

## Can a malnourished nation become a sporting nation?

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Judging by the justifiable euphoria over the medals that Indian athletes won in the Commonwealth Games in 2010, and their performance in Asiad 2010, one would be tempted to conclude that despite all the noise about India being among the world's most malnourished countries, it can still do well in sports. According to a report of Save the Children organization (quoted in *The Hindu*, 14 October 2010) Commonwealth countries share the common curse of underweight children. Thus according to the report, 64% of the world's underweight children live in 54 countries of the Commonwealth. The Commonwealth Games is a competition between countries (barring a few), which share the dubious distinction of being among the most undernourished nations of the world, and hence is not the best to judge with respect to performance. The same holds for most Asian countries. That India got more gold medals than England, Canada and New Zealand is a matter of pride, but considering the size and population of India, it should produce a much larger crop of athletes. Let us not forget that in the Olympics India just about does not exist. In the last Olympic Games, India got just one gold medal in shooting. The country needs to do much better in gymnastics, where there are over 100 events and a good opportunity for competition. India is often clubbed with China as a rapidly growing economy. Indeed it has done rather well on the economic front. But alas, unlike China, India has got its priorities wrong and is at the bottom of the pile of countries in social sectors like health, nutrition, education, gender equality, etc. as revealed by the Human Development Index and Global Hunger Index. The 2010 Global Hunger Index ranks India at 67 out of 122 developing countries. Serious hunger exists in all states. 'India is home to 42% of the world's underweight children.' Our policy-makers and planners have regarded these indicators as trickle-down beneficiaries of economic growth. We have waited for 63 years to test this hypothesis. It is time the strategy is changed.

When the question of India's poor standing in the area of sports is raised,

blame is put on a variety of factors like lack of sports culture except for cricket, not enough encouragement and funding, poor training opportunities, inability to identify talent at an early age, inability to nurture sports in schools, corruption, etc. Important as these are the basic fact that a malnourished nation cannot be a sporting nation is totally lost sight of. Vast segments of people in India, particularly those residing in villages where the talent lies, are malnourished and in poor health. Sports, particularly athletic events, require robust physical build. Indians in general are short in stature and have weak physical build, primarily due to chronic malnutrition. This has been quoted as a reason for doping to improve performance – the most recent scandal (*Mail Today*, New Delhi, 12 July 2011).

### No health without good nutrition

Most often, nutrition gets subsumed under health, and health interventions concentrate on communicable and non-communicable diseases. Important as they are, without proper diet and good nutrition, neither the communicable nor the non-communicable disease can be controlled. Over the years, some improvement has occurred in reducing mortality (Table 1). But the resistant problem of malnutrition continues to defy solution. Thus almost 30% infants have low birth weight (less than 2.5 kg). Almost 50% preschool children suffer from protein calorie malnutrition as judged by anthropometric indicators like wasting and stunting (Table 1), with little improvement in the past decade. Almost 30% adults are also undernourished as judged by the body mass index (weight/height<sup>2</sup>). There is rampant deficiency of micronutrients (vitamins and minerals), iron deficiency anaemia (50–70%), iodine deficiency and vitamin A deficiency being of particular concern. Deficiencies which are knocking at the door to be recognized on the basis of recent evidence are: vitamin D deficiency (despite the tropical sun), B-vitamins (folic acid, B<sub>12</sub> and B<sub>2</sub>) and zinc.

Undernutrition impairs growth, immunity and productivity in day-to-day life, leave aside performance in sports which

demands strength, stamina, concentration, etc. A panel of Noble laureate economists gives high priority to nutrition for development. Thus of the top ten priorities selected for development, five were in the area of nutrition – micronutrient supplements, micronutrient fortification, biofortification, de-worming and other nutrient programmes at school and community level (Copenhagen consensus, 2004). India's progress towards the Millennium Development Goals (UN Millennium Summit in 2000), of which the first one is to eradicate extreme poverty and hunger, is tardy. China and even Vietnam have surpassed the goal.

### Food security versus nutrition security

For nutrition security, there has to be awareness and physical, economic and social access to age-appropriate balanced diet, clean drinking water, safe environment and primary healthcare for all. Nutrition literacy is needed at all levels – politicians, planners, policy-makers, administrators, media, health, agriculture and other professionals. Public at large need to appreciate the problem and plan for nutrition security, which goes beyond food security. *Food security* is often interpreted as having adequate stocks of cereals – rice and wheat at national level rather than ensuring a balanced diet at household and individual level. A balanced diet has to have the right blend of cereals, legumes (dals), vegetables, fruits and foods of livestock origin – milk, eggs, meat, fish, etc. Apart from fine cereals like rice and wheat, consumption of coarse grains like maize and sorghum (jowar) and millets like pearl millet (bajra), finger millet (ragi) and minor millets has to be encouraged as these are rich in nutrients and fibre. These nutritious grains are being forgotten from production to consumption, thanks to price support policies. Cultivation of millets needs lesser water and they are more resistant to climate change. Their productivity needs to be enhanced through agriculture research, and the 2–3-fold gap between experimental and farm-level productivity should be bridged to make

**Table 1.** Time trends in mortality, nutrition and health indicators – India

Year	Under 5 mortality rate	Infant mortality rate	Percentage of infants with low birth weight	Infants breast-fed with complementary feeding 6–9 months	Percentage of under 5 under weight (weight for age)	Percentage of under 5 wasting (weight/height)	Percentage of under 5 stunting (height/age)
1990	116	83	–	–	–	–	–
2008	69	52	–	–	–	–	–
1990–1997	–	–	33	31	53	18	52
2003–2008	–	–	28	57	48	20	48

Source: UNICEF, Status of World's Children.

them economically viable for the farmer. Millets have become the focus of some of the recent World Bank-supported National Agriculture Innovation projects of ICAR.

### Malnutrition and disease

Malnutrition–infection is a vicious cycle. Undernutrition compromises immunity and predisposes to infection, which in turn depletes the body of nutrients. Countries in transition like India are facing the double burden of the pre-transition diseases like undernutrition and infection, and post-transition degenerative diseases like obesity, and associated conditions like diabetes, hypertension and cardiovascular diseases (CVD), cancer and arthritis. India is the diabetic capital of the world. CVD hits Indians (South Asians) at a younger age than in other countries. Research during the last two decades has suggested a link between undernutrition at the foetal stage and increased susceptibility to the above-mentioned age-onset degenerative diseases like diabetes and CVD. Intra-uterine nutritional deprivation (resulting in low birth weight) affects foetal programming and body composition. Babies born to malnourished mothers tend to have low birth weight. Such individuals have higher percentage of body fat than babies born to well-nourished mothers. Indulgence in later life (sedentary lifestyle, high-fat, low-fibre, refined diet, which would be the lot of individuals who move up from rags to riches in a fast developing economy), predisposes to obesity (Indian pot-bellies), diabetes and CVD. Obesity also aggravates arthritis. To break this multigenerational cycle, nutrition and health of girls has to be ensured from birth. A low birth-weight baby has to be rehabilitated nutritionally within the first year, through simple

measures like introduction of breast milk within 1 h of birth, exclusive breastfeeding for 6 months, introduction of complementary food after 6 months while continuing to breast feed for 1–2 years. This is a low-cost intervention needing mass awareness campaign.

This is not to say that good nutrition is not needed after that. Adolescents, pregnant and lactating women all have special nutritional needs and have to be nurtured with care.

### Indian diets and malnutrition

Visit a village in South India and see a child eating. Invariably it will be a pile of rice, with little chutney or some vegetable or little dal. In North India, a roti may replace rice. Surveys done by the National Nutrition Monitoring Bureau, run by the National Institute of Nutrition (NIN), Hyderabad, under the Indian Council of Medical Research and some other surveys show that Indian diets are qualitatively deficient in micronutrients (vitamins and minerals), and within a family diets of preschool children are most deprived, primarily because of ignorance of a child's dietary needs and lack of time for the mother to feed frequent small meals.

Among the variety of vegetables, green leafy vegetables are a treasure trove of micronutrients. They are easy to grow, available throughout the year and cheap. There is rich variety as well. Horticulturists have given little importance to this precious resource. Orange, yellow vegetables and fruits (carrot, papaya, yellow pumpkin, mangoes) are rich in pro-vitamin A (beta carotene). Fruits, particularly citrus fruits, amla (Indian gooseberry), guava and tomato are rich in vitamin C, which is a good antioxidant. Vitamin C promotes iron absorption and hence helps prevent anaemia. With little knowledge

and understanding, agriculture can be nutritionally oriented. Vegetables and fruits are also rich in health-promoting phyto-chemicals which protect against age-onset degenerative diseases.

### Access to clean water, sanitation and health care

According to the UNICEF report (The State of the World's Children, 2009), access to drinking water in India has shown improvement. In 2006, 89% of the population (96 urban and 86 rural) had access to clean drinking water. But the story is different on the sanitation front. In 2006, only 28% of the total households had access to clean sanitation – urban 52, rural 18. With such an environment, health is a casualty. Use of latrines in India is poor, particularly in rural areas. Also health-care outreach is unsatisfactory. Despite the large number of government hospitals, Primary health centres (PHCs) and primary health sub-centres, use of private hospitals and practitioners is preferred due to the perception of better care in the private sector.

### What is the way forward?

First and foremost, malnutrition should be recognized as a priority area to be addressed on a war footing. However, neither the government nor the scientific community can be faulted for not acting. Some of the largest supplementary feeding programmes like the feeding component of the Integrated Child Development Scheme (ICDS), and more recently, the Mid-day Meal (MDM) programme have been initiated and quantum of supplements scientifically determined. Unfortunately, neither of them mentions improvement in nutrition status of the children as a stated objective. MDM is to

improve school attendance, which it seems to have done, in some states at least. ICDS has not had the expected impact on child nutrition. One of the reasons is that the younger and the most vulnerable infants (6–24 months old) escape the feeding effort since the take-home food is shared by the family. Imaginative approaches to ensure that this age group gets the supplementary food are needed. In some states, anganwadis (ICDS centres) are non-functional.

For combating micronutrient deficiencies, there are four approaches: Pharmaceutical approach of giving tablets/syrups; food fortification; biofortification and dietary diversification. The anaemia prophylaxis programme which involves giving iron and folic acid supplements to pregnant women and preschool children (more recently adolescent girls), has failed to reduce the incidence of anaemia, the major bottleneck being implementation and compliance. Fortunately blindness due to vitamin A deficiency is now a clinical rather than a public-health problem. This, despite the fact that the massive-dose vitamin A supplementation programme which was launched to reduce blindness due to vitamin A deficiency, suffers from the infirmities of other supplementation programmes. Some nutrition scientists have questioned its continuation, but since dietary deficiency, milder clinical forms and biochemical deficiency of vitamin A persist and the health effects of vitamin A go beyond ocular lesions, it should be continued, at least in high-prevalence areas. Administrative and socio-cultural bottlenecks need to be examined and removed. Better inter-departmental convergence, and partnership with NGOs and the private sector may improve the outreach.

One of the success stories in India is reduction in the incidence of iodine-deficiency disease (goitre), after the introduction of iodized salt. Recently, NIN has developed iron-fortified iodized salt (double-fortified salt). Government order for its production has been issued. Double-fortified salt should rapidly replace iodized salt so that deficiency of iron and iodine can be addressed. Other options for fortifying foods like cereals with micronutrients, as done in many other countries, have to be tested. However, these measures are preventive in nature and will not cure moderate and

severe forms of anaemia. These have to be treated.

Biofortification is a seed-based approach where the germplasm is enriched with a mineral or vitamin using conventional cross-breeding technology – crossing a high-yielding variety with a variety naturally endowed in the micronutrient. The process can be hastened by doing marker-driven molecular breeding. Rice, wheat, maize and pearl millet, rich in iron and zinc, and vegetables like sweet potato and cassava rich in beta carotene (provitamin A) have been developed using molecular breeding. This method is not controversial and the products developed should be quickly subjected to large-scale field trials and released. Seed-based approach is sustainable and cheaper, provided seed companies are not allowed to exploit. The other approach is genetic engineering, where a favourable gene is transferred from some other species – food or non-food, to the vegetable or food grain. Golden rice rich in beta carotene is one such product. This approach has immense possibilities but has to be exploited cautiously, ensuring safety for health and environment.

Perhaps the most effective but least tried approach is the Gandhian approach of decentralized planning for food security at village and household level, through homestead gardens, backyard poultry, dairy, fish pond, etc. The forgotten millets have to be revived and greater thrust towards production of pulses has to be given through increasing the area and productivity. Homestead production of foods even in urban areas has been successfully tried in countries like Cuba. Huge wastage of food due to inadequate storage and processing facilities needs immediate remedial measures. Wasting food when people are hungry is travesty of justice. Eminent nutrition scientist C. Gopalan has often said that ‘farm-based approach is more sustainable than a pharmacy-based approach’. It empowers the community.

### **Nutrition not the vision of the missions**

The objective of nutrition security with stated goals and parameters of measuring are missing from a host of missions like the National Food Security Mission, National Horticulture Mission (emphasis being on income and export) and

National Rural Health Mission (emphasis on communicable and non-communicable disease). The Food Security Bill – a diluted version of The National Advisory Committee’s recommendation for food security only includes cereals and millets. Inclusion of millets is to be appreciated. However, as mentioned earlier, food security demands access to other items of food such as pulses, vegetables, fruits, animal products and oil. Nevertheless, it is a step in the right direction. If money can be freed from the burden of buying cereals even partially, it can be diverted for other foods. The Public Distribution System should widen its food basket through inclusion of at least pulses, millets and some oil. Some states are doing the same.

Several programmes, missions and acts like the National Nutrition Policy (1993), the National Nutrition Plan of Action (1995), and the National Nutrition Mission (2001) have remained on paper. More recently, a Coalition for Sustainable Nutrition Security under the leadership of M. S. Swaminathan has made recommendations for agenda for action. The Indian National Science Academy, New Delhi, one of the highest scientific bodies in India, has recently released two papers; ‘Nutrition security for India – issues and the way forward’ – a position paper (2009) and ‘Micronutrient security for India – priorities for research and action’ (2011) based on detailed scientific deliberations. Let us hope that the recommendations are heard and implemented. The Prime Minister of India, Manmohan Singh has called malnutrition a curse and constituted a National Council on India’s Nutrition Challenges. It at least attempts inter-departmental convergence, but includes mostly politicians and administrators. Hope the story of starting with a bang and ending in a whimper is not repeated.

India cannot hope to become a sporting nation without adequate attention to nutrition of its people. Let us channelize the energy of our youth from violence to sports, by making right decisions and implementing them. Doping scandals do not make us proud.

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