by and large on paper. Women are not aware of their rights.

### **ISSUES RELATED TO AWARENESS GENERATION - INFORMATION, EDUCATION, COMMUNICATION (IEC)**

This is one of the most important issues if the message of nutrition has to spread in all sections of the society including, policy makers and planners, bureaucrats, professionals from the fields of agriculture, health and medicine, social sciences, education and others besides the community. Useful educational material and teaching aids directed to community have been developed by foods and nutrition departments of home science colleges, central and state departments of women and child development, international agencies like UNICEF and some NGOs. However, systematic multi media and other communication strategies are missing. The Rural Knowledge Centres mooted by MS Swaminathan Research Foundation (MSSRF) Chennai, have shown some promise in reaching out to the farming community on relevant knowledge in food production, nutrition and entitlements. Nutrition education through Open University is being attempted. The Solution Exchange initiative of UN agencies in India tries to leverage the use of knowledge for faster achievement of the Millennium Development Goals. It tries to bring together practitioners to share knowledge, help each other and collaborate. Solution Exchange has 13 Communities of Practice, with Food and Nutrition Security being one of them. Efforts are being made to have translations of the discussions in Indian languages. Each Solution Exchange discussion results in a Consolidated Reply, which among other things has references to innovative projects that practitioners can learn from. However, its ability to get the ear of the government and influence policies is uneven.

### **CURRENT GOVERNMENT RESPONSE**

Successive Five year plans since 1950s laid down the policies, multi-pronged strategies and multi, and inter-sectoral programmes to improve availability, and access to food, and facilitate absorption and assimilation. Such nutrition safety net programmes for increasing availability, and access to food and nutrition and improving assimilation (absorption) are:

#### **Increasing Availability of Food**

India's food grain production stayed ahead of population growth till mid nineties and food prices were stable and low. Since then, situation has worsened a bit even

on food grains (cereals) front. Fortunately last year harvest was good and food grain (rice and wheat) stocks were built. These will help to tide over the 2009 drought. Production of nutritious millets and pulses has stagnated and cost of pulses has soared. In spite of being global No 1 and 2 in milk and vegetable and fruit production, per capita consumption of these has been very low and remains unchanged due to lack of purchasing power and awareness regarding their nutritional importance.

Government has initiated several nutrition 'safety net programmes' such as:

1. Rashtriya Krishi Vikas Yojana-Increased investment in agriculture to increase growth.
2. National horticulture mission. Horticulture production has doubled. However, focus is on income and export, rather than nutrition.
3. National food security mission. Focus is on rice, wheat and pulses.

### **Improving Access**

1. National Rural Employment Guarantee Act (NREGA).
2. Integrated Child Development Service (ICDS) - targeted at preschool children and pregnant and lactating mothers. Supplementary feeding is an important component of ICDS.
3. School Mid-Day-Meal programme (MDM)
4. Annapoorna scheme-10 Kg food grains to elderly above 65 years
5. Food Security Act (proposed). National Food Security Act now being debated in the parliament promises 25 Kg rice or wheat at Rs 3/Kg for families below the poverty line (BPL).
6. Public distribution system. Currently targets BPL population, leaving out a vast segment of undernourished people above the poverty line. The issue of BPL and targeted PDS needs to be revisited from the point of view of nutrition security for all.
7. Micronutrient supplementation programmes like a) anaemia prophylaxis programme (distribution of iron folic acid tablets to pregnant and lactating women, children, and adolescent girls), b) massive dose vitamin A programme (administration of 100,000 iu of oral vitamin A to 1-6 years old children). Linking it with measles immunisation and thus netting younger children is being tried.
8. Universal iodisation of salt to combat iodine deficiency disease

Supplementary feeding and micronutrient supplementation programmes have failed to have desired impact. Among the reasons are: i. Poor targeting. In ICDS, the most vulnerable infants, 6-36 months old are not reached for practical reasons. This is the window of catch-up growth when the impact of good diet is most, ii. Improvement in nutrition is not clearly spelt out as the out-come indicator. MDM programme is primarily to improve school enrolment, iii. Perhaps the most



important reason is lack of adequate awareness in the community. Top down approach fails to elicit community participation.

### **Improving Absorption of Nutrients**

1. Rajiv Gandhi drinking water mission
2. Total sanitation programme
3. National rural health mission (2005). Emphasis only on disease prevention and mortality. **No mention of nutrition**, without which diseases cannot be prevented.

Unfortunately these schemes are working vertically department-wise, without forging convergence and synergy to make them more effective.

## **INDIAN CONSTITUTION, GOVERNMENT POLICIES, OTHER INITIATIVES DIRECTLY RELATED TO NUTRITION**

1. Article 47-Constitution of India  
State shall regard the raising of the nutrition and the standard of living of its people and the improvement of public health as its primary duties”
2. National Nutrition Policy (NNP) was formulated in 1993, and National Nutrition Plan of Action (NNPA) for translating policy statements in to action programme was drawn up in 1995 under planning commission.
3. More recently (2001) National Nutrition Mission, under the chairmanship of the Hon’ble Prime Minister to effectively implement NNP and NNPA has been formed. None of these have been operationalised. Action if any has been weak.
4. Coalition for Sustainable Nutrition Security: Initiated last year (2008) by Professor M.S. Swaminathan. Includes politicians, administrators, scientists, NGOs. International agencies and industries as partners. Sincere effort is being made. Detailed action plan has been drawn up.

## **SCIENTIFIC AND TECHNOLOGICAL RESPONSE**

1. Increased agricultural productivity through conventional methods.
2. Bio-fortification-This includes conventional breeding methods, molecular breeding and genetic engineering. Bio-fortification is a sustainable intervention being seed- based technology. No cost, once the varieties are developed and adopted. Can reach the poor (if the cost of seed is kept low and not exploited by seed companies). The Harvest Plus: bio-fortification challenge programme is an interdisciplinary, global alliance of research and implementing institutions. India is part of this. It includes: Beta carotene (pro-vitamin A)-rich sweet potato, and cassava, zinc and iron-rich rice, wheat, maize, pearl millet, and beans. DBT

network project on bio-fortification of rice, wheat and maize is currently being implemented by ICAR Institutions and state agriculture universities

Golden rice rich in pro-vitamin A; high- iron rice (high ferritin gene from mangrove-(MSSRF); high protein and essential amino acid- rich transgenic potato varieties using AMAI gene from *Amaranthus hypochondriacus* (National Institute of Plant Genome Research); oxalate- free and disease- resistant transgenic tomato using oxalate decarboxylase gene from edible mushrooms are examples of transgenic technologies.

Zero erucic acid mustard has been developed using conventional breeding methods.

Issue of bio-availability and safety need to be examined, and proper legislative checks put in place.

3. All government supplementary feeding programmes are based on research by nutrition scientists. Poor impact may not be due to technology, but implementation infirmities.
4. Recommended Dietary Allowance (RDA) for important nutrients, relevant to Indians has been worked out on the basis of experiments on humans and is periodically updated. These have been translated into dietary guidelines for ease of understanding and use by common person.
5. Nutrition status is monitored by the National Nutrition Monitoring Bureau (using dietary assessment and clinical examination), but in only 9 states. Biochemical tests for assessing nutrition deficiency at the preclinical state have also been developed, and applied in population studies.
6. Macro and micro-nutrient content of over 100 Indian foods have been analysed and periodically updated. Current research emphasis is on health giving phytochemicals (nutraceuticals) in food.
7. Food processing helps to prevent post harvest losses, generates employment, and contributes to nutrition security. CFTRI, Mysore, Defence Food Research Laboratory (DFRL), Mysore, agriculture universities, ICAR and several other institutions and NGOs have developed useful products, and storage devices. Affordability is an issue, since processing and packaging add to the cost. Nutrient-dense fortified foods like biscuits and ready to eat mixes have a role in situations like reaching food and nutrition to calamity- hit populations and special groups working in special conditions like high altitude. However, for government programmes like ICDS and MDM, proper hot meals made from raw food grains or ready- to- cook cereal-pulse products, fortified with selective nutrients like iron (whose availability through natural foods is a problem), are needed.
8. Food fortification for increasing micronutrient security eg. Iodised salt and double fortified salt, (iron and iodine). Iodised salt is being marketed since

many years. It has made marked impact on the magnitude and severity of IDD (goitre), but not eliminated it. Due to inefficient distribution and outreach, currently only 50% of Indians access to adequately iodised salt. Salt double fortified with iodine and iron, developed at the National Institute of Nutrition, Hyderabad holds great promise. It has been cleared for safety and efficacy but awaits clearance from statutory authorities (PFA) for sale in open market. It is cost effective. Salt fortified with several nutrients has been developed but is costly. Iron- fortified wheat flour is available, but cost and bio-availability are areas of concern.

Many countries are fortifying cereal products with folic acid to prevent neural tube defects. Folic acid deficiency also raises the level of homocysteine (an independent risk factor for CVD) in blood. India is still debating, though the incidence of neural tube defects is high and raised levels of homocysteine have been reported. Folic acid also prevents anaemia. Total Nutrition Security is possible by leveraging science of food technology including post harvest technologies with science of nutrition with the ultimate goal of reaching out to the most vulnerable and needy.

## THE WAY FORWARD

For health and nutrition security there has to be **Awareness**, and **Access at Affordable Cost** to Balanced diet at household and individual level, knowledge of right feeding practices, clean environment and safe drinking water, and health care outreach- primary and curative. Education, particularly of women is important for optimum utilisation of the available services and creating demand.

Long-term and short- term goals are needed. Some of the evidence- based interventions with internationally proven impact within short time are listed under Maternal and child health and nutrition, Prevention of micronutrient deficiencies, Water health sanitation and health care delivery. Food production should have nutrition security as its important goal. For ultimate behavioural change, powerful IEC methodology using education and multimedia channels has to be developed and executed. Apart from the nodal ministries mentioned, NGOs, and private sector can be involved.

## Maternal and Child Health and Nutrition

1. Guidelines of WHO/UNICEF: Correct infant feeding practices: Initiation of breast feeding within one hour of birth, exclusive breast feeding for 6 months and timely (after 6 months of age) introduction of age-appropriate, complementary food, adequate in quality and quantity. Support systems to facilitate infant feeding and care by way of maternity entitlements, crèche etc. are needed. Need for behavioural change, through IEC of community and

- health professionals–Ministry of Health (MOH) and Women and Child Development (WCD), Ministry of Information and Broadcasting (I&B).
2. Feeding during illness, oral rehydration with zinc supplementation during diarrhoea. –IEC for health workers and community. Multi-media awareness campaign. MOH, MWCD and I&B. Early detection and effective home based management of mild and moderate under nutrition and referral and therapeutic feeding for rehabilitation of severe under nutrition. –Medical and health education, awareness in the community. –MOH, MWCD.
  3. Full immunization. –Administrative efficiency. –MOH.
  4. Greater efficiency and better strategies in ICDS to reach out to young infants. Greater emphasis on mothers' education. –MWCD.
  5. Women's education, awareness and empowerment- decision making. Social engineering, through multi-media. –MWCD, HRD, I&B.
  6. Nutrition education in school (teachers, students, cooks, mothers) to stress the nutritional importance of supplementary feeding. –HRD.
  7. Nutrition should be an important input and outcome indicator in NRHM. –MOH.

### **Prevention of Micronutrient Deficiencies**

1. Screening for anaemia in pregnancy and appropriate management of anaemia during pregnancy including iron folate supplementation should be universally operationalised. Iron folate for adolescent girls and children, with de-worming. Implementation hurdles should be removed by streamlining delivery. –Nutrition education for health professionals, ICDS workers, and ASHA (Accredited social health activist). MOH, WCD.
2. Access to iodised salt. Double fortified salt (DFS), should replace iodised salt, now that PFA clearance for its production and marketing has been given (August 29 gazette order from MOH). Problems of reaching the unreachable should be addressed–Ministry of civil supplies, private manufacturers.
3. Bi-annual vitamin A massive dose, especially in areas where vitamin A deficiency symptoms like Bitot spots and night blindness are high. –Administrative efficiency to ensure supply–MOH.
4. Interventions like, at least 3 antenatal checkups, institutional deliveries, detection and treatment of anaemia, pregnancy induced hypertension (PIH) and infections in pregnancy have resulted in some reduction in maternal morbidity, mortality and perinatal mortality. But neonatal mortality continues to be high. Access to essential new born care is necessary to reduce NNMR and IMR. The goal should go beyond child survival to child health and nutrition. –MOH, WCD.

## **Increased Availability and Access to Variety of Foods**

1. Environmentally sustainable, nutrition oriented cropping pattern, using a blend of time-tested conventional and new technologies with appropriate safety checks. - Awareness and education of agriculture professionals at all levels and community—Ministry of agriculture (MOA), ICAR, State agriculture universities, MI&B.
2. House-hold food and nutrition security through decentralised, nutritionally oriented cropping pattern, homestead production of nutrient-dense vegetables, fruits, and animal products—poultry, dairy, fishery. Home grown food can ensure livelihood security, reliable and affordable food security and reduce rural urban and gender divide. - Awareness and education of agriculture professionals at all levels—MOA, ICAR, State agriculture universities, I&B.
3. Nutrition dimension should be main-streamed into national missions like Horticulture, Food security, NREGA and Rural Health Mission, with defined input and output parameters for monitoring. NREG scheme should be well structured to create assets that would help ecology and nutrition and develop skills. S&T institutions should be involved in its execution. -MOA, Ministry of rural development (MRD), MOH.
4. Orphan crops like millets should be revived. Increase in production of pulses should receive high priority. -MOA, ICAR, State agriculture universities, MI&B.
5. Efforts need to be made to bridge the gap between actual and potential productivity of all crops. -MOA, ICAR, State agriculture universities, MI&B.
6. Community gene, seed, grain and water banks, and crop livestock integrated farming will enhance nutrition security in dry land areas. - Agriculture extension, MOA, ICAR, State agriculture universities.
7. Post harvest technologies including establishment of modern silos, and food processing for value addition should receive high priority to prevent wastage of farm produce and generate employment. -MOA, MRD, Ministry of food processing industries (MFPI).
8. Public distribution system should be strengthened and basket of commodities increased to include millets, pulse and oils. -Ministry of civil supplies.
9. Export of Soya bean products should be stopped till availability of other pulses improves. Soya bean can be used to fortify wheat flour and other vehicles. - MOA, MFPI, Civil supplies.

## **Water, Health, Sanitation, Health Care Outreach**

1. Personal hygiene, environmental sanitation, safe drinking water and food safety. -IEC, Ministry of rural development, urban municipalities.
2. Nutrition should be an important outcome indicator in water and sanitation programmes and missions.

3. Budget for health should be increased from the present 0.9% GDP to 3% GDP and strategies for absorbing it by strengthening public health should receive attention. Either a separate department of public health under the Ministry of Health or separate cadre for public health with defined roles and career definitions should be created. Centre state roles in public health should be defined.

### **Nutrition Monitoring and Surveillance**

Mechanisms for Nutrition monitoring and surveillance have to be set up. Currently the NNMB functions in project mode in only 9 states. It should become a permanent institution under the ICMR, cover the entire country and include Nutrition Surveillance as an additional dimension.

### **Information, Education, Communication**

1. Nutrition education should be an important component of school education as well as medical, public health, agriculture, social science, management and other courses. - HRD, MOH, MOA.
2. Nutrition awareness to prevent under nutrition as well as obesity and chronic diseases should be taken up in a big way through multi-media channels, using icons for social marketing. To tackle the rising problem of obesity and chronic diseases, facilities for exercise and walk should be created in urban areas, and all schools should have physical education and games as component. These can be stress busters. Industries should make available healthy choices. -Multimedia educational blitz. -MIB with software inputs from professionals.
3. Dietary guidelines for Indians should become a household document for planning healthy diet and it should be translated in all languages. -MWCD. MI&B.

Since every programme and mission cannot start assessing nutrition status, they can use the data on child nutrition from the local ICDS and National Nutrition Monitoring Bureau to monitor the impact of their programmes on nutrition. There can be a small cell under each programme to coordinate this exercise.

### **The Bottom Line is:**

There should be a **National Nutrition Security Act**. Food Security Act (FSA) which envisages doling out food (cereals) at low price to BPL population is necessary to reduce hunger, but without other components of environment, safe drinking water and health care it may not impact nutrition. Besides, FSA is unlikely to improve the nutrition status of people above the poverty line, who are also undernourished, or impact on micronutrient deficiencies.

**Nutrition Security Mission should be moved from back burner to front burner.** Nutrition should be clearly stated as an important input and output parameter for judging development and should not be treated as trickle down beneficiary of economic and technological development. It should not get subsumed under curative or preventive health care in general, where emphasis tends to be on chronic diseases and immunization-important as they are. Without Nutrition, neither communicable nor non-communicable diseases can be prevented and hence it should have an important status as an independent entity. Malnutrition is the worst form of non-communicable disease. **Nutrition should become a priority issue at national and sub-national levels.** Leadership and efficient governance is required at all levels to ensure synergy through convergence between Programmes/ Missions/Acts which impact nutrition directly or indirectly (income, sanitation, drinking water, feeding programmes etc.) run by different departments/ ministries like health, women and child development, agriculture, civil supplies, education etc.

All planning and execution should be done with community participation and involvement of trained nutrition leaders from the community. There should be more scientific dialogue and interaction between nutrition scientists and scientists belonging to agriculture, medicine, public health, basic sciences and social scientists.

## PROGRAMME

Venue: INSA Auditorium, Bahadur Shah Zafar Marg, New Delhi

August 3-4, 2009

DAY 1		
9.30-10.30	REGISTRATION & TEA	
10.30-11.30	INAUGURATION <b>Chairman: Prof. M. Vijayan</b> <b>Chief Guest: Prof. M.S. Swaminathan</b>	
<b>Session 1</b>	<b>Chairpersons: Dr. Indira Nath, Dr. Manju Sharma</b>	
11.30-01.15	The Problem and Consequences of the Double Burden –A Brief Overview	<i>Dr Kamala Krishnaswamy</i>
	Food and Nutrient Intakes and Nutritional Status in the Rural Communities–NNMB Surveys	<i>Dr. GNV Brahmam</i>
	Role of Non-Dietary Factors–Environment, Drinking Water and Health Care Outreach	<i>Dr. T. Jacob John</i>
1.15-2.15	LUNCH	
<b>Session 2</b>	<b>Chairperson: Dr. S. Varadarajan</b>	
2.15-3.30	Anthropometric Measures of Pre-school Children in India: Some Unexplained Regularities	<i>Dr. Pronab Sen</i>
	Role of Non-dietary Factors–Lifestyle	<i>Dr Anura Kurpad</i>
3.30-4.00	TEA	
<b>Session 3</b>	<b>Chairperson: Dr. R.P. Sharma</b>	
4.00- 5.15	Government Programmes and Nutrition Security	<i>Dr. Prema Ramachandaran</i>
	Transgenic Technologies: Can They Impact Malnutrition?	<i>Dr. Deepak Pental</i>
<b>Session 4</b>	<b>Chairperson: Dr. I.P. Abrol</b>	
5.15-6.30	Value Addition to Food: Can it Encompass Total Nutrition Security (TNS)	<i>Dr. V. Prakash</i>
	Salt Fortification for Micronutrient Security	<i>Dr. B. Sesikaran &amp; Dr. S. Ranganathan</i>
DAY 2		
10.00-10.30	TEA	
<b>Session 5</b>	<b>Chairpersons: Dr. T. Ramasami, Dr. Anupa Sidhu</b>	
10.30- 01.00	Gendered Empowerment for Nutrition Security	<i>Dr. T. Rama Narayanan,</i>
	Summary of the Proceedings	<i>Dr. Mahtab S. Bamji</i>
	Panel Discussion/Brainstorming	<i>Speakers, panellists and audience</i>
	Concluding Remarks	<i>Dr. T. Ramasamy</i>
1.00	LUNCH	
RAPORTEURS		
Inauguration	Dr. Veenu Seth	
Session 1	Dr. Pulkit Mathur	
Session 2	Dr. Ravinder Chaddha	
Session 3	Dr. Kalyani Singh	
Session 4	Dr. Shipra Gupta	
Session 5	Dr. Veenu Seth and Dr. Salila Thomas	