Malnutrition, an Emergency: What it Costs the Nation

Veena S. Rao

First Edition: February 2008

ISBN: 978-81-7525-933-1

Published by
Council for Advancement of People's Action and Rural Technology (CAPART)
Zone 5 A, Core C, India Habitat Centre, Lodhi Road, New Delhi-110003
Ph- 011- 24642395, Telefax- 011- 24648607

Email: capart@caparthq.delhi.nic.in

Printed at: Sita Fine Arts Pvt. Ltd., A-22, Naraina Industrial Area, Phase-II. New Delhi-110028
Email: sita.printer@gmail.com

CONTENTS

Preface		i
Acknowledgements		iii
Executive Summary		v
1	Introduction	1
2.	Indicators for Assessing the Nutritional Status of the Population	4
3.	International Comparisons	19
4.	Inter-generational Cycle of Malnutrition and Ill health: Its Consequences	20
5.	What does Malnutrition Cost the Nation	24
6.	State Responses: Malnutrition in the Five Year Plans	34
7.	Policy Instruments: National Nutrition Policy 1993	40
8.	Present Direct and Indirect Intervention Programmes	43
9.	CAPART's Strategy towards Combating Malnutrition using the Life Cycle Approach	48
10.	Pilot Projects: Jawhar and Mokhada Blocks, Thane District, Maharashtra	50
11.	Project Status: Response of the Community	53
12.	Opportunities Lost: The Way Forward	62
Bibliography		73
Abbreviations and Glossary		76

List of Tables

Table 2.1	:	Infant Mortality Rate in India and selected States	5
Table 2.2	:	Under Five Mortality Rate in India and major States	6
Table 2.3	:	Stunting/ Wasting/ Underweight among children Under 3 years in India and major States	8
Table 2.4	:	Anaemia among Children in India and major States	10
Table 2.5	:	Immunization Status and Vitamin A coverage of Children in India and major States	11
Table 2.6	:	Maternal Mortality Ratio in India and major States	13
Table 2.7	:	Access to Health Care Facilities by Women	14
Table 2.8	:	Malnutrition among Women in India and major States	15
Table 2.9	:	Households with access to toilet facilities and safe drinking water	16
Table 2.10	:	Body Mass Index and Anaemia among Men and Women in India and major States	18
Table 3.1	:	Development Indicators for India and other countries	19
Table 4.1	:	Causes and Consequences of Malnutrition for Infants, Adolescent Girls and Women	23
Table 5.1	:	Assumptions used for cost analysis of Malnutrition	31
Table 5.2	:	Productivity loss due to various deficiency disorders – Assumptions	31
Table 5.3	:	Estimated annual productivity losses due to nutritional deficiencies	32
Table 5.4	:	Productivity Losses due to Malnutrition in India	33
Table 8.1	:	Present Direct and Indirect Nutrition Intervention Programmes	43
Table 11.1	:	Findings of Baseline Surveys in Jawhar and Mokhada	53
Table 11.2	:	Weight Monitoring of Children in Jawhar and Mokhada Blocks	56
Table 11.3	:	Weight Monitoring Results for Adolescent Girls	57

Table 11.4 : Weight Monitoring Results for Pregnant Women 58
Table 11.5 : Weight Monitoring Results for Lactating Women 59
Table 11.6 : Response from Lactating Mothers and Pregnant Women 60
Table 11.7 : Response from Adolescent Girls 60
Table 11.8 : Response from Children 6 years and above 61
Table 11.9 : Response from mothers of Children below 3 years 61

List of Figures

Figure 2.1 : Causes of Infant Mortality 6
Figure 2.2 : Causes of Maternal Mortality in India 13
Figure 4.1 : Inter-generational Cycle of Malnutrition and Ill health 21
Figure 5.1 : Productivity Losses due to Malnutrition 29

List of Annexures

Annexure 1 : Nutrition/Immunization Indicators and Female Education Level 79
Annexure 2 : Promotion of Community Initiatives to Combat Malnutrition and provide Income Generation in the Backward Regions of India 81
Annexure 3 : Recipe of Weaning Foods for Infants and Children 89
Annexure 4 : Recipe of Enriched Mix for Adolescent Girls, Pregnant and Lactating Mothers 91
Annexure 5 : Grades of Malnutrition 92
Annexure 6 : National Nutrition Policy 1993 93

Blank

डा. रघुवंश प्रसाद सिंह
DR. RAGHUVANSH PRASAD SINGH

ग्रामीण विकास मंत्री
भारत सरकार
कृषि भवन, नई दिल्ली – 110 114
MINISTER OF RURAL DEVELOPMENT
GOVERNMENT OF INDIA
KRISHI BHAWAN, NEW DELHI-110 114

Preface

I am extremely pleased that the Council for Advancement of People's Action and Rural Technology has brought out this publication on the subject of malnutrition. As has been brought out through several Surveys, the latest being National Family Health Survey-3, malnutrition is an invisible health problem which is attacking a sizeable portion of our human resources, especially the rural poor. Malnutrition is a major obstacle in enabling our people to achieve their complete physical and cognitive potential. It especially deprives the rural poor of energy and capacity to work, thereby causing low productivity, low income and continuation of poverty.

I congratulate CAPART for formulating a strategy for combating malnutrition and for implementing this strategy through two Pilot Projects in the chronic malnutrition Tribal Blocks of Maharashtra. I am indeed happy to learn that even in the early stages of implementation, the nutrition situation of the tribal people has improved. I greatly appreciate the keen enthusiasm of Director General, Smt. Veena S. Rao for providing the benefit of her accumulated knowledge and experience on the subject for the benefit of the NGOs and the rural communities of India.

I am also happy that the newly established CAPART Institute for Poverty Alleviation and Rural Technology (CIPART) has already conducted several training programmes for NGOs across the country on the eradication of malnutrition based on the CAPART Strategy.

I sincerely hope that the pilot project is upscaled to a National Programme which will improve the Human Resource base of our country and enable the rural poor to improve their health and nutritional status, thereby improving their productivity and income, and correspondingly reducing poverty.

(Raghuvansh Prasad Singh)

Blank

Acknowledgments

This publication is the result of the knowledge and insights I gained during my tenure as Joint Secretary in the Department of Women and Child Development regarding the generally ignored and often misunderstood phenomenon of malnutrition in India. What appeared to me as inexplicable was that in spite of this huge human resources calamity staring us in the face, and the enormous loss that it was causing to the country and to the people, the subject never received the attention that it ought to have in the nation's development agenda.

I was fortunate to have been given an opportunity in CAPART to implement a pilot project following the inter-generational strategy and put to test a hypothesis that I had carried with me for some time. It is a feeling of great satisfaction that the hypothesis is being validated in the manner that I expected. Thank you, CAPART.

I would like to express my sincere thanks to the Hon'ble Minister for Rural Development and Chairman CAPART, Dr Raghuvansh Prasad Singh, for his encouragement and support in this project.

My special thanks to Ms. Shweta Singh who has worked closely with me in documenting this publication. She painstakingly compiled the information and updated it several times over, as we went through 2007 with new data pouring in from NFHS-3, Census of India 2001, SRS and NSSO. Ms. Shweta Singh also assisted me in collating and analyzing the data and in designing the training module and course material for the training programme "Combating Malnutrition and Production of Energy Rich Foods for Consumption and Marketing in Rural Areas" for NGOs at the newly set up CAPART Institute for Poverty Alleviation and Rural Technology (CIPART). Already 57 NGOs from all over India have been trained.

My thanks also to Dr. Robert W Fogel, Director, Center for Population Economics, University of Chicago, Graduate School of Business for permitting me to use his hypothesis from "The Conquest of High Mortality and Hunger in Europe and America, NBER Working Paper No 16", for the paper.

I would also like to thank Ms. Lakshmi Prasad, Deputy Director General CAPART, Shri S. H. Indurkar, Deputy Director, CAPART and Shri P. K. Gupta, Research Officer,

who were handling this project, and Shri K. Kalyana Raman, my Private Secretary, for his secretarial assistance.

I am extremely grateful to Dr. Werner Schultink, Chief, Nutrition Section, UNICEF, New York, for reviewing the paper and providing his valuable comments and suggestions. I express my gratitude to Dr. Chandrakant S Pandav, Professor and Head, Centre for Community Medicine, AIIMS for sharing his data regarding salt iodization at household level, and reviewing this paper. I would also like to thank Dr. A.K. Gopal and Ms. Meenakshi Sood of NIPCCD for their valuable inputs regarding ICDS and related data.

Lastly and most importantly, I must express my gratitude to Dr. N.G. Hegde, President, BAIF Development Research Foundation, Mr. Ramesh Rawal, Vice President, BAIF Development Research Foundation, Dr. Shailesh Deshpande, Joint Programme Director, Mr. S.M. Wagle, Principle Programme Coordinator, MITTRA, for implementing the pilot projects with all sincerity and commitment.

Veena S Rao

New Delhi
2008

Executive Summary

1. The objective of this paper is to highlight the epidemic proportions of malnutrition that have been silently raging in India. The latest NFHS 3 data presents a grim situation regarding the nutritional status of our population. This has, time and again, been confirmed by various other surveys, such as, NSSO, NNMB, and by International Publications, such as, the Human Development Report 2007 and the Global Hunger Index. In spite of the poor nutritional status of the population, particularly of children and women, the subject has not caught much attention of the highest policy and decision makers. After the National Nutrition Policy (1993) and the National Plan of Action for Nutrition (1995), the recommendations of which have mostly remained on paper, no national reviews, assessments or programmes regarding combating malnutrition have emerged. Through this paper an attempt has been made to draw the attention of the decision makers towards the problem of malnutrition, its manifestation and inter-generational and economic consequences that normally remain invisible, and work out strategies to address this problem, in a practical, sustainable and time bound manner.

2. Sections 1 and 2 discuss the Direct and Indirect Indicators of Malnutrition, and the Indian Scenario in relation to these indicators. Infant Mortality Rates, Maternal Mortality Rates, Birth Weights are some of the indicators that are used to assess the nutritional status of the population. India has a high Infant and Maternal Mortality Rate and almost one quarter of the children born in India are low birth weight. 61.3% and 67% of the causes for high infant and maternal mortality respectively, are related to malnutrition and its manifestations, depicting inadequate food intake, lack of access to basic health care, poverty, ignorance, gender inequality, lack of immunization, prolonged infections, lack of sanitation and access to clean drinking water among a vast majority of our population.

3. Section 3 provides a comparative picture of nutrition related indicators of India with other countries. Despite our high rate of growth in the last decade, improvement in the nutritional status of the population has been marginal as compared with countries like China, Sri Lanka and Bangladesh. For certain indicators such as Stunting and Wasting of children, India's indicators are worse than those of Sub Saharan countries, such as, Ethiopia, Angola, Sudan and the Congo (Democratic Republic).

4. Section 4 discusses the Inter-generational Cycle of Malnutrition and Ill Health and its consequences. Malnutrition is an extremely complex phenomenon with multiple and

heterogeneous causes. To add to the complexity, the problem of malnutrition is invisible and is passed on from one generation to another, resulting in an inter-generational cycle of malnutrition and ill health. It is but logical that for an inter-generational problem, an inter-generational strategy promises greatest chances of success. However, this factor often escapes attention of the policy makers while formulating strategies and programmes to eradicate it. The package of interventions must be inter-sectoral and must cover the entire life cycle of women and children to create an immediate impact on the nutritional status of the three critical links of malnutrition, namely, children, adolescent girls, and women.

5. Section 5 throws light on the economic repercussions and dimensions of malnutrition. Malnutrition retards the physical and cognitive potential of human beings resulting in reduced working and earning capacity among adults, impaired learning potential among children, reduced capacity to recover from illness, thus, eroding a sizeable portion of our human resources. Collectively, this negatively impacts economic development (GDP) with high mortality and morbidity rates adding to the health costs of the nation. The paper also calculates the GDP losses arising out of calorie deficit of the population based on the NSS 50th Round findings.

6. Sections 6, 7 and 8, address the inadequacy and inappropriateness of State responses, and the apparent lack of administrative and political will to put in place a viable and time bound solution to the problem of malnutrition. The National Nutrition Policy, though a most comprehensive document, failed to get implemented, and the National Plan of Action remained largely on paper due to lack of resources and proper monitoring mechanisms. The Minimum Needs Programme (MNP) 1974 with 8 basic minimum services was considered as the core of the Social Sector Development Plan. While all the components of MNP, such as, Elementary Education, Rural Health, Rural Water Supply, Rural Electrification, Rural Roads and Rural Housing subsequently became national programmes, the subject of Nutrition got subsumed in ICDS, lost its independent programmatic identity, and never became a stand alone programme by itself.

7. Sections 9 and 10, provide a strategy to combat malnutrition which is structured simply but innovatively, and derived entirely from the prescriptions already existing in our Plan and Policy framework, that have, however, remained unattended since several decades. CAPART, an autonomous body under the Ministry of Rural Development, Government of India, with a mandate of funding NGOs, prioritized the issue of Malnutrition as an unaddressed gap in human resource development, and formulated a Model Scheme for Promotion of Community Initiatives to Combat Malnutrition and provide Income Generation in the Backward Regions of India. The Scheme is constructed on the principles of the Inter-generational, Life Cycle Approach, with interventions to address the key stages of

the life cycle, viz., infancy and childhood, adolescence, and motherhood, through nutritional and health awareness and dietary supplementation by low cost, indigenous energy food, locally prepared by Women's Self Help Groups. The scheme serves a dual purpose of combating malnutrition as well as providing income generation activity for the Women's Self Help Groups, who produce, distribute and market the energy foods in the community. Based on this Scheme, two Pilot Projects have been undertaken in the Tribal Blocks of Jawhar and Mokhada in Thane District, Maharashtra that suffer from chronic malnutrition. CAPART is implementing these projects jointly with an NGO, MITTRA- BAIF.

8. Section 11 discuss the findings of the Baseline Surveys, the progress in the implementation of the projects and the dramatic improvement in the nutritional status of the target groups thereafter. The awareness generation campaigns regarding the Inter-generational Cycle of Malnutrition have been well received by the community. Production Centres for energy food specifically customized to meet the nutritional requirements of infants, children, adolescent girls, pregnant and lactating mothers have been set up. Consumption of energy foods by children began in July 2007 and by adolescent girls and women in September 2007. The Section also discusses the extremely positive impact on the health and well being of the community after the consumption of energy foods, as expressed through questionnaires.

9. The Concluding Section suggests a blue print for a National Programme to Combat Malnutrition. Beginning with enhanced political commitment, it seeks to revitalize the dormant National Nutrition Council headed by the Prime Minister and urges it to set up a High Powered Committee to formulate a National Programme to Combat Malnutrition. The programme components suggested are Awareness Generation, Supply and Popularization of Low Cost Nutritious Energy Foods, Food Fortification, and a strong Monitoring and Evaluation system. The implementation machinery is the ICDS with a revised mandate and additional flexible support - either trained assistants at the Anganwadi level, or support of trained NGOs or SHGs, depending upon their presence and strength. To begin with, the programme can be implemented in 150-200 chronically malnourished Blocks. The cost incurred to combat malnutrition would be much less than what malnutrition costs the nation.

1

Malnutrition, an Emergency: What it Costs the Nation

The objective of this paper is to highlight the epidemic proportions of malnutrition that have been silently raging in India. The paper tries to explain the phenomenon of malnutrition with all its multi-sectoral and inter-generational complexities. Each time the grim statistics of National Surveys on Health and Nutrition are released, along with their several manifestations that negatively impact the lives of the people, the subject catches the momentary attention of policy and decision makers. But sustained priority attention resulting in concrete and cogent action to effectively address the challenge gets lost in the quagmire of governmental processes, and all too soon, the issue becomes as invisible as malnutrition itself. This paper tries to explain the phenomenon of malnutrition in a social, societal, historical and economic frame-work, the inadequacy and inappropriateness of state responses thus far, and an absence of administrative and political will to put in place a viable and time bound solution to the problem. The paper also attempts a strategy to combat malnutrition which is structured simply but innovatively, and derived entirely from the prescriptions already existing in our Plan and Policy framework, that have, however, remained unattended since several decades.

1. Introduction

1.1 India today is one of the most malnourished countries of the world. The latest NFHS 3 findings not only establish this, but also assert that not much progress has been achieved during the last decade in improving the poor state of our human resources. Our HDI ranking, (128 in the Human Development Report 2007) has remained more or less static for the last decade (126 in Human Development Report 2006, 127 in the Human Development Reports 2003, 04, 05, and 139 in the Human Development Report 1998). India ranks 94 in the latest Global Hunger Index 2007 released recently by International Food Policy Research Institute (IFPRI). Though India's position has improved in the Index, it is still lagging behind China (47) and Pakistan (88). As per the Report, more than 40% of the world's underweight children below 5 years live in India. Amongst the major

factors that have prevented improvement in position are the high prevalence of Malnutrition and its several manifestations, the most visible of which are low birth weight, underweight, stunted and wasted children, unacceptably high infant and maternal mortality rates, and anaemia of almost epidemic proportion among women and children.

1.2 While our leadership, businessmen and economists celebrate our booming economy and GDP growth, not much concern or serious reflection followed the alarming statistics that the NFHS 3 reeled out in installments during 2007. Voices of concern came mostly from the media and the non-governmental sector. The operational ministries have not yet placed their responses in the public domain, even though the Prime Minister stated in his address to the nation on August 15, 2007,

> "The problem of malnutrition is a matter of national shame. We have tried to address it by making the mid-day meal universal and massively expanding the *anganwadi* system. However, success requires sustained effort at the grassroots. Infants need to be breast-fed, have access to safe drinking water and health care. We need the active involvement of the community and panchayats to see that what we spend reaches our children. I appeal to the nation to resolve and work hard to eradicate malnutrition within five years."

1.3 We may recall former leaders of their time making similar statements, namely, former Prime Minister Shri Atal Bihari Vajpayee who on Independence Day 2001 announced,

> "All of us know that democracy and hunger cannot go together. We shall therefore launch a National Nutrition Mission. Under this, subsidized food grains will be made available to adolescent girls and expectant and nursing mothers, belonging to below-poverty-line families. Cheaper foodgrains could also be provided to such religious, social, and educational organizations if they so require, that are engaged in mass-feeding programmes for the poor."

1.4 In his Republic Day address in 1998, Shri K.R. Narayanan, the former President sounded the alert that

> "In spite of the Green Revolution, it is an unfortunate fact that hunger and malnutrition persist in our rural as well as urban areas. There is need now to go beyond the Green Revolution and bring about a nutrition revolution in the country. The food and nutritional needs of the poor in India, especially of children and women, must be tackled."

1.5 More than 6 years have passed since Prime Minister Vajpayee's announcement, and we are no closer to a National Nutrition Mission or even to any national consultation to discuss the problem of malnutrition comprehensively and decide on the most effective and speedy strategy to eradicate it. After the National Nutrition Policy (1993) and the National Plan of Action for Nutrition (1995), the recommendations of which have mostly remained on paper, no national policy documents or programmes on eradicating malnutrition have appeared.

2

Indicators for assessing the Nutritional Status of the Population

2.0 Poverty is a prominent, but not the sole cause of malnutrition. Malnutrition is an extremely complex phenomenon with multiple causes, multiple manifestations, and is inter-generational. Its causes range from the physical, such as, poverty, hunger and under-nutrition, infection and disease, to poor governance, mainly, lack of health services, of safe drinking water and hygienic sanitation, and the socio-cultural, such as, gender-discrimination both in society and in family, particularly in terms of intra-family food consumption, early marriage of girls and frequent pregnancies, superstition and ignorance regarding proper maternal/child care and feeding practices.

2.1 Indicators for Assessing the Nutritional Status of Children

The nutritional status of a society can be judged by the following indicators:

2.1 (i) Low Birth Weight (LBW)

An infant weighing less than 2.5 kg at birth is said to be of low birth weight. As per NFHS 3, 21.5% of the infants born in India are of low birth weight. The figure for the same indicator as per Human Development Report 2007 is 30%. Lack of care of pregnant women, inadequate dietary intake, heavy work loads, lack of access to basic health care services, frequent pregnancies, lack of information about increased nutrient requirements during pregnancy are some of the reasons that result in low birth weight of the baby.

2.1 (ii) Infant Mortality Rate

This is defined as the probability of dying between birth and exactly one year of age expressed per 1000 live births. The following Tables indicate that there has been a marginal decline of around 1% per year nationally as well in some States, between the

Table 2.1: Infant Mortality Rate in India and Selected States

India/Selected States	Infant Mortality Rate SRS (2005)[a]	Infant Mortality Rate SRS (2006)[b]	Infant Mortality Rate, NFHS 2 (1998-99)[c]	Infant Mortality Rate NFHS 3 (2005-06)[d]
India	58	57	67.6	57.0
Assam	68	67	69.5	66.1
Bihar	61	60	72.9	61.7
Chhattisgarh	63	61		70.8
Jammu & Kashmir	50	52	65.0	44.7
Jharkhand	50	49		68.7
Kerala	14	15	16.3	15.3
Madhya Pradesh	76	74	86.1	69.5
Maharashtra	36	35	43.7	37.5
Orissa	75	73	81.0	64.7
Punjab	44	44	57.1	41.7
Rajasthan	68	67	80.4	65.3
Uttar Pradesh	73	71	86.7	72.7

Source: (a) SRS Bulletin October 2007, Vol. 42, No. 1 (b) SRS Bulletin October 2006, Vol. 41, No. 1 (c) NFHS 2 (1998-99) (d) NFHS 3 (2005-06)

time periods 1998-99 and 2005-06. However, by parameters of development, India's IMR continues to be unacceptably high and has not achieved the dramatic breakthrough that countries such as Bangladesh, China and Brazil have done. (see Table 3.1)

High IMR, just as low birth weight, prima facie, reflects poor health of women and children, poverty, inter-generational malnutrition and under-nutrition, ignorance of proper feeding practices, superstition, poor hygienic conditions, unsatisfactory or non-existent health service delivery systems, poor immunization coverage and low position of women in society. This can translate into pre-term birth, low birth weight, birth asphyxia (lack of oxygen), congenital abnormalities and infections. Maternal malnutrition can directly result in premature delivery. Maternal deficiency of Vitamin A and D can result in lack of immunity in the infant that in turn can cause pneumonia and acute respiratory infection in newborns, and diarrhoea.

Causes of Infant Mortality

The following figure presents the different causes for infant deaths in rural India, leading to a reasonable conclusion that 61.3% of infant mortality is related directly or indirectly to maternal/child malnutrition, viz., Prematurity (30%), Pneumonia (14.5%), Respiratory Infection (11%), Anaemia (2.9%), Diarrhoea (2.9%).

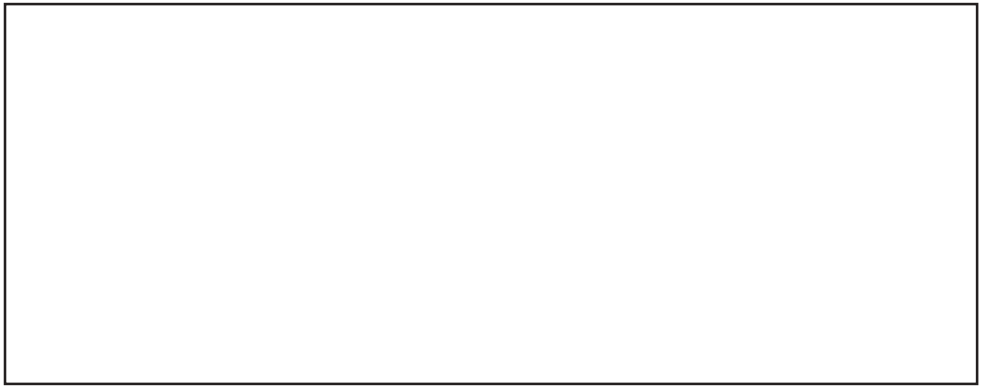


Figure 2.1: Causes of Infant Mortality

Source: India, Registrar General, Vital Statistics Division, (2000).

2.1 (iii) Under Five Mortality Rate

Under Five Mortality Rate is defined as the probability of dying between birth and exactly five years of age expressed per 1,000 live births. The Table below represents the Under five mortality rate for India and some major States for the years 1998-99, and 2005-06.

Table 2.2: Under Five Mortality Rate in India and Major States

India/ States	NFHS 2[a] (1998-99)	NFHS 3[b] (2005-06)
India	94.9	74.3
Assam	89.5	85.0
Bihar	105.1	84.8
Chhattisgarh		90.3
Jammu & Kashmir	80.1	51.2
Jharkhand		93.0
Kerala	18.8	16.3
Madhya Pradesh	137.6	94.2
Maharashtra	58.1	46.7
Orissa	104.4	90.6
Punjab	72.1	52.0
Rajasthan	114.9	85.4
Uttar Pradesh	122.5	96.4

Source: (a) NFHS 2 (1998-99) (b) NFHS 3 (2005-06)

The causes for the high Under 5 mortality rate are similar to those of IMR and LBW, with the factor of poverty compounded by factors such as low immunization rates, prolonged infections and diarrhoea, poor access to health services, safe drinking water and hygienic sanitation acquiring greater weightage. Though the Under 5 Mortality Rate (74.3) has improved by 2.6% in a period of 7 years, it is still far below the Under 5 Mortality Rate of countries such as China (27) and Sri Lanka (14).

2.1 (iv) Stunting/ Wasting/ Underweight

Stunting (deficit in height for age), Wasting (deficit in weight for height) and Under Weight (deficit in weight for age) are critical indicators for determining the nutritional status of children. Table 2.3 gives a comparative picture emerging from the NFHS 2 and NFHS 3 data.

The NFHS 3 data that 46% of children below 3 years of age are underweight, 38% are stunted and 19% are wasted, is a matter of grave concern for the optimal development of our human resources that are the greatest asset for any country. It is logical to forecast that this group of children will never achieve their complete physical and cognitive potential, will have poor health, and remain within the poverty trap as adults. In addition to the causes stated in connection with low birth weight and mortality rates, lack of exclusive breast feeding for the first six months, poor quality of breast milk on account of maternal malnutrition, delayed complementary feeding, inadequate calorie protein intake, poor caring practices, ignorance regarding proper dietary intake even within the purchasing power of the family, infections and disease, are predominant causes for the high percentage of underweight, stunted and wasted children.

It is equally a cause of concern that improvements in the indicators of stunted and underweight children within the last decade have been marginal nationally (less than 10% in a decade), and in certain States they have been negative (Karnataka [stunting], Bihar, Gujarat, Himachal Pradesh, Jammu & Kashmir, Jharkhand, Kerala, Madhya Pradesh, Punjab, Rajasthan, Tamil Nadu and Uttar Pradesh [wasting], Assam, Bihar, Gujarat, Jharkhand, Kerala, Madhya Pradesh, [underweight]). Though some States such as Assam, Bihar, Chhattisgarh, Himachal Pradesh, Jammu and Kashmir, Madhya Pradesh, Punjab and Rajasthan have shown improvement of more than 10% in reduction of stunting of children Under 3 and Underweight Children (Table2.3), the overall improvement continues to be marginal and the base lines remain high.

The most alarming finding however is that the percentage of children wasted has increased from 15.5% to 19.1% in the last decade. This would imply that there is something seriously amiss in the content and implementation of the ICDS, showcased as the largest childcare programme in the world, and that it requires urgent overhauling.

Table 2.3: Stunting/ Wasting/ underweight among Children under 3 in India and Major States

India/ Selected States	Key Indicators					
	Children under 3 who are stunted (%)		Children under 3 who are wasted (%)		Children under 3 who are underweight (%)	
	NFHS 3[a]	NFHS 2[b]	NFHS 3[a]	NFHS 2[b]	NFHS 3[a]	NFHS 2[b]
India	38.4	45.5	19.1	15.5	45.9	47.0
Assam	34.8	50.2	13.1	13.3	40.4	36.0
Bihar	42.3	54.9	27.7	19.9	58.4	54.3
Chhattisgarh	45.4	57.9	17.9	18.5	52.1	60.8
Gujarat	42.4	43.6	17.0	16.2	47.4	45.1
HimachalPradesh	26.6	41.3	18.8	16.9	36.2	43.6
Jammu & Kashmir	27.6	38.8	15.4	11.8	29.4	34.5
Jharkhand	41.0	49.0	31.1	25.4	59.2	54.3
Karnataka	38.0	36.6	17.9	20.0	41.1	43..9
Kerala	21.1	21.9	16.1	11.1	28.8	26.9
Madhya Pradesh	39.9	49.0	33.3	20.2	60.3	53.5
Maharashtra	37.9	39.9	14.6	21.2	39.7	49.6
Orissa	38.3	44.0	18.5	24.3	44.0	54.4
Punjab	27.9	39.2	9.0	7.1	27.0	28.7
Rajasthan	33.7	52.0	19.7	11.7	44.0	50.6
Tamil Nadu	25.1	29.4	21.5	19.9	33.2	36.7
Uttar Pradesh	46.0	55.7	13.5	11.2	47.3	51.8

Source: (a) NFHS 3 Fact Sheet (2005-06), (b) NFHS 2 (1998-99)

As stated succinctly in *India's Undernourished Children: A Call for Reform and Action, HNP Discussion Paper, 2005*, "The prevalence of underweight among children in India is amongst the highest in the world, and nearly double that of Sub-Saharan Africa. Most growth retardation occurs by the age of two, in part because around 30 percent of Indian children are born with low birth weight, and is largely irreversible. In 1998/99, 47 percent of children under three were underweight or severely underweight, and a further 26 percent were mildly underweight such that, in total, underweight afflicted almost three-quarters of Indian children, Levels of malnutrition have declined modestly,

with the prevalence of underweight among children under three falling by 11 percent between 1992/93 and 1998/99. However, this lags far behind that achieved by countries with similar economic growth rates."

The Paper goes on to state that disaggregation of underweight statistics by socio- economic and demographic characteristics reveals that underweight prevalence is higher in rural areas (50 percent) than in urban area (38 percent); higher among girls (48.9 percent) than among boys (45.5 percent); higher among scheduled castes (53.2 percent) and scheduled tribes (56.2 percent) than among other castes (44.1 percent); and, although underweight is pervasive throughout the wealth distribution, the prevalence of underweight reaches as high as 60 percent in the lowest wealth quintile. Another disturbing trend revealed in the paper is that during the 1990s, urban rural, inter-caste, male-female and inter-quintile inequalities in nutritional status widened.

Other observations brought out in the paper are that there is a large inter-state variation in the patterns and trends in underweight. In the six States of Maharashtra, Orissa, Bihar, Madhya Pradesh, Uttar Pradesh, and Rajasthan, at least one in two children are underweight,. The four latter States account for more than 43 percent of all underweight children in India. Statistics from these States also reveal that the prevalence in underweight is falling more slowly in the high prevalence states. Another fact highlighted in the Paper which is of great significance for combating malnutrition is that Undernutrition is concentrated in a relatively small number of districts and villages with a mere 10 percent of villages and districts accounting for 27-28 percent of all underweight children, and a quarter of districts and villages accounting for more than half of all underweight children. It is but logical, therefore, that any strategy to combat malnutrition must begin from here.

2.1 (v) Anaemia among Children

Table 2.4 indicates that there has been an alarming increase in the prevalence of anaemia in the national average and in all States except Chattisgarh, Jammu & Kashmir, Jharkhand, Maharashtra, Rajasthan.

High prevalence of anaemia also indicates that it is not limited to below poverty line population only. Its causes are heterogeneous, both for the poor as well as those with purchasing power. The major reasons for increased incidence of anaemia may be attributed to late complementary feeding, lack of awareness and information regarding the importance of iron rich foods for children, worm infestation, unsafe drinking water and poor sanitary conditions, prolonged infection and diarrhoea, lack of fortification and supplementation in the diets of the poor, and unhealthy eating habits among families with purchasing power.

Table2.4: Anaemia among children in India and Major States

India/ States	Key Indicator Children aged 6-35 months who are anaemic (%)	
	NFHS 3[a]	NFHS 2[b]
India	79.2	74.2
Assam	76.7	63.2
Bihar	87.6	81.1
Chhattisgarh	81.0	87.7
Jammu & Kashmir	68.1	71.1
Jharkhand	77.7	82.4
Kerala	55.7	43.9
Madhya Pradesh	82.6	71.3
Maharashtra	71.9	76.0
Orissa	74.2	72.3
Punjab	80.2	80.0
Rajasthan	79.6	82.3
Uttar Pradesh	85.1	73.8

Source: (a) NFHS 3 Fact Sheet (2005-06) (b) NFHS 2 (1998-99)

2.1 (vi) Immunization Status of Children and Vitamin A coverage

Immunization is one of the most cost effective interventions available for protecting children against infection, disease and death. However, the following Table 2.5 presents a bleak picture of the wide gap between the RCH Programme objectives of total immunization and actual achievement. Immunization coverage has increased by a mere 1 % between NFHS 2 and NFHS 3. Assam, Bihar, Jharkhand, Rajasthan and Uttar Pradesh have achieved substantial progress, but their coverage continues to be much lower than the national average.

The micronutrient status of India's children should also be a cause of alarm. Statistics from "India's Undernourished Children: A Call for Reform and Action, HNP Discussion Paper 2005" reveal that more than 75 percent of preschool children suffer from iron deficiency anaemia (IDA) and 57 percent of preschool children have sub-clinical Vitamin A deficiency (VAD). Iodine deficiency is endemic in 85 percent of India's districts. The impact of our Micronutrient Programmes has obviously not resulted in any substantial reduction of micronutrient deficiencies.

Table 2.5: Immunization Status and Vitamin A coverage of children in India and Major States

India/ States	Children 12-23 months fully immunized (BCG, Measles and 3 doses each of polio/ DPT) (%)		Children 12-23 months who have received BCG (%)		Children 12-23 months who have received 3 doses of polio vaccine (%)		Children 12-23 months who have received 3 doses of DPT vaccine (%)		Children 12-23 months who have received measles vaccine (%)		Children 12-35 months who have received Vitamin A dose in last 6 months (%)	
	NFHS 3[a]	NFHS2[b]	NFHS 3[a]	NFHS 2[b]	NFHS 3[a]	NFHS 2[a]	NFHS 3[a]	NFHS 2[b]	NFHS 3[a]	NFHS 2[b]	NFHS 3[a]	NFHS 2[b]
India	43.5	42.0	78.2	71.6	78.2	62.8	55.3	55.1	58.8	50.7	21.0	17.1
Assam	31.6	17.0	62.6	53.5	59.2	37.9	45.1	37.5	37.5	24.6	16.6	6.8
Bihar	32.8	11.6	64.7	36.0	82.4	42.2	46.1	24.9	40.4	16.2	29.4	6.8
Chhattisgarh	48.7	21.8	84.6	74.3	85.1	57.1	62.8	40.9	62.5	40.0	12.7	
Jammu & Kashmir	66.7	56.7	90.9	85.6	82.2	74.3	84.5	72.3	78.3	68.9	15.2	22.8
Jharkhand	34.5	8.8	72.9	44.3	79.6	36.4	40.3	21.6	48.0	18.2	23.3	
Kerala	75.3	79.7	96.3	96.2	83.1	88.4	84.0	88.0	82.1	84.6	38.2	28.2
Madhya Pradesh	40.3	22.6	80.5	62.0	75.6	56.6	49.8	35.8	61.4	34.1	16.1	14.7
Maharashtra	58.8	78.4	95.3	93.7	73.4	90.8	76.1	89.4	84.7	84.3	32.0	36.6
Rajasthan	26.5	17.3	68.5	53.9	65.2	44.6	38.7	26.1	42.7	27.1	13.2	12.5
Uttar Pradesh	22.9	20.2	61.0	56.5	87.5	41.3	30.0	32.7	37.5	33.5	7.3	9.5

Source: (a) NFHS 3 Fact Sheet (2005-06) (b) NFHS 2 (1998-99)

The HNP Discussion Paper, 2005 rightly states that "In India, child malnutrition is mostly the result of high levels of exposure to infection and inappropriate infant and young child feeding and caring practices, and has its origins almost entirely during the first two to three years of life. However, the commonly-held assumption is that food insecurity is the primary or even sole cause of malnutrition. Consequently, the existing response to malnutrition in India has been skewed towards food-based interventions and has placed little emphasis on schemes addressing the other determinants of malnutrition."

The paper goes on to state that misplaced association of addressing malnutrition with only food supplementation, without emphasizing the importance of nutrition and health education interventions, results in the programme targeting children mostly after the age of three when malnutrition has already set in. Other mismatches cited in the Paper are the comparative neglect of critical impact factors, such as, improving child-care behavior, educating parents regarding how to improve nutrition using the family food budget; mis-focused service delivery on children over 3 years of age, and exclusion of children from the lowest decibel of poverty, who are at higher risk of undernutrition; and the fact that the poorest states and those with the highest level of undernutrition still have the lowest levels of programme funding and coverage by ICDS activities.

2.2. Indicators for assessing Nutritional Status of Women

2.2 (i) Maternal Mortality Rate (MMR)

Maternal Mortality Rate is defined as the number of maternal deaths in women aged 15-49 years per 100,000 childbirths. A high maternal mortality rate would indicate, even in conditions of poverty and malnutrition, some or all of the following factors: lack of access to health care facilities and antenatal care, unsafe deliveries by untrained attendants, ignorance and lack of awareness regarding proper nutritional intake during pregnancy, absence of weight monitoring during pregnancy and lack of tetanus immunization. The socio-historical causes would be poverty, gender discrimination, poor nutritional status of the mother on account of being a malnourished adolescent, anaemia, early marriage and child birth and frequent pregnancies.

Table 2.6 presents MMR figures for India and some major States between the years 1998 and 2001-03.

Table 2.6: Maternal Mortality Ratio for India and Major States

India & Major States	MMR (1998) SRS[a]	MMR (2001-03) SRS[b]	NFHS1 (1992-93)[c]	NFHS 2 (1998-99)[d]
India	407	301	424	540
Assam	409	490		
Bihar/Jharkhand	452	371		
Madhya Pradesh/ Chhattisgarh	498	379		
Orissa	367	358		
Rajasthan	670	445		
Uttar Pradesh/Uttaranchal	707	517		
Andhra Pradesh	159	195		
Karnataka	195	228		
Kerala	198	110		
Tamil Nadu	79	134		
Gujarat	28	172		
Haryana	103	162		
Maharashtra	135	149		
Punjab	199	178		
West Bengal	266	194		

Source : (a) National Human Development Report (2001), Planning Commision, GOI (b) Sample Registration System, Maternal Mortality in India: 1997-2003 for 2001-03, Trends, Causes and Risk Factors, (c) NFHS 1 (1992-93), (d) NFHS 2 (1998-99)

NFHS 1 and NFHS 2 did not have State MMR figures

The difference between the SRS and the NFHS data could be the result of the different methodologies used by them. However, this paper does not go into the analysis or causes for the same.

Causes of Maternal Mortality in India

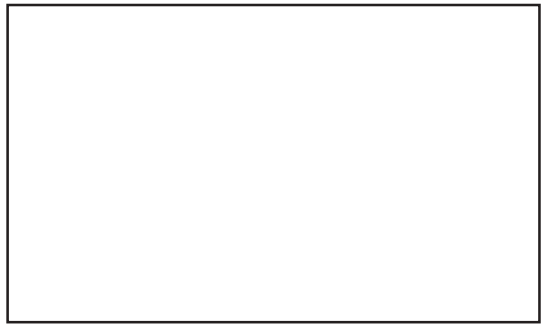


Figure 2.2: Causes of Maternal Mortality in India

Source: Sample Registration System, Maternal Mortality in India: 1997-2003 Trends, Causes and Risk Factors, Registrar General, India, New Delhi.

Figure 2.2 illustrates the major causes for maternal mortality in India. Haemmorrhage, sepsis, hypertension, obstructed labour, abortion adding up to 67% are directly related to anaemia, malnutrition, and poor access to institutional deliveries, or deliveries without trained birth attendants.

2.2 (ii) Access to Health Care Facilities by Women

Table 2.7: Access to Health Care Facilities by Women

Indicators	NFHS 3[a]	Urban[a]	Rural[a]	NFHS 2[b]
Mothers who consumed IFA for 90 days or more when they were pregnant with their last child (%)	22.3	34.5	18.1	
Births assisted by doctor/ nurse/LHV/ANM/ other health personnel (%)	48.3	75.2	39.1	42.4
Institutional Birth	40.7	69.4	31.1	33.6
Mothers who had at least 3 antenatal care visits for the last birth	50.7	73.8	42.8	44.2
Mothers who receive post natal care from doctor/ nurse/LHV/ANM/other health personnel within two days of delivery for their last birth (%)	36.4	60.7	28.1	

Source: (a) NFHS 3 (2005-06) (b) NFHS 2 (1998-99)

Low access to health care and vast programme coverage gaps are apparent in the Table 2.7, with the situation being much worse in rural areas.

As per NFHS 3, in 2005-06, barely half (51%) of mothers across the country had received at least three antenatal care visits during pregnancy and less than half (48%) of births were attended by a trained birth attendant which includes a doctor, nurse, lady health worker or ANM.

2.2 (iii) Chronic Energy Deficiency and Anaemia among women

Body Mass Index (BMI) is commonly used to assess Chronic Energy Deficiency (CED) among adults. It is calculated directly from the observed measurements of weight and height. The formula used for calculating BMI is $BMI = \frac{\text{Weight (kg)}}{\text{Height}^2(\text{m}^2)}$

The cut off points used for assessing chronic energy deficiency in adults are as follows:

BMI Class	Nutritional Status
Less than 16	III Degree CED
16-17.5	II Degree CED
17-18.5	I Degree CED
Greater than 18.5	Normal

Table 2.8 indicates that almost one third of the women in India have a Body Mass Index below normal, thereby indicating chronic energy deficiency. The improvement between NFHS 2 and 3 has been a marginal 3%. The incidence of anaemia among ever married women aged 15-49 years has risen from 51.8% in 1998-99 to 56.2% in 2005-06. The

Table 2.8: Malnutrition among Women in India and Major States

India/ States	Key Indicators					
	Women whose Body Mass Index is below normal (%)		Ever married women age 15-49 who are anaemic (%)		Pregnant women age 15-49 who are anaemic(%)	
	NFHS 3[a]	NFHS 2[b]	NFHS 3[a]	NFHS 2[b]	NFHS 3[a]	NFHS 2[b]
India	33.0	36.2	56.2	51.8	57.9	49.7
Assam	36.5	27.1	69.0	69.7	72.0	62.3
Bihar	43.0	39.1	68.3	60.4	60.2	46.4
Chhattisgarh	41.0	48.1	57.6	68.7	63.1	68.3
Jammu & Kashmir	21.3	26.4	53.1	58.7	54.0	56.3
Jharkhand	42.6	41.1	70.4	72.9	68.4	64.0
Kerala	12.5	18.7	32.3	22.7	33.1	20.3
Madhya Pradesh	40.1	35.2	57.6	49.3	57.9	49.9
Maharashtra	32.6	39.7	49.0	48.5	57.8	52.6
Orissa	40.5	48.0	62.8	63.0	68.1	60.5
Punjab	13.5	16.9	38.4	41.4	41.6	37.1
Rajasthan	33.6	36.1	53.1	48.5	61.2	51.4
Uttar Pradesh	34.1	36.5	50.8	49.0	51.6	45.8

Source: (a) NFHS 3 Fact Sheet (2005-06) (b) NFHS 2 (1998-99)

prevalence of anaemia among pregnant women aged 15-49 years has also increased from 49.7% to 57.9% during the same period. A woman's requirement for iron increases during pregnancy, as it is required for a) synthesis of additional volumes of blood b) synthesis of haemoglobin in the fetal blood cells c) the foetus accumulates a reserve in the liver to last about 6 months after birth since the baby's first food milk lacks iron. The data is indicative of the overall iron deficiency and poor health status among women and failure of programmatic interventions.

2.3. Indirect Indicators of Malnutrition

There are several indirect and subtly linked causes of malnutrition, such as lack of awareness and information, gender discrimination, female illiteracy, natural calamities, low income and low access to safe drinking water and hygienic sanitation. The most direct of these indirect causes are lack of hygienic sanitation and safe drinking water facilities.

Table 2.9 presents the data for households with access to toilet and safe drinking water facilities in India and major States.

In India only 44.6% and 87.9% of households have access to toilet facilities and safe drinking water respectively. Unhygienic sanitation and unsafe drinking water increase the

Table 2.9: Households with access to toilet facilities and safe drinking water

India/ States	Households with access to toilet facilities, NFHS 3 (2005-06) %	Households with access to safe drinking water, NFHS 3 (2005-06) %
India	44.6	87.9
Assam	76.4	72.4
Bihar	25.2	96.1
Chhattisgarh	18.7	77.9
Jammu & Kashmir	61.7	80.8
Jharkhand	22.6	57.0
Kerala	96.1	69.1
Madhya Pradesh	27.0	74.2
Maharashtra	52.9	92.7
Orissa	19.3	78.4
Punjab	70.8	99.5
Rajasthan	30.8	81.8
Uttar Pradesh	33.1	93.7

Source: NFHS 3 (2005-06)

incidence of infection, worm infestation and disease among adults and children and perpetuate malnutrition, draining away precious nutrient reserves of the human body, already in a condition of inadequate dietary intake. An undernourished child is more prone to infections. Infections increase the energy demand of the body, which when not fulfilled result in further malnutrition. This in turn further lowers immunity levels and increases the child's susceptibility to further infection. Lack of safe drinking water, poor personal and domestic hygiene continue to be major causes of intestinal diseases and infections and worsen the condition of malnutrition. Ignorance, lack of proper care and access to health facilities further aggravates the situation and results in a vicious combine of malnutrition and infection. A positive correlation between female education levels and better health and nutrition indicators for women and children is clearly brought out by NFHS 3. (*Annexure 1*)

The Malnutrition Trap

Dr. Werner Schutlink, Chief, Nutrition Section, UNICEF New York who served as Chief of the Nutrition Section, UNICEF, New Delhi between 2003 to 2007 is of the view that the high prevalence of infectious diseases play an important role in the persistence of malnutrition in India. The high population density and poor hygiene, especially in some States, sustain a high incidence and prolonged duration of diarrhoea. This in combination with a high prevalence of micronutrient deficiencies and unfavourable infant feeding practices constitute a vicious combine that acts as a malnutrition trap.

Making diarrhoea last for a shorter period, by informing and encouraging mothers to use ORS acts as an immediate measure to prevent deterioration in the malnutrition levels of children. There should be easy availability of ORS at the A.W. level and better information to the mothers regarding its immediate use in combination with explanation on adequate feeding.

Dr. Schutlink also believes that prioritization of malnutrition in the existing scenario of priority competition, especially at the district level and below, is an issue to be addressed during the implementation of the National Strategy to Combat Malnutrition, as also the question of proper supervision and motivation systems at the A.W., Panchayat and Block levels to monitor outcomes.

2.4 Nutritional Status of Men in India

2.4.i. Body Mass Index (BMI) and Anaemia among men and women in India and major States

Table 2.10 indicates that 28.1% of the men in India have Body Mass Index below normal. For the states of Assam, Chhattisgarh, Jharkhand, Madhya Pradesh, Orissa, Rajasthan and Uttar Pradesh, the percentage of men with BMI below normal is 33.4,

31.8, 33.4, 36.3, 32.1, 33.8 and 32.7 % respectively. Malnutrition sets in both sexes during early childhood due to the reasons stated in Sections 2.1 and 2.3. This results in stunted stature and low body weight of adult men, causing chronic energy deficiency.

Table 2.10 Body Mass Index (BMI) and Anaemia among men and women in India and major States

India/ State	Men with Body Mass Index below normal (%)	Women with Body Mass Index below normal (%)	Ever married men aged 15-49 who are anaemic (%)	Ever married women aged 15-49 who are anaemic (%)
India	28.1	33.0	24.3	56.2
Assam	33.4	36.5	44.6	69.0
Bihar	28.7	43.0	32.6	68.3
Chhattisgarh	31.8	41.0	26.4	57.6
Jammu and Kashmir	19.9	21.3	17.9	53.1
Jharkhand	33.4	42.6	37.4	70.4
Kerala	11.9	12.5	7.1	32.3
Madhya Pradesh	36.3	40.1	24.4	57.6
Maharashtra	24.9	32.6	16.2	49.0
Orissa	32.1	40.5	37.0	62.8
Punjab	12.0	13.5	12.6	38.4
Rajasthan	33.8	33.6	20.5	53.1
Uttar Pradesh	32.7	34.1	24.7	50.8

Source: NFHS 3 Fact Sheet (2005-06)

24.3% of the men in India are anaemic, thereby indicating lower energy levels, and working/earning capacity. The percentage of men suffering from anaemia ranges from 7.1% in Kerala to 44.6% in Assam. The causes for male anaemia are identical to those described in Sections 2.1 and 2.3. Female anaemia levels are higher than male on account of the additional iron burden placed on women through menstruation and child bearing.

3

International Comparisons

3.1 India's position in the Human Development Index for 2007 is 128 (China's rank is 81, Sri Lanka 99 and Bangladesh 140), reflecting a major deficiency in the quality of life of a vast majority of its population. It clearly reveals that despite our high rate of growth in the last decade averaging 5.9%, and more than 8% consecutively for a period of 3 years, the improvement in the nutritional situation of the population has been marginal as compared with countries like China, Sri Lanka and Bangladesh. Bangladesh has shown the most dramatic improvement in improving its mortality and nutritional indicators and has overtaken India. Regarding certain indicators such as Children Underweight and Children Under Height for Age, the situation in India is worse than that of Sub Saharan countries, such as, Ethiopia, Angola, Sudan and the Congo (DR).

Table 3.1: Development Indicators for India and other Countries

Country Name	Children under weight for age (%<5)		Children under height for age (%<5)		LBW(%)		IMR (per 1000 live births)		U5MR (Per 1000 live births)		MMR (per 100000 live births)	
	1996[a]	2007[b]	1996[a]	2007[b]	1996[a]	2007[b]	1996[a]	2007[b]	1996[a]	2007[b]	1996[a]	2007[b]
USA	-	2	-	3	8	8		6	-	7	17	11
Singapore	-	3	-	4	7	8	6	3	6	3	10	14
China	17	8	-	19	9	4	44	23	43	27	95	45
Brazil	7	6	-	-	11	8	57	31	61	33	220	110
Sri Lanka	38	29	-	18	25	22	17	12	19	14	140	58
Nigeria	36	29		43	16	14	84	100	191	194	1000	1100
Pakistan	40	38	-	42	25	19	89	79	137	99	340	320
Bangladesh	66	48	-	51	50	36	106	54	117	73	850	570
Sudan		41		48		31		62		90		450
Angola		31		51		12		154		260		1400
Congo (DR)		31		44		12		129		205		1100
Ethiopia		38		51		15		109		164		720
India	**53**	**47**	**-**	**51**	**33**	**30**	**81**	**56**	**119**	**74**	**570**	**450**

Source: (a) Human Development Report, UNDP 1996, (b) Human Development Report, UNDP 2007

4

Inter-generational Cycle of Malnutrition and Ill Health: Its consequences

4.0. Inter-generational Cycle of Malnutrition and Ill Health

4.1 Clearly, malnutrition is an extremely complex phenomenon with diverse and multiple causes. In addition to being multi-causal, the causes are also heterogenous, ranging from

Physical Causes: hunger, calorie/micronutrient deficit, low consumption of energy giving, protective foods rich in protein, iron, vitamins and minerals necessary for immunity, growth and good health, infection and disease;

Attitudinal: non feeding of colostrum, late introduction of complementary feeding, discrimination against the girl child, female illiteracy, early marriage and pregnancy, gender discrimination;

Socio-economic and historical: poverty and low income, ignorance and lack of awareness about proper dietary practices even within the existing purchasing power, about proper health and nutritional care of women and children, inter-generational malnutrition and anaemia;

Governance related: inadequate and poor health and child care service delivery systems, particularly ICDS and RCH, low immunization coverage, low percentage of institutional deliveries, deliveries without trained birth attendants, absence of antenatal care and lack of fortification of common foods consumed by the poor.

4.2 To add to its complexity, malnutrition in a person remains largely invisible. On account of lack of information and awareness, its visible manifestations, such as under weight or under height in children are not considered serious health concerns by the family or community, but merely accepted as natural physical traits. This has been confirmed by interviews with parents of underweight or stunted children and adolescents. Similarly, adults with chronic energy deficiency and anaemia attribute their lower energy levels and

morbidity to poverty and the hard physical labour. While poverty is indeed the root cause, families and communities lack information and awareness regarding the measures they must take even within the condition of poverty.

4.3 On account of the invisibility of malnutrition and the fact that it is not treated as a disease that can be directly or immediately fatal, "when a malnourishment-related death occurs, it is for various compounded reasons of prolonged nexus of low calorie diet and reduced resistance to disease and lack of health care. We may say that he did not die of hunger but died of disease." Swarna Sadasivam Vepa in "Is hunger real or imaginary?" *Economic Times, July 2007*

4.4 The fact that malnutrition is inter-generational and is passed on from one generation to the next is well acknowledged by experts and documented in several leading journals (Ending Malnutrition by 2020: An Agenda for Change in the Millennium, 2000, The Asian Enigma, 1996) and is accepted by nutritionists. Logically, therefore, it should follow that an inter-generational strategy alone promises greatest chances of success to eradicate malnutrition. However, it is precisely this factor that escapes attention while formulating strategies and programmes to eradicate it.

Figure 4.1: Inter-generational Cycle of Malnutrition and Ill Health

4.5 It is also obvious that no single intervention can eradicate malnutrition. The package of interventions must be widely inter-sectoral so as to address at least a majority of the causes listed in the foregoing paras; they must be simultaneous so that the benefit of one intervention is not lost on account of the absence of another; and they must cover the entire life cycle of women and children to create an immediate impact within one generation on the nutritional status of the three critical links of malnutrition, namely, children, adolescent girls, and women. Only then can the benefits be sustainable enough to break the inter-generational cycle, and be passed on to the next generation.

4.6 A new born with low birth weight (less than 2.5 kg) has a high risk of dying in early infancy. Even on survival, the child will be less likely to catch up on the lost growth and will be prone to a number of development deficits**.** Further, deprivation of colostrum which is a rich source of nutrients and contains the first administration of antibodies to an infant to develop immunity against different infections (only 23.4% of children under 3 years of age were breast fed within one hour of birth as per NFHS 3) increases the neonate's risk to catch infection. The infant's growth process receives a further setback if it is not exclusively breast fed for the first six months of life and if complementary feeding which should start at approximately 6 months of age is delayed, or is inadequate. (Only 55.8% of the children in India in the age group of 6-9 months receive semi-solid food and breast milk as per NFHS 3). On account of poverty and ignorance, introduction of complementary food is delayed and is also likely to be inappropriate and inadequate to meet the increasing nutritional requirements of the infant. Further, if it is not prepared hygienically in a clean environment, it makes the infant further prone to infections.

4.7 The problem is further aggravated in the case of a girl child as she is more likely to be meted inferior treatment vis a vis a boy child. By the time the girl grows up to be an adolescent she is much more likely to be malnourished, anaemic, with a below normal body mass index. She will probably be married before 18 years of age (44.5% and 50% of the women in the age groups of 20-24 are married before the age of 18 years as per NFHS 3 and 2 respectively), will bear children early and have quick pregnancies. Her weight gain during pregnancy will most likely be inadequate. (Presently, weight monitoring of pregnant women does not form part of any national programme.) As a result, the foetus of a malnourished and anaemic mother will suffer from Intrauterine Growth Retardation, and be born a low birth weight baby, perpetuating the inter-generational cycle of malnutrition.

4.8 The following Table summarizes the causes and consequences of malnutrition in infants and children, adolescent girls, women and pregnant and lactating mothers. In many cases the consequences also become causes, and *vice versa*.

Table 4.1: Causes and Consequences of Malnutrition for Infants, Adolescent Girls and Women

Life Stage	Direct Causes of malnutrition	Indirect Causes of Malnutrition	Consequences of Malnutrition
Infancy and Childhood	l Low Birth Weight l Discarding of Colostrum l Delayed initiation of breast feeding l Not exclusive breast feeding l Delayed introduction of Complementary Foods l Micronutrient Deficiency l Lack of immunization	l Poverty l Lack of information and awareness l Inadequate care of children l Unsafe water and lack of sanitation l Lack of personal and food hygiene l Worm infestations l Frequent infections and prolonged diarrhoea l Low immunity l Lack of access to health services	l High Infant and Child Mortality Rates l Low Birth Weight/ Underweight l Stunting and Wasting l Protein Energy Malnutrition l Anaemia l Diarrhoeal Deaths l Vitamin A Deficiency l Infections and Diseases l Repeated respiratory infections l Impaired physical and cognitive development l Reduced learning power
Adolescent Girls	l Low calorie intake/ consumption l Lack of consumption of protein and iron rich foods l Micronutrient Deficiency	l Poverty l Gender discrimination l Lack of information and awareness l Lack of education l Early marriage l Adolescent Pregnancy l Frequent child bearing l Frequent infections l Worm infestations l Unsafe water and lack of sanitation l Lack of personal and food hygiene l Lack of access to health services	l Under Weight l Stunted Growth l Lower Cognitive ability l Iron Deficiency Anaemia l Iodine Deficiency l Less physical strength and low productivity
Mothers and Women	l Low calorie intake/ consumption l Lack of consumption of protein and iron rich foods l Micronutrient Deficiency l Lack of Immunization	l Frequent child bearing l Lack of access to basic health services l Lack of information and awareness l Frequent infections l Worm infestations l Unsafe water and lack of sanitation l Lack of personal and food hygiene	l Low immunity l High Maternal Mortality Rates l Chronic energy deficiency l Anaemia l Low weight gain during pregnancy l Low Birth Weight Babies l Less physical strength and low productivity l Vicious cycle of poverty and malnutrition

5

What does malnutrition cost the nation?

5.1 The data presented in the foregoing Chapters points to a fairly certain conclusion that malnutrition is indeed invisibly wasting away a sizable portion of the physical and cognitive potential of our human resources, that are the strongest assets that any nation can have and eroding our human capital. It reduces physical/ cognitive growth and learning capability, lowers physical work output, resistance to infectious diseases and capacity to recover from illness, reduces resilience to shocks and causes low productivity and earning capacity in adults. Collectively, this negatively impacts economic development (GDP) with high mortality and morbidity rates adding to the health costs of the nation.

5.2 The following study calculates the economic cost caused to India, taking into consideration only the calorie deficit element of malnutrition, without taking into account the loss caused by anaemia, protein and other micronutrient deficiencies.

STUDY: GDP lost on account of Calorie Deficit

5.3 Calorie Intake by Indians: NNMB

5.3 (i) In order to monitor the nutritional status of the population and to assess the impact of the various programmes and policies of the Government, the National Nutrition Monitoring Bureau was set up by Indian Council of Medical Research in the year 1972.

5.3 (ii) Some of the salient scientific observations of the repeat surveys conducted by the NNMB in the years 1988-90 and 1996-97 are:

I. Food and Nutrient Intakes

- About 30% of households consume less than 70% of energy requirements. The diets of children under the age of 5 years are more inadequate than those of adults and are below the recommended dietary allowances.
- Inadequate consumption of protective foods like pulses, green leafy vegetables, milk and milk products.

- Dietary micronutrient deficiency, particularly Vitamin A and Iron. About 80% of the individuals consume diets which provide less than half of the RDA for these micronutrients.
- Intra family distribution of foods and nutrients reveals that pre school children get less than their physiological needs as compared to adult males and females.

II. Nutritional Status of Population

- About half the children are underweight and about 40% are stunted. The prevalence of underweight and stunting is considerably high even among adolescents.
- About half the adults and elderly suffer from chronic energy deficiency as measured by body mass index (<18.5)
- There is no gender bias with respect to nutritional status of females.
- About a quarter of the adolescent girls are married before the age of 18 years and among them about 25% are at risk of maternal problems due to their short stature (<145 cm)
- Nutritional status of the tribals is worse than their rural counterparts.

III. Time Trends

Repeat surveys in the same villages surveyed about 20-25 years back, indicate improvement in the intake of energy and proteins in all the age groups of individuals. The nutritional deficiency signs for PEM and Bitot Spot among rural pre-school children declined from 1.7% and 1.8% in 1975-76 to 0.2 and 0.7% respectively in 1996-97. The reduction in chronic energy deficiency in adult males and females declined from 55.6% and 51.8% to 45.5 and 44.8% for the same time period respectively.

5.4 Deficit Calorie Intake and its Cost to the Nation

5.4 (a) Computation of Energy Requirements

5.4(a) (i) The author has attempted a calculation regarding calorie consumption for households in India and its impact on the labour productivity, based on the findings of the NNMB Repeat surveys between the year 1988-90 and 1996-97, Fogel's NBER Working Paper No 16, "The Conquest of High Mortality and Hunger in Europe and America" 1990, and some general but realistic assumptions.

5.4(a) (ii) As Fogel correctly states in NBER Working Paper No 16, "The first law of Thermodynamics applies as strictly to the human engine as to mechanical engines. Since,

moreover, the overwhelming share of calories consumed among malnourished populations is required for BMR and essential maintenance, it is quite clear that in energy poor populations such as those of Europe during the second half of eighteenth century, the typical individual in the labour force had relatively small amounts of energy available for work."

5.4 (a) (iii) Energy requirements are best determined by measurements of energy expenditure. Energy expenditure from a physiological point of view is made up of three major components, viz., Basal Metabolic Rate, Survival Energy and Physical Energy.

1. Basal Metabolic Rate

Basal Metabolic Rate (BMR) is the principal component of the total energy requirement. It varies with age, sex and body weight. BMR may be defined as the amount of energy required to maintain the body at rest, sufficient to maintain body temperature and to sustain the functioning of heart, liver, brain and other vital organs (Fogel, 1990).

As per FAO/WHO/UNU Expert Consultation, Technical Series Report 724, 1985, the BMR can be easily calculated using the following equations for predicting BMR (Kcal/ 24 hours):

Sex	Age (yrs)	Equation
Male	18-30	15.3 X B.W. (kg) + 679
	30-60	11.6 X B.W. (kg) + 879
	>60	13.5 X B.W. (kg) + 587
Female	18-30	14.7 X B.W. (kg) + 496
	30-60	8.7 X B.W. (kg) + 829
	>60	10.5 X B.W. (kg) + 596

A Comparison of BMR computed from the FAO/WHO/UNU equation with actual measured BMR in a large number of well nourished Indians in a study (Basal Metabolic rate of South Indian Males, Food and Agricultural Organization, 1986 by Shetty P.S, Soares MJ and Sheela ML) has indicated that the actual measured BMR of Indians is 5% lower than that calculated/predicted by FAO/WHO/UNU equations. BMR of Indians can be computed using this equation and lowering the values by 5%. Climatic and environmental factors are responsible for this difference of about 5%.

The modified equations applicable to Indians as recommended by the Indian Council of Medical Research (ICMR) Committee (1988) are given below.

Sex	Age (yrs)	Equation
Male	18-30	14.5 X B.W. (kg) + 645
	30-60	10.9 X B.W. (kg) + 833
	>60	12.8 X B.W. (kg) + 463
Female	18-30	14.0 X B.W. (kg) + 471
	30-60	8.3 X B.W. (kg) + 788
	>60	10.0 X B.W. (kg) + 565

Basal Metabolic Rates calculated using these equations for Reference Indian man (60 kg) and woman (50 kg) as assessed by ICMR would work out to 1515 Kcal and 1171 Kcal per 24 hours respectively.

2. Survival Energy and Physical Activity

BMR is the energy required to meet the body at rest, excluding the energy required to eat and digest food, or for essential hygiene. Obviously, an individual cannot survive on the calories needed for basal metabolism alone. For calculating the Survival Energy which is termed as Regulatory Thermogenesis, namely, the obligatory and facultative components that include the metabolic response to food ingested i.e. the use of energy in digesting, absorbing, storing and disposing of ingested nutrients, as well as response of the body to stimuli such as cold, stimulants and drugs, the computation method adopted by FAO/ WHO/UNU Energy and Protein Requirements, Technical Series No 724 and Fogel 1990 is adopted. The energy required for these additional essential activities is estimated to be 1.27 BMR.

Taking this into consideration, it is clear that a diet consisting of calories to provide for survival energy and additional essential activities alone contains no allowance for the energy required to earn a living, prepare food or any other movements beyond those connected with eating and essential hygiene. It is not sufficient to maintain long term health but represents short term maintenance level of totally inactive dependent people (FAO/WHO/UNU 1985, Fogel, 1990).

Physical activity that is essential for daily life would include both the calorie cost of the durational quantum of the activity as well as the type of activity, whether Sedentary, Moderate and Heavy, as classified by ICMR.

The ICMR Committee has for the sake of practical computation categorized BMR as energy required for maintenance only, and has merged energy required for regulatory

thermogenesis with the energy cost of physical activity. Therefore, for our calculations we have adopted this computation.

5.4 (b) Findings of the NNMB Repeat Surveys in 1988-90 and 1996-97

5.4 (b) (i) On the basis of the findings of the NNMB Repeat Surveys in 1988-90 and 1996-97 that indicate that about 30% of the households consume less than 70% of energy requirements, the following calculations emerge.

5.4 (b) (ii) The Norm Level of Calorie Intake has been taken as 2700 Calories per consumer unit per day, by the National Sample Survey in Nutritional Intake in India, NSS 50th Round July 1993- June 1994. A person of a particular sex and age group is represented by an index (consumer unit number) according to the requirement of energy in terms of standard applicable to a "reference man." A male in the age group of 20-39 is considered as a standard known as reference man and his per day energy requirement is of a single consumer unit. The indices representing the energy requirement levels per diem of the different members of the household irrespective of age and sex are added together to derive the total number of consumer units in that household. Assuming an average family to consist of man, wife, one elderly member and three children below eighteen years of age, the total number of consumer units in a family based on the NSS Report can be calculated as approximately 5.

5.4 (c) Calorie deficit, Loss of Man Hours per person and total Productivity Loss for the Country

5.4 c (i) Based on findings of NNMB Repeat Surveys in 1988-90 and 1996-97 that indicate that about 30% of households consume less than 70% of energy requirement and norm level of calorie intake prescribed as 2700 Kcal in the NSS 50th Round, July 1993-June 1994 above, it would imply that the actual calorie intake for an average Indian consumer unit would be 1890 Kcal (calculating 70% of 2700 Kcal) leaving just about 375 Kcal for productive work (subtracting 1517 calories for BMR from 1890 calories calculated for reference man).

5.4 c (ii) As per Fogel, heavy work requires 219 Kcal per hour and moderate work requires 122 Kcal per hour. If one assumes a work year of 250 days, allowing for holidays, sickness, then the number of work hours available per day on energy of 375 Kcal left for productive activity works out to be less than 2.5 hours of heavy work and less than 4.4 hours of moderate work per working day.

This has been calculated on the formula:

$$\frac{E_a \text{ X Total Number of days in a year}}{E_r \text{ X Total Number of working days in a year}}$$

E_a: is the Energy Available for work = 375 Kcal

E_r: is the Energy Required for a particular work = 219 Kcal for heavy work and 122 Kcal for moderate work

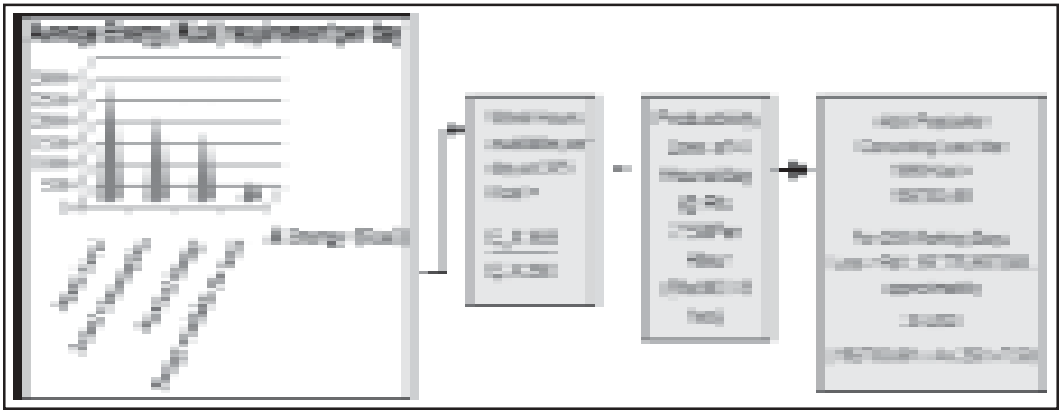


Figure 5.1: Productivity Losses due to Malnutrition

5.4 c (iii) As no data is available on the percentage of population employed in sedentary, moderate and heavy activities, we base our calculation on the assumption that a man is employed for 8 hours in moderately active occupation. This has been assumed on the basis of definition given by ICMR for Reference Indian man stating that he is employed for 8 hours in a moderately active occupation.

Based on the above it has been calculated that more than 4 hours of productive employment are lost each day per person due to inadequate calorie consumption (derived using the formula of Total Man hours available in a day for occupational activities minus Total Man Hours for which the work can actually be performed due to low productive capacity resulting from calorie deficit.)

5.4 c (iv) As per the Census of India 2001, there are 193,579,954 households in India. Based on the findings of the NNMB that 30% of the households consume less that 70% of the calorie requirement, it is calculated that 58,073,986 households consume less that 70% of the calorie requirement. Assuming that an average household has 5 Consumer Units, and adopting the Census data that an average family has 5 members, it may be calculated that the total number of people in the country who are consuming less than the

norm level for calorie intake is around 290,369,930. Approximately 55% of them are adults which amounts to 159,703,461.

5.4 c (v) Based on an actual average wage of Rs.60/- per man day of 8 hours, the per hour earning of the person works out to approximately Rs.7.50. Hence, the total money lost per day due to low productivity due to inadequate calorie consumption is approximately Rs.30/- per day per person.

5.4 c (vi) Total money lost by the entire adult population per day works out to be Rs.4, 791,103,830. Assuming a total of 250 working days, total money lost in a year would be Rs.1,197,775,957,500, approximately US $29,944,398,937 (conversion rate of 1 US $ = Rs.40/-) which is approximately 29 Billion US $. This amounts to 4% of GDP for year 2006-07 of Rs. 28481.57 billion, or US $712 billion.

5.4 c (vii) In the absence of reliable data this study does not take into account the productivity loss through protein and micronutrient malnutrition. Hence, the productivity loss projected above can only be interpreted as on the lower and not higher side.

5.4 (d) Assumptions

1. The calorie requirement norm is expressed in terms of Consumer Unit as defined by NSS according to the requirement of energy in terms of the standard applicable to a reference man. This averages out calorie requirements specific to age and sex.
2. The calculations for Productivity Loss have been worked out for an individual employed in a moderately active occupation as no data is available on the percentage of population employed in sedentary, moderate and heavy activities.
3. Since both the Census 2001 and NNMB Repeat Surveys have cited reliable data on the number of households and average membership of a household, the calculations for productivity loss for the entire nation are based on them.

5.5 Supporting Studies

5.5 (i) A study conducted by the Administrative Staff College of India, “National Strategy to Reduce Childhood Malnutrition” sponsored by the Asian Development Bank and UNICEF calculates the cost of malnutrition to India’s GDP as 3-9% in 1996 i.e. approximately $ 10-28 billion.

5.5 (ii) The methodology for calculating the economic costs of malnutrition to the nation has been explained in the report as follows:

5.5 (iii) Three parameters were taken into consideration to measure the productivity loss. These are:

1. Productive life expectancy
2. Average annual wage for an adult
3. Average rate of employment

5.5 (iv) The productive life expectancy denotes the life time productive period of an average individual. The estimates of annual wage of an adult and average rate of employment were made on the basis of GDP and census figures. Considering the fact that these parameters are dynamic and vary from State to State, three scenarios were built using different levels for each variable (Table 5.1). While the moderate scenario refers to national averages, the other two represent better and worse off situations.

Table 5.1: Assumptions used for cost analysis of malnutrition

Parameter	Unit	Scenarios		
		I Low	II Moderate	III High
Productive life expectancy	Years	15.6	20	25
Average annual wage for adult	Rs.	3500	5000	7500
Average rate of employment	%	75	80	85

5.5 (v) For each nutrition deficiency disorder, the productivity loss is expressed as percentage loss of the expected level. Highest productivity loss (50%) was assumed for cretinism and total blindness due to vitamin A deficiency.

Table 5.2: Productivity loss due to different deficiency disorders – Assumptions

Nutrient (%)	Deficiency disorder	Assumed Productivity loss
Calories	Chronic Energy Deficiency	10
Iron	Anaemia	20
Iodine	Mild iodine deficiency	5
	Cretinism	50
Vitamin A	Partial blindness	25
	Total blindness	50

5.5 (vi) To calculate the cost-benefit ratios, annual productivity loss was estimated separately for each nutritional deficiency disorder. Estimation of annual productivity loss allowed direct comparison with the annual costs of interventions to arrive at cost-benefit ratios. For each deficiency disorder, "annual productivity loss" due to disability during the current year as well as cumulative productivity loss due to pre-mature mortality were taken into consideration.

Annual productivity loss is calculated as:

Annual productivity loss = *(nxpxwxe) – (dxpexwxe)*

Where

n : number of adults suffering from deficiency disorder

p : productivity loss due to disorder

w : annual wage

e : employment rate

d : deaths due to disorder

pe: productivity life expectancy

5.5 (vii) This approach permits direct comparison of annual recurrent losses due to different nutrition deficiencies with the cost of interventions. The results are presented below:

Table 5.3 : Estimated annual productivity losses due to Nutritional deficiencies

Nutritional deficiency	Scenario I		Scenario II		Scenario III	
	Rs. Billion	US$ Billion	Rs. Billion	US $ Billion	Rs. Billion	US $ Billion
Protein Energy Malnutrition	160.6	4.6	284.6	8.1	525.8	15
Vitamin A deficiency	7.7	0.2	15	0.4	29.9	0.9
Iodine deficiency disorders	32.5	0.9	50.8	1.5	73.7	2.1
Iron deficiency	143.7	4.1	220	6.3	352.4	10.1
Total	344.5	9.8	570.5	16.3	981.8	28.1

5.5 (viii) As shown in Table 5.3 above, the estimated annual productivity loss due to major nutrition disorders in India ranged between 10-28 billion US Dollars during the year 1996.

This accounts for 3-9% of Gross Domestic Product, highlighting that nutritional disorders contribute a significant productivity loss which India can ill-afford. Between the four nutritional deficiencies, PEM and Iron Deficiency Anaemia contributed to nearly 90% of the total loss. The extent of prevalence of the nutritional deficiencies has been determined from NFHS 2 and NNMB data.

5.5 (ix) The findings of this study are further corroborated by studies conducted by CARE India and Linkages India, 2003 which confirm a GDP loss in the absence of appropriate interventions of US $ 114 billion between 2003 and 2012 owing to productivity losses due to PEM, IDD and IDA (CARE India and Linkages India 2003).

A more recent study examining only the productivity losses associated with foregone wage employment resulting from child malnutrition, estimates the loss to be US $ 2.3 billion or Rs 103 billion (Bhandari and Zaidi 2004).

Other studies suggest that micronutrient deficiencies alone may cost India US $ 2.5 billion annually (Alderman 2005) and that the productivity losses (manual work only) from stunting, iodine deficiency and iron deficiency together are responsible for a total productivity loss of 3% of GDP (Horton 1999).

Table 5.4: Productivity Losses due to malnutrition in India

	(i) DALYs lost due to malnutrition in India	(ii) Estimated total annual losses due to malnutrition ($billions)	(iii) Estimated loss of adult productivity, as % GDP
Protein-energy malnutrition (stunting)	2,939,000	8.1	1.4
Vitamin A deficiency	404,000	0.4	
Iodine Deficiency Disorder	214,000	1.5	0.3
Iron Deficiency	3,672,000	6.3	1.25

Source: (i) World Bank 2004, (ii) & (iii) Horton 1999, India's Undernourished Children: A Call for Reform and Action, HNP Discussion Paper, 2005

5.5 (x) The studies draw a uniform conclusion with a high degree of certainty that approximately 3% of GDP is lost on account of malnutrition and its various manifestations.

6

State Responses: Malnutrition in the Five Year Plans

6.1 The **First Five Year Plan (1951-56)** addressed the more visible manifestation of malnutrition. It focused on the removal of severe clinical manifestations of malnutrition and micronutrient deficiencies, such as nutritional blindness, beri beri, pellagra, marasmus and kwashiorkor. The **Second Five Year Plan (1956-61)** while primarily addressing food production and food security, entrusted the calculation of nutrition data to the ICMR. Food technology for improving nutritive value of foods and production of fruits and vegetables was also emphasized. Nutrition formed a separate section under the chapter on Health with priority for improving nutrition of vulnerable groups such as expectant and nursing mothers, infants, pre-school and school going children as its specific objective. The Indian Council of Medical Research was entrusted with research and data collection on the nutritional status of these groups.

6.2 After making significant progress in food production during the first two Five-Year Plans, the **Third Five Year Plan (1961-66)** focused on improving the nutrition of the people through dietary diversification. The Mobile Food and Nutrition Extension Service and Applied Nutrition Programme for improving consumption by promoting production of fruits and vegetables, milk and fish etc, at household and community levels were important nutrition interventions of the Third Five Year Plan. **Creating nutritional awareness and changing food habits of the people were important objectives of the strategies recommended in the Plan.**

6.2 (i) However, it is unfortunate that this strategy, though recommended as early as in the Third Five Year Plan missed out in implementation, and remains applicable even today.

6.3 The **Fourth Five Year Plan (1969-74)** recognised the problem of malnutrition among the vulnerable groups and directed specific nutrition programmes for addressing the problem of protein energy malnutrition in children, nutritional anaemia among pregnant women and blindness due to Vitamin A deficiency in children. The Crash Feeding Programme for pre-school children in rural, urban and tribal areas, the Balwadi Nutrition

Programme for bridging the calorie and protein gap, the National Prophylaxis Programmes for Nutritional Anaemia and Nutritional Blindness due to Vitamin A deficiency, were launched in the Social Welfare and Health sectors of the Government.

6.4 The **Fifth Five Year Plan (1974-79)** emphasized the need for an integrated approach for combating malnutrition in children and women at the national level. The Integrated Child Development Services (ICDS) Scheme originated during this Plan period. The Minimum Needs Programme (MNP) with 8 basic minimum services was considered as the core of the social sector development plan. These were Elementary Education, Rural Health, Rural Water Supply, Rural Electrification, Rural Roads, Rural Housing, Environmental Improvement of Urban Slums and Nutrition. It may be noted, however, that all components of the MNP subsequently became national programmes, except the subject of Nutrition, which got subsumed in ICDS, and never became a programme by itself.

6.5 'Nutrition' was included as a separate chapter from the **Sixth Five Year Plan (1980-85)** onwards. However, the concept of nutrition continued to be viewed as synonymous with the supplementary feeding component of the two national programmes, viz., the nutrition component of the ICDS for children from 0-6 years and pregnant and nursing mothers, and the Mid Day Meal Programme of the Department of Education.

6.6 A Task Force on Nutrition Policies and Programmes was set up by the Planning Commission in 1980 to work on inclusion of a nutrition component in sectoral policies and programmes. The Task Force realized the need for a Nutrition Policy for the country, and the Department of Women and Child Development constituted an Expert Working Group in 1990 for formulating a Policy.

6.7 The **Seventh Five Year Plan (1985-90)** continued to lay emphasis on the strategies of the Sixth Plan. The ICDS was expanded and nutrition programmes for 0-6 year old children, pregnant and nursing mothers, particularly belonging to drought prone, remote tribal areas, landless agricultural labourers, and urban slums were continued. Nutrition Education and Extension, Development and Production of Nutritious Foods like Miltone, Ready-to-Eat Extruded foods/Energy foods, fortification of toned milk with vitamin A were emphasised. Nutrition surveys, research and evaluation were also given priority. Recognising the important role of some sectors indirectly related to Nutrition, such as, Health and Family Welfare, Agriculture, Food and Public Distribution, Education, Rural Development, Information & Broadcasting, strong inter-sectoral coordination towards improving Nutrition was recommended. Emphasis was also placed upon employment generation, equitable distribution of food through expansion of the Public Distribution System, provision of safe drinking water, immunization on a wider scale and expansion of the health care system.

6.8 The **Eighth Five Year Plan (1992-97)** continued the programmes of the Seventh Plan. The National Nutrition Policy was adopted by the Government under the aegis of Department of Women and Child Development in 1993 and laid in both the Houses of Parliament. The International Conference on Nutrition (ICN) jointly organised by the Food and Agriculture Organisation and World Health Organisation in December 1992 at Rome also directed all member countries to adopt a National Nutrition Policy and develop a National Plan of Action on Nutrition. The National Nutrition Council was set up in the Planning Commission in 1994 under the Chairmanship of Hon'ble Prime Minister. (However, it has not met so far.)

6.9 The **Ninth Five Year Plan (1997-02)** continued most of the programmes of the Eighth Plan with the following objectives:

i) Freedom from hunger.
ii) Reduction in under-nutrition.
iii) Prevention, early detection and effective management of micronutrient deficiencies and the associated health hazards.

Improvement in dietary intake and nutritional status of the family was also emphasised, as also the effective implementation of the National Nutrition Policy.

However, no new programmes, or revamping of existing programmes took place to achieve these objectives.

6.10 The **Tenth Five Year Plan (2002-07)** focused on comprehensive interventions aimed at improving the nutritional and health status of individuals with a paradigm shift from:

- Household food security and freedom from hunger to nutrition security for the family and the individual
- Untargeted food supplementation to screening of persons from vulnerable groups, identification of those with various grades of under nutrition and appropriate management
- Lack of focused interventions on the prevention of over nutrition to the promotion of appropriate lifestyles and dietary intakes for the prevention and management of over nutrition and diabetes.

The Plan stated that interventions would be initiated to achieve

i. Adequate availability of food stuffs
ii. Prevention of under nutrition through nutrition education
iii. Operationalizing universal screening of pregnant women, infants, preschool and school children for under nutrition

iv. Operationalization of nutrition interventions for the management of under nutrition.
v. Prevention, early detection and appropriate management of micronutrient deficiencies and associated health hazards
vi. Promotion of appropriate dietary intake and lifestyles
vii. Nutrition monitoring and surveillance

Unfortunately, none of the objectives of the 10th Plan were followed by any substantive Programmes or Schemes to achieve them.

6.11 The **Approach Paper to the 11th Plan** acknowledges the fact that though declining, the magnitude of the problem of malnutrition continues to be very high. However, neither the inter-generational character, nor the economic dimension of malnutrition have been taken cognizance of. The Approach Paper repeats the objective of Universalizing ICDS, (an objective also of the 10th Plan) and tends to persist with the usual premise that ICDS is the tool for eradication of malnutrition, without going into any critical analysis and assessment. The usual causes and determinants of malnutrition are cited in the relevant sectoral chapters. But Malnutrition or Strategies to address it do not appear in a holistic, consolidated form under a single head or subhead. Hence, the highly inter-sectoral subject remains scattered as before, without being integrated into a holistic programmatic framework.

6.12 The monitorable Targets of the Approach Paper to the 11th Plan relating to Malnutrition remain roughly the same as the unachieved monitorable targets of the 10th Plan:

- Reduce IMR to 28 and MMR to 1 per 1000 live births
- Provide Clean Drinking Water for all by 2009 and ensure that there are no slip backs by the end of 11th Plan
- Reduce malnutrition among children of age group 0-3 years to half its present level
- Reduce anaemia among women and girls by 50% by the end of 11th Plan.

6.13 A critical assessment of the manner in which the subject of Nutrition has been treated in the 5 Year Plans would lead one to believe that the Planners were on the right track until the 5th Five Year Plan. The ICDS was indeed a step in the right direction for Early Childhood Development, constituting an element of supplementary nutrition for children from 0-6 years and pregnant and lactating mothers. That the interventions were inadequate, that the supplementary feeding became a substitute feeding, as several studies have confirmed, that the ICDS has still not been universalized, that the States constantly reneged on allocating funds for the supplementary nutrition programmes, are facts

extensively documented. However, it must be noted that the ICDS was not intended to be a programme for the eradication of malnutrition in the country. It did not have a component of disseminating nutritional awareness to the general population, it did not address the adolescent girl's nutritional status, that is the critical link to ensuring the nutritional and health status of the next generation, and it did not cover micronutrient deficiencies or the indirect causes for malnutrition as discussed in Para 2.3. Unfortunately, it appears that somehow after the ICDS became a major national programme, the issue of malnutrition became embedded into it and created a belief in the minds of the planners, policy makers and programme managers that no further measures were necessary to address it.

6.14 This could perhaps be the reason as to why Plans subsequent to the 5th Five Year Plan have continued with the notion that all the essential components of addressing malnutrition in the country are contained in the ICDS and have not thought beyond them. Even the Public Interest Litigation known as People's Union for Civil Liberties (PUCL) vs. Union of India and Others, Writ Petition (Civil) 196 of 2001, presently being heard in the Supreme Court reinforces this belief, and the Government instead of using this as an opportunity to rethink its strategies and work on a National Programme to eradicate malnutrition, continues to respond as if eradicating malnutrition is really the mandate of the ICDS. Until this distinction is understood by the key decision makers in the policy domain, the floundering will continue.

6.15 Malnutrition is also a misunderstood word amongst our Planners. It is considered synonymous with feeding and with hunger and food security. It's vast inter-sectoral dimensions, inter-generational character, its relationship with poverty and income generation, its economic losses to the nation, have yet not registered in the processes of economic planning. Malnutrition is still not stated as a major national challenge by the political leadership, either at the National or State levels, and even when it is, it is never prioritized high enough to be followed up by a meaningful or effective strategy to combat it with requisite programme back up or resource allocation.

6.16 The author believes that the 5th Five Year Plan was the defining moment when Nutrition missed out on the opportunity of becoming a stand alone National Programme, when all other MNP issues became so, and became instead a mere appendage to the ICDS. One can only assume that neither the lobby of professional nutritionists, nor the development administrators were able to impress the highest political leadership or the planners and policy makers of its long term or short term consequences on national development.

6.17 It is also unfortunate that the 3rd Five Year Plan prescription regarding the importance of creating nutritional awareness and changing food habits of the people was completely

ignored and subsequently forgotten by the Government. Even today there is no programme for this extremely important and essential strategy. The fact that the percentage of population suffering from malnutrition far exceeds the percentage of people below the poverty line clearly establishes that malnutrition is not merely confined to the BPL families, but extends well into families with purchasing power, on account of ignorance and superstition. Hence, it is clear that the crucial element of providing nutrition awareness and information to the general public did not take off and is still lacking, with no signs yet of any governmental moves to initiate it.

6.18 It is also not understood as to why in the face of such alarming data, there have been no new strategies or ideas since the 5th Five Year Plan, to address this invisible, silent emergency that is facing the country. Subsequent Plans reiterate the ICDS as the vehicle to redeem the Plan objectives regarding eradication of malnutrition, with very few ideas regarding how to achieve them. Agreed, the issue is so inter-sectoral that no single Ministry or agency can be held responsible to achieve them. But all the more it would require serious, concerted thinking at the highest political and administrative levels to frame a strategy, and a strong coordination mechanism for determining targets and ensuring their timely achievement. Sadly, this has not yet happened.

7

Policy Instruments

The National Nutrition Policy 1993

7.1 The National Nutrition Policy 1993 drafted by the Department of Women and Child Development, Government of India, advocated a comprehensive, integrated and inter-sectoral strategy for addressing the multifaceted challenge of malnutrition. The strategy highlights the importance of direct nutrition interventions for vulnerable groups as short term measures, as well as various development policy instruments as long term institutional and structural changes to bring about improved nutritional standards in the country.

7.2 The Direct Interventions – Short Term prescribed by the National Nutrition Policy are:

(i) **Nutrition intervention for especially vulnerable groups**, by expanding the safety net for children, triggering appropriate behavioral changes among mothers, reaching the adolescent girls, and ensuring better coverage of expectant women so as to prevent low birth weight.

Reaching the Adolescent Girls through the ICDS, was specifically prescribed so as to improve their nutritional status and prepare them for safe motherhood. The Policy mandates that all adolescent girls from poor families should be covered through the ICDS by 2000 in all Community Development (CD) Blocks of the country and 50% of urban slums.

Ensuring better coverage of expectant women so as to achieve a target of 10% low birth weight babies by the year 2000 was also recommended, to be achieved through providing supplementary nutrition beginning from the first trimester and continuing through lactation until one year after pregnancy.

(ii) **Fortification of Essential Foods with appropriate nutrients**, such as, salt with iodine and/or iron, and intensification of research in iron fortification of rice and other cereals.

(iii) **Popularization of Low Cost Nutritious Food** from indigenous and locally available raw materials with the involvement of women.

(iv) Control of Micronutrient Deficiencies amongst Vulnerable Groups, such as Vitamin A, iron and folic acid, and iodine, through intensification and complete coverage of the existing National Prophylaxis Programme for the prevention of Blindness due to Vitamin A Deficiency and National Nutritional Anaemia Programme.

7.3 In addition to the Direct Interventions, the National Nutrition Policy also prescribed the following Indirect Policy Instruments and long term Institutional and Structural Changes relating to (a) Food Security, (b) Improvement of Dietary Pattern through Production and Demonstration, (c) Poverty Alleviation Programmes and Strengthening of the Public Distribution system, (d) Land Reforms, (e) Nutrition Surveillance (f) Monitoring of Nutrition Programmes (g) Research (h) Equal Remuneration (i) Communication (j) Minimum Wage Administration (k) Community Participation (l) Education and Literacy (m) Improved status of Women, and Prevention of Food Adulteration.

7.4 The implementation of the National Nutrition Policy was to be done by an Inter-Ministerial Coordination Committee under the Chairmanship of Secretary, Department of Women and Child Development, and a National Nutrition Council would be constituted in the Planning Commission with Prime Minister as Chairman to oversee the implementation of the Policy.

7.5 The National Nutrition Council was set up in 1994 under the Chairmanship of Hon'ble Prime Minister. However it has not met so far.

7.6 The Inter-Ministerial Coordination Committee turned out to be a weak body and proved itself to be completely non-functional.

7.7 The National Nutrition Policy was followed by a National Plan of Action in 1995 based on the recommendations of the National Nutrition Policy. It also set quantitative goals to be reached by the year 2000 as follows:

- reduction in moderate and severe malnutrition among pre-school children by half
- reduction in chronic under nutrition and stunted growth in children
- reduction in incidence of low birth weight to less than 10 per cent
- elimination of blindness due to vitamin A deficiency
- reduction in iron deficiency anaemia among pregnant women to 25%
- universal iodization of salt for reduction of iodine deficiency disorders to 10%
- giving due emphasis to Geriatric Nutrition
- production of 250 million tones of food grains
- improving household food security through poverty alleviation programmes
- promoting appropriate diets and healthy lifestyles

7.8 Sectoral plans for all Ministries related to Nutrition such as Agriculture, Public Distribution, Education, Forestry, Maternal and Child Health, Food Processing, Information and Broadcasting, Labour, Rural Development, Urban Development, Women and Child development were drawn up with time bound strategies to achieve these goals.

7.9 However, these were not accompanied by additional resource allocation, or serious monitoring, and remained largely on paper. Sectoral Plans that were outside the regular programmes of the Department of Women and Child Development did not take off. The monitoring power of the Department of Women and Child Development was weak and the oversight and monitoring that should have come from the highest level viz., National Nutrition Council headed by the Hon'ble Prime Minister never came.

7.10 Hence, the National Nutrition Policy, though a most comprehensive and realistic document failed to get implemented, and the National Plan of Action failed to take off on account of the reasons stated above. An opportunity to highlight Malnutrition as a priority and gap area in the national development agenda was missed. The basic policy tenets and operational strategies of the National Nutrition Policy 1993 and the National Plan of Action 1995 were completely ignored, and their criticality failed to catch the attention of policy makers, development administrators and experts.

7.11 The position continues unchanged even today: malnutrition is still not viewed as a serious national problem; the subject of Nutrition, being so inter-sectoral, does not come exclusively under the domain of a single Ministry or Department, nor is it seen as an explicit goal by various concerned sectors; nutrition is still considered synonymous with the public distribution system, hunger, food security, ICDS and the midday meal programme; the objectives and prescriptions of the National Nutrition Policy have not been translated into specific programmes or schemes, and State level actions on implementation of the Nutrition Policy instruments do not receive the required priority and resource allocations.

8

Present Direct and Indirect Intervention Programmes

Table 8.1: Present Direct and Indirect Intervention Programmes

8.1 Name of Scheme/ Implementing Agency:

Integrated Child Development Services (ICDS)/ Ministry of Women and Child Development[1,6]

Components:

- Supplementary Nutrition
- Non Formal Pre School Education
- Immunization
- Health Check up/ Referral Services
- Nutrition and Health Education

Coverage/ Impact:

Projects:

The ICDS was introduced in 33 blocks (projects) in 1975. It was expanded to 6277 projects as on 14.12.06, of which 5724 projects with 7.81 lakh AWCs have became operational as on 30.09.06.

As per NFHS 3, the coverage of ICDS has steadily increased since its inception in 1975. According to a recent report by Citizen's Initiative for Rights of Children under Six, 2006, the programme is operational in almost every block, and the country currently has more than 700,000 *anganwadi*s. Nonetheless, the above Report suggests that the effective coverage of ICDS remains quite limited. As per NFHS 3, only 26.3% of all children under six received supplementary nutrition , only 20% of the children under six years of age received immunization, 15.8% received health check ups and 18.2% of the children were weighed. Only 48.9% of the mothers received counseling from an AWC after the child was weighed.

Indicators for utilization of services by mothers are more depressing. Only 20.5% of

the pregnant women received supplementary food from the AWC, 12.3% received health check ups and 10.9% nutrition and health education. In case of lactating mothers, only 16.5% received supplementary nutrition, 8.5% received health check ups and 8.3% of the lactating mothers were given nutrition and health education.

Beneficiaries: As on 30.09.06, services under the scheme are being provided to about 654.65 lakh beneficiaries, comprising of about 543.43 lakh children (0-6 years) and about 111.22 lakh pregnant and lactating mothers through a network of about 9.46 lakh Anganwadi Centres

NIPCCD conducted an evaluation of 150 projects spread over 35 States/ Union Territories. The sample comprised of 4 % of the total universe.

The following are the findings of the study:

- The percentage of children with low birth weight reduced from 41% in 1992 to 29% in 2006.
- The percentage of severely malnourished children in the age group 0-3 years reduced from 7% in 1992 to 1% in 2006 and in case of children in the age group 3-5 years it reduced from 4% in 1992 to 0.8% in 2006

Financial Norms:The financial norms for supplementary nutrition under ICDS Scheme, fixed in 1991, have been revised in October 2004. For children (6 months to 72 months) the rates have been revised from 95 paise per child/ per day to Rs.2.00 per child/ per day. For severely malnourished children (6 months to 72 months) the financial norms have been revised from 135 paise per child/ per day to Rs.2.70 per child/ per day. For pregnant and nursing mothers (as per Kishori Shakti Yojana/ Adolescent Girls) the revision is from 115 paise per beneficiary per day to Rs.2.30 per beneficiary per day.

8.2 Name of Scheme/ Implementing Agency:

National Programme of National Support to Primary Education (Mid Day Meal Programme)/ Ministry of Human Resource Development[2,6]

Components:

- Universalization of Primary Education
- Providing Nutritional Support to the Children
- School Health Programme

Coverage/ Impact:

- Launched as a Centrally Sponsored Scheme on 15th August 1995, initially in 2408 blocks in the country. By the year 1997-98 the NP-NSPE was introduced in all Blocks of the country. It was further extended in 2002 to cover not only children in classes I-V of government, government aided and local body schools, but also children studying in centres run under the Education Guarantee Scheme (EGS) and Alternative and Innovative Education (AIE) Scheme.

- The Mid Day Meal Programme has extended its coverage to 809521 Primary Schools and 143177 EGS/AIE Centres
- During 2004-05, about 10.88 crore children were being covered under the programme
- As on December 2004, progress of implementation of cooked Mid Day Meal Program was as follows:

  Full Implementation - 20 States and all 7 UTs

  Partial Implementation - 8 States (Assam, Bihar, Goa, J&K, Punjab, Jharkhand, Uttar Pradesh and West Bengal)

Revised Scheme and Financial Norms:

- As per the revised norms the cooked meal should contain 450 calories and 12 gm protein instead of earlier norm of 300 calories and 8-12 gm protein.

8.3 Name of Scheme/ Implementing Agency:

Kishori Shakti Yojana/ Ministry of Women and Child Development[3,6]

Components:

- Girl to Girl Approach
- Balika Mandal
- Non formal Education
- Training and Capacity Building of the Adolescent girls in home based and vocational skills
- Nutrition and Health Education
- Productive Employment

The scheme is implemented using the infrastructure of ICDS. The Scheme targets adolescent girls in the age group of 11-18 years, for addressing their needs of self development, nutrition and health status, literacy and numerical skills, vocational skills.

Coverage/ Impact:

The scheme has expanded from 2000 blocks in the year 2000 to 6118 Blocks in the year 2005-06. Grant in aid @ of Rs.1.10 lakh only per block per annum is released to the States/UTs for the implementation of KSY. In the year 2006-07, a sum of Rs.31.25 crores as first installment has been released under KSY.

8.4 Name of Scheme/ Implementing Agency:

Vitamin A Supplementation Programme/Ministry of Health and Family Welfare[4,6]

Components:

Infancy

- Nutrition and Health Education emphasizing on colostrum feeding, exclusive breast feeding, timely introduction of complementary foods

- Administering 1,00,000 IU dose of Vitamin A at 9 months

Childhood

- Health education efforts to ensure adequate intake of Vitamin A rich food throughout childhood
- Early detection and prompt treatment of infections. Vitamin A dose of 1,00,000 IU at 9 months and 2,00,000 I.U thereafter at six monthly intervals up to five years of age

Sick Children

- All children with xerophthalmia to be treated at health facilities
- All children suffering from measles to be given one dose of Vitamin A if they have not received it in the previous one month
- All cases of severe malnutrition to be given one additional dose of Vitamin A

Coverage/ Impact:

The programme is in operation in India since 1970 and covers children in the age group of 6 months to 3 years. Under the massive dose programme, every child in the above mentioned age group is to be administered Vitamin A every 6 months. As per NFHS 3 data released recently, only 25.1% of the children aged 12-35 months have received a Vitamin A Dose in the last 6 months. This figure drops further, to only 18 percent, among children age 6-59 months.

8.5 Name of Scheme/ Implementing Agency:

National Nutritional Anaemia Control Program/ Ministry of Health and Family Welfare[4,6]

Components:

- Promotion of regular consumption of foods rich in iron
- Promoting consumption of iron and folic acid supplements for 100 days for the high risk groups i.e. pregnant women (each tablet containing 60mg/100mg of elemental iron and 500 micro gm folic acid per day), pre school children (each tablet containing 20mg iron and 100 micro gm folic acid per day), lactating women and IUD acceptors (each tablet containing 60mg/100mg of elemental iron and 500 micro gm folic acid per day)
- Identification and treatment of severely anaemic cases

Coverage/ Impact:

The programme aims to cover women in the reproductive age group, particularly pregnant and lactating mothers, children 1-5 years of age and women who accept family planning measures like intrauterine devices (IUD) and tubectomy.

Only 5% children aged 6-59 months were given an iron supplement in the seven days before the survey under NFHS 3 was conducted and 12 percent children aged 6-59

months had received deworming medication in the six months preceding the survey.

Only 22.3% of the women consumed IFA for 90 days or more when they were pregnant with their last child.

8.6 Name of Scheme/ Implementing Agency:

National Iodine Deficiency Disorders Control Program/ Ministry of Health and Family Welfare[5,6]

Components:

- Survey to assess the magnitude of Iodine Deficiency Disorder
- Supply of iodized salt
- Re-survey to assess the impact of supply of iodized salt after every 5 years
- Monitoring the quality of iodized salt
- Health Education and Publicity

Just under half (47.5%) of children aged 6-59 months live in households using adequately iodized salt. The percentage is much higher in urban areas (68 percent) than in rural areas (40 percent).

NFHS 3 made an attempt to understand the extent of iodization of salt at the household level by testing the salt from the households in laboratories. Among the households that had their salt tested, just over half (51%) were using salt that was adequately iodized which is virtually the same as NFHS 2 (50%). One quarter of households were using salt that was inadequately iodized and the remaining one quarter were using salt that was not iodized at all. A comparision of this with the NFHS 3 data of 51% shows hardly any progress.

The rural population and people of low socio economic status continue to have poor access to adequately iodized salt. Also noteworthy is the fact that salt that is predominantly transported by rail has better levels of iodization as compared to salt transported by road.

Source:

1. National Institute of Public Cooperation and Child Development (2006): Three Decades of ICDS-An Appraisal, New Delhi
   http://wcd.nic.in/icds.htm
2. http://www.education.nic.in/mdm/mdm.asp
   http://education.nic.in/Annualreport2004-05/EEduLit.pdf
3. wcd.nic.in/KSY/ksyintro.htm
4. http://mohfw.nic.in/annualrep%20english/chap5.pdf
5. Pandav, C.S, Anna Somos-Krishnan, Chakrabarty A., Karmarkar M.G.: Universal Salt Iodization (USI): The Development Paradox of India. Quest towards Sustainable and Permanent Solutions of Eliminating Iodine Deficiency Disorders (IDD) through ownership transfer.
6. NFHS 3

9

CAPART's Strategy towards Combating Malnutrition using the Life Cycle Approach

9.1 The Council for Advancement of People's Action and Rural Technology (CAPART) is an autonomous organization under the Ministry of Rural Development. CAPART, was established in 1986 with a mandate to encourage, promote and assist voluntary action and inject new technological inputs in the implementation of rural development projects.

9.2 In April 2006, CAPART held several consultations with different Ministries, allied agencies and other experts in the field of rural technology regarding the 'Future Role of CAPART', and the 'Vision Statement for Rural Technology'. It was unanimously agreed at the Consultations that Malnutrition was a great impediment to the optimal development of human resources, and in breaking the poverty cycle, especially in rural areas.

9.3 On the basis of the recommendations emerging from these consultations, viz., improving the quality of life of the rural poor through better health, nutrition, education and awareness to ensure that the next generation is free from poverty trap, malnutrition was focused as a major gap area in the life cycle of rural households. CAPART prioritized the issue of Malnutrition as an unaddressed gap in human resource development, and formulated a Model Scheme for Promotion of Community Initiatives to Combat Malnutrition and provide Income Generation in the Backward Regions of India. The Scheme is constructed on the principles of the Inter-generational, Life Cycle Approach, with interventions to address the key stages of life, viz., infancy and childhood, adolescence, and motherhood through Nutritional and Health awareness and administration of low cost, indigenously prepared energy food supplements for the three groups. The objective of the Scheme is to improve the nutritional status of the community by generating awareness regarding the inter-generational cycle of malnutrition and ill health and to build capacities of the Women's Self Help Groups by providing them skills for the production, and distribution of energy foods for consumption and sale. The scheme serves a dual purpose of combating malnutrition as well as providing income generation activity for the Women's Self Help Groups, through whom the production and distribution of energy foods is done in the community. (*Annexure 2*)

9.4 The scheme combines strategies to address the therapeutic and attitudinal issues relating to existing protein-calorie malnutrition in children below 6 years of age; improving the nutritional status of adolescent girls to prepare them for a safer and healthier motherhood and of pregnant mothers through supplementary energy foods and nutritional education and weight monitoring, with the objective of improving the birth weight status of future infants, and preventing future infant and maternal mortality that is related to malnutrition.

10

Pilot Projects: Jawhar and Mokhada Blocks, Thane District, Maharashtra

10.1 CAPART introduced a Pilot Project to be implemented by the NGO MITTRA-BAIF (Maharashtra Institute of Technology Transfer for Rural Areas – Bharatiya Agro Industries Foundation) in 50 villages of Jawhar and Mokhada, two chronic malnutrition Blocks in Thane District of Maharashtra, where in previous years malnutrition deaths were regularly reported.

10.2 The main features of the Scheme are

- Providing information to the community through a strong Health and Nutrition Education module for the care of infants, adolescent girls and pregnant and lactating women
- Providing low cost Supplementary Nutrition of locally prepared, high energy food appropriate to the needs of the 3 critical links, namely, children, adolescent girls, and pregnant and lactating women
- Providing training to Women's Self Help Groups for the production of the energy food and emphasizing its consumption by the 3 groups
- Setting up production units in select villages
- Marketing the surplus in rural markets for other communities to derive the benefits thereof, and for providing income generation for the Self Help Groups

10.3 Methodology

The methodology for implementation is as follows:

10.3 (i) **Baseline survey:** This would profile the nutritional status of the community, and assess the current nutritional level of the target population. It would also form the basis of evaluating the improvement in nutritional status once the project progressed.

10.3 (ii) **Identification and training of volunteers:** Community volunteers, who are the catalysts of the Project, (traditional birth attendants, teachers, village health workers)

would be trained regarding the inter-generational aspects of malnutrition, communication and behavioral change, and the distribution and marketing of energy foods. The Women's Self Help Groups would be the nuclei for implementing the project. They would serve as ideal platforms for the promotion of nutritional messages as well as for the production, consumption, distribution and marketing of the nutritional supplements. Apart from SHGs, other People's Organizations in the area would also be involved in the implementation of the project**.**

10.3 (iii) **Awareness Generation:** Awareness would be generated regarding simple nutrition issues, the inter-generational life cycle approach and proper nutritional intake by the 3 inter-generational groups, and by the community at large, through suitable IEC materials in the form of posters, flip charts, kits, etc., in collaboration with Government Departments, PRIs as well as other NGOs. This would also foster linkages essential for the sustainability of the project.

10.4 Setting up of units for Production, Marketing and Distribution of Energy Foods

10.4 (i) Simple production units consisting of a Grinder, Drier and a Packaging machine would be set up at selected villages for manufacturing energy rich foods based on inexpensive and locally available raw material such as wheat, jawar, ragi, jaggery, peanuts etc. The Women's SHGs would be trained to prepare and package the energy foods in a hygienic manner. Specific compositions would be prepared to meet the specific requirements of the 3 critical groups namely, infants and children, adolescent girls and women. Details of the compositions are at Annexures 3 and 4.

10.4 (ii) **Encouraging Consumption:** In order to improve the nutritional status of the targeted community, top most priority would be given to consumption of the product by children, adolescent girls and pregnant and lactating women. This is important for breaking the inter-generational cycle of malnutrition and ill health. Initially, for the first six months, it was decided to distribute the foods free of cost among the target population. After the first six months, when the benefits of the energy foods would be amply demonstrated in the community by an improvement in their health and well being, the energy food would be sold in the community by the SHGs.

(*The SHGs and the NGO are presently devising a strategy for pricing the energy food for the community, marketing and reaching the break-even point. Already, sales of the product have started in 6 village shops in each Block. The product appears to be in demand, especially for children below 6 years. It is proposed to extend the marketing network to the remaining villages.*)

10.4 (iii) **Rural Marketing:** A major portion of the produce would be utilized for consumption and the surplus would be marketed in rural areas through the networks of the NGO. This would provide a source of income generation for the SHG's and would supplement their family income. The units would be managed by the NGO only for the first one year, after which the SHGs would take over with necessary hand holding by the NGO.

10.5 **Synergy with existing Health and Nutrition Interventions through Governmental and Non Governmental Programmes:** The NGO MITTRA-BAIF is leveraging its existing programmes through its outreach in the Blocks to optimize the outcomes of the project. These would include health and nutrition education, de-worming of children and adolescent girls.

10.6 **Monitoring and Evaluation:** An effective concurrent monitoring and evaluation system has been put in place to ensure that the project is regularly monitored for any mid course corrections. This would also enable the stakeholders of the scheme to understand the required parameters of effective implementation of the project.

11

Project Status: Response of the Community

11.1 The Project is under implementation since September 2006 with the following stages completed:

- Baseline Survey
- Awareness Generation
- Capacity Building of the SHGs for the production and distribution of energy foods
- Setting up of 8 units of production each in the tribal blocks of Jawhar and Mokhada
- Production of energy foods for all the three target groups i.e. infants and children, adolescent girls, pregnant and lactating mothers
- Consumption of energy foods by infants and children commenced in July 2007, and for adolescent girls, pregnant and lactating mothers in September 2007.

11.2 The findings of the Baseline Survey are given below:

Table 11.1: Findings of the Baseline Survey in Jawhar and Mokhada*

Jawhar	Mokhada
Infants (0-12 months)	**Infants (0-12 months)**
About 23.7% of the babies born are low birth weight (weight at the time of birth was less than 2.5 kg.)	About 32.4% of the babies born are low birth weight.
71.7% of the deliveries took place at home.	93.2% of the deliveries took place at home.
99.5% of the mothers fed colostrum to their babies on the first day of delivery[1].	98.8% of the mothers fed colostrum to their babies on the first day of delivery[1].

[1] *This finding is extremely positive, as it is far above the national average of 23.4%. Colostrum is a rich source of nutrients and anti infective factors which protects the infant against infections.*

* The baseline survey covered 100% of the targetted groups in 15 sample villages of Jawhar and Mokhada Blocks.

ι Only 7% of the mothers introduced weaning foods between 6-9 months whereas 93% of the mothers introduced it after 9 months.	ι 16.7% of the mother introduced weaning foods even before 6 months of age. 16.2% introduced weaning foods between 6-9 months and 67.1% of the mothers introduced it after 9 months.
ι Only 4.5% of the infants received complete immunization. 95.5% of infants receive incomplete immunization making them prone to infections and diseases.	ι 27.3% of the infants received complete immunization. 72.7% of infants received incomplete immunization making them prone to infections and diseases.
ι 80.3% of the infants suffered from Grade I malnutrition, 16.1% suffered from Grade II malnutrition and 3.6% suffered from Grade III malnutrition.*	ι 34.2% of the infants suffered from Grade I malnutrition, 54.7% suffered from Grade II malnutrition and 11.1% suffered from Grade III malnutrition.*
Children (1-6 years)	**Children (1-6 years)**
ι 40.4% of the children suffered from Grade I malnutrition. 34.9 % had Grade II malnutrition and the remaining 24.7% had Grade III malnutrition.	ι 20.1% of the children suffered from Grade I malnutrition. 76.1 % had Grade II malnutrition and the remaining 3.8% had Grade III malnutrition.
(It may be noted that during infancy (0-12 months) only 3% of the infants had Grade 3 malnutrition, but as they grew older, the percentage of children suffering from Grade 3 malnutrition has increased to 24.5. This would indicate lack of awareness of proper caring practices, inadequate complementary feeding, worm infestation or infections).	(These figures indicate that the percentage of children with Grade 3 malnutrition has decreased after one year which is extremely positive and indicates awareness regarding proper caring practices, adequate and timely introduction of complementary feeding and better health status of the children.)
Pregnant women	**Pregnant women**
ι Almost 85.8% of the pregnant women had BMI less than 18 thus indicating that the women were malnourished and underweight, and probably did not gain the required amount of weight during pregnancy. In this situation, it would be a near certainty that the newborns would have low birth weight.	ι 35.5% of the pregnant women had BMI less than 18.

* Grades of malnutrition are explained in Annexure 5

ι 3.7% of women were free from anaemia, 70.4% were mildly anaemic and 25.9% were moderately anaemic during pregnancy. ι 46.2% of the pregnant women did not receive any TT Immunization, 49.1% women received only the first dose and 4.7% of the women received both doses. ι All the women were taking folic acid tablets regularly for 90 days.	ι 54.1% of the women were mildly anaemic, 41.6% were moderately anaemic and the remaining 4.3% were severely anaemic during pregnancy. ι 14.4% of the pregnant women did not receive any TT Immunization. 46.1% women received the first dose only and 39.5% of the women received both the doses. ι 77.6% of the women were taking folic acid tablets regularly for 90 days during pregnancy. 18.5% of the women were taking folic acid tablets irregularly and 3.9% of the women were not taking folic acid tablets.
Lactating Women ι 82.4% of the lactating women had BMI less than 18. ι Only 6% of the lactating mothers did not suffer from anaemia. 55.2% were mildly anaemic, 35.8% had moderate form of anaemia and the remaining 3.0% were severely anaemic.	**Lactating Women** ι 35.8% of the lactating women had BMI less than 18. ι 21.4% of the lactating mothers did not suffer from anaemia. 64.3% were mildly anaemic, 14.3% had moderate form of anaemia. None of them were severely anaemic.
Adolescent Girls ι 75% of adolescent girls suffered from mild anaemia and 8.8% suffered from moderate anaemia. 16.2% did not suffer from anaemia of any form. ι 61.9% of the adolescent girls had BMI less than 18.	**Adolescent Girls** ι 57.7% of adolescent girls suffered from mild anaemia and 11.5% suffered from moderate anaemia. 30.8% did not suffer from anaemia of any form. ι 27.9% of the adolescent girls had BMI less than 18.

11.3 Activities in Progress

From the month of July 2007, 25 gm of energy food is being fed to each child from 6 months to 2 years of age and 50 gm of energy food to each child in the age group of 2-6 years, with care being taken by the field workers to ensure that it is supplementary to the existing diet of the children, and not a substitute meal. The weight of the children is being monitored on a monthly basis. Details of the Energy Mix composition for children are at Annexure 3.

11.4 Infants and Children

The Table below reveals the dramatic improvement in the weight of the children since August 2007, after a mere four months of consumption of energy food by children in the two Blocks.

Table 11.2: Weight Monitoring of Children in Jawhar and Mokhada Blocks

Block	Month	Particulars	Normal	Grade1	Grade 2	Grade 3	Grade 4	Total
Mokhada								
	September 07	% of children	22.65	44.06	32.10	1.04	0.15	100
	October 07	% of children	22.87	45.85	30.30	0.87	0.11	100
	November 07	% of children	22.77	46.45	29.87	0.79	0.12	100
Jawhar								
	September 07	% of children	28.74	34.39	35.37	1.30	0.20	100
	October 07	% of children	29.60	39.52	29.84	0.78	0.26	100
	November 07	% of children	30.42	39.55	29.05	0.72	0.26	100

11.4.i The above statistics reveal a steady trend of increase in the number of normal children and children in Grade 1 category of malnutrition from September-November, indicating a shift of Grade 1 malnutrition children into the normal category, Grade 2 children into the Grade 1 category, and Grade 3 children into the Grade 2 category. Regarding the varying numbers of children under Grade 4 malnutrition, we are informed by the Project staff that on account of the immense popularity of the Project, children who were initially not covered by the Project have now sought coverage. Another reason for the fluctuating numbers is that children of the floating population of migrant labour families keep traveling to and from the villages. However, these figures amount to just 0.3 % of the children covered under the programme. 99.7% of the children are permanent beneficiaries of the project, and their weight monitoring has remained constant in the figures presented above. On account of new children with Grade 4 malnutrition joining the programme, it is difficult at this point in time to come to any conclusion regarding progress in their nutritional status.

11.5 Adolescent Girls

Supplementary Energy Mix for the adolescent girls commenced in the month of September 2007. 100 gm. of energy mix, especially prepared to meet the additional Protein and

Micronutrient requirements of adolescent girls was consumed by them daily. Details of the Energy Mix composition are at Annexure 4.

11.5.i The October-November 07 Weight Monitoring results for adolescent girls in Mokhada and Jawhar Block are indicated in the Table below:

Table 11.3: Weight Monitoring Results for Adolescent Girls

Block	Month	Total No. of Adolescent Girls	Increased by 1 kg to 2 kg (%)	Increased by 500 gm to 900 gm (%)	No change in weight (%)	Weight reduced (%)
Mokhada	October 07	375	29.1	51.9	19.0	0.0
	November 07	375	28.1	58.0	13.9	0.0
Jawhar	October 07	332	50.0	37.1	6.9	6.0
	November 07	343	37.8	55.0	5.0	2.2

11.5.ii In Mokhada, 375 girls were given energy foods in the month of September. Amongst these, 29.1% adolescent girls have increased their weight by 1 to 2 kg, and 51.9% of adolescent girls have increased their weight by 500- 900 gm. There was no weight gain among 19% of the girls. On enquiries with the Project Staff, it was ascertained that heavy bleeding during menstruation was a major reason for no weight gain amongst this group. They have now been referred to the nearby hospital for treatment.

11.5.iii In Jawhar, for the month of October, 50% of the adolescent girls increased their weight by 1 to 2 kg, while 37.1% have increased their weight by 500 to 900 gm. For 6.9% of the adolescent girls there has been no change in weight, for the same reason as in Mokhada Block. These have also been referred to the nearby hospital.

11.5.iv The weight monitoring reports for the month of November indicate that there has been a general improvement in the weight of adolescent girls. However, the percentage of girls who gained weight from 1 to 2 kg dropped from 29.1% to 28.1%, and from 50.0% to 37.8% for the blocks of Mokhada and Jawhar respectively, while the percentage of girls who gained weight from 500 gm to 900 gm increased from 51.9% to 58%, and from 37% to 55%, for the blocks of Mokhada and Jawhar respectively.

11.5.v. Though there is clear evidence regarding weight gain in the adolescent girls after just two months of consumption of the Energy Mix, it is premature at this point in time to draw any firm trends.

11.6 Weight Monitoring Results for Pregnant Women

Supplementary Energy Mix for pregnant women commenced in the month of September 2007. 100 gm. of energy mix, especially prepared to meet the additional Protein and

Micronutrient requirements of pregnant women was consumed by them daily. Details of the Energy Mix composition are at Annexure 4.

11.6.i The October-November 07 Weight Monitoring results for pregnant women in Mokhada and Jawhar Block are indicated in the Table below:

Table 11.4: Weight Monitoring Results for Pregnant Women

Block	Month	Total No. of pregnant women	Increased by 1 kg to 2 kg(%)	Increased by 500 gm to 900 gm (%)	No change in weight (%)	Weight reduced (%)
Mokhada	October 07	106	77.5	22.5	0.0	0.0
	November 07	107	32.4	54.4	13.2	0.0
Jawhar	October 07	172	66.3	29.1	2.9	1.7
	November 07	178	48.8	47.0	2.4	1.8

11.6.ii In Mokhada, 106 pregnant women were given energy foods in the month of September. Amongst these, 77.5% pregnant women have increased their weight by 1 to 2 kg, and 22.5% of pregnant women have increased their weight by 500-900 gm.

11.6.iii In Jawhar, for the month of October, 66.3% of the women increased their weight by 1 to 2kg, while 29.1% have increased their weight by 500 to 900 gm. For 2.9% of the pregnant women there has been no change in weight.

11.6.iv The weight monitoring reports for the month of November indicate that there has been a general improvement in the weight of pregnant women. The percentage of women who gained weight from 1 to 2 kg dropped from 77.5% to 32.4%, and from 66.3% to 48.8% for the blocks of Mokhada and Jawhar respectively. On enquiry with the project staff, it was ascertained that the reasons for weight loss among the pregnant women were vomiting during the first trimester of pregnancy and frequent illnesses during pregnancy. The percentage of women who gained weight from 500 gm to 900 gm increased from 22.5% to 54.4%, and from 29.1% to 47.0%, for the blocks of Mokhada and Jawhar respectively.

11.6.v Though there is clear evidence regarding weight gain in the pregnant women after just two months of consumption of the Energy Mix, it is premature at this point in time to draw any firm trends.

11.7 Weight Monitoring of Lactating Mothers

11.7.i Supplementary Energy Mix for the lactating mothers commenced in the month of September 2007. 100 gm. of energy mix, especially prepared to meet the additional Protein and Micronutrient requirements of lactating women was consumed by them daily. Details of the Energy Mix composition are at Annexure 4.

11.7.ii. The October-November 07 Weight Monitoring results for Lactating women in Mokhada and Jawhar Block are indicated in the Table below:

Table 11.5: Weight Monitoring Results for Lactating Mothers

Block	Month	Total No. of lactating women	Increased by 1 kg to 2 kg(%)	Increased by 500 gm to 900 gm (%)	No change in weight (%)	Weight reduced (%)
Mokhada	October 07	226	25.3	62.9	11.8	0.0
	November 07	209	19.2	64.9	15.9	0.0
Jawhar	October 07	242	55.8	35.1	3.7	5.4
	November 07	247	48.0	46.7	3.1	2.2

11.7.iii In Mokhada, 226 lactating women were given energy foods in the month of September. Amongst these, 25.3% lactating women have increased their weight by 1 to 2 kg, and 62.9% of pregnant women have increased their weight by 500-900 gm. For 11.8% of the lactating women, there has been no change in weight.

11.7.iv In Jawhar, for the month of October, 55.8% of the women increased their weight by 1 to 2 kg, while 35.1% have increased their weight by 500 to 900 gm. For 3.7% of the lactating women there has been no change in weight.

11.7.v The weight monitoring reports for the month of November indicate that there has been a general improvement in the weight of lactating women. However, the percentage of women who gained weight from 1 to 2 kg dropped from 25.3% to 19.2%, and from 55.8% to 48.0% for the blocks of Mokhada and Jawhar respectively, while the percentage of women who gained weight from 500 gm to 900 gm increased from 62.9% to 64.9%, and from 35.1% to 46.7%, for the blocks of Mokhada and Jawhar respectively.

11.7.vi Though there is clear evidence regarding weight gain in the lactating women after just two months of consumption of the Energy Mix, it may be premature at this point in time to establish any firm trends.

11.8 Response of the Community on the basis of questionnaires

Simple questionnaires for children, adolescent girls, pregnant and lactating mothers and mothers of infants were designed to elicit the response of the community as to whether they felt a better sense of well being after the consumption of energy foods.

The questions along with the response of the community to the Programme are contained in the following Tables and speak for themselves:

11.9 Lactating Mothers and Pregnant Women

Table 11.6: Response from Lactating Mothers and pregnant Women

Questions	Lactating Mothers						Pregnant women					
	Mokhada (%)			Jawhar (%)			Mokhada (%)			Jawhar (%)		
	Yes	No	Total	Yes	No	Total	Yes	No	Total	Yes	No	Total
Do you feel stronger than before?	90	10	100	100	0	100	100	0	100	100	0	100
Has there been a reduction in the incidence of common diseases? If so, which diseases have decreased?*	90	10	100	100	0	100	100	0	100	90	10	100
Do you feel that you can work for more hours now?	100	0	100	100	0	100	80	20	100	90	10	100
Is there a better feeling of well being?	100	0	100	100	0	100	80	20	100	100	0	100
Do you like the taste of the product?	80	20	100	100	0	100	100	0	100	100	0	100

* Weakness, Arthritis and Headache have decreased

11.10 Adolescent Girls

Table 11.7: Response from Adolescent Girls

Questions	Adolescent Girls					
	Mokhada (%)			Jawhar (%)		
	Yes	No	Total	Yes	No	Total
Do you feel stronger than before?	80	20	100	100	0	100
Has there been a reduction in the incidence of common diseases? If so, which diseases have decreased?*	100	0	100	100	0	100
Do you feel that you can work for more hours now?	100	0	100	100	0	100
Is there a better feeling of well being?	80	20	100	100	0	100
Do you like the taste of the product?	80	20	100	100	0	100
Has there been an improvement in school performance?#	100	0	100	100	0	100
Has there been an improvement in school attendance?	100	0	100	100	0	100
Do you feel that there has been an improvement in your mind concentration?	100	0	100	100	0	100

* Weakness, Body pain and Headache have decreased

\# In Mokhada, only one girl was going to school and in Jawhar two girls were attending school

11.11 Children 6 years and above

Table 11.8: Response from Children 6 years and above

Questions	Children 6 years and above					
	Mokhada (%)			Jawhar (%)		
	Yes	No	Total	Yes	No	Total
Do you feel stronger than before?	95	5	100	100	0	100
Has there been a reduction in the incidence of common diseases? If so, which diseases have decreased?*	90	10	100	100	0	100
Has there been an improvement in school performance?	100	0	100	100	0	100
Has there been an improvement in school attendance?	100	0	100	100	0	100
Do you feel that there has been an improvement in your mind concentration?	95	5	100	100	0	100
Is there a better feeling of well being?	90	10	100	100	0	100
Do you like the taste of the product?	80	20	100	100	0	100

* Weakness, dysentery, fever have decreased

11.12 Mothers of Children below 3 years

Table 11.9: Response from Mothers of Children below 3 years

Questions	Children 6 years and above					
	Mokhada (%)			Jawhar (%)		
	Yes	No	Total	Yes	No	Total
Is your child healthier and stronger than before?	90	10	100	100	0	100
Does the child cry less than before?	90	10	100	90	10	100
Is the child more active now?	100	0	100	100	0	100
Has there been a decrease in the incidence of disease? If so, which diseases have decreased?*	90	10	100	100	0	100
Has there been an improvement in the general well being of the child?	90	10	100	100	0	100

* Weakness, dysentery, fever have decreased

The response of the community indicates that they have a better sense of well being on all accounts. The impact of the supplementary energy food on health, energy, working capacity, school performance and school attendance has been established.

12

Opportunities Lost: The Way Forward

12.1 “While mortality has declined by half, and fertility by two-fifths, malnutrition has only come down by about one-fifth in the last 40 years. The inescapable conclusion is that further progress in human development in India will be difficult to achieve unless malnutrition is tackled with greater vigor and more rapid improvement in the future than in the past”. *(HNP Discussion Paper, India’s Undernourished Children: A Call for Reform and Action, 2005.)*

12.2 “Improvements in nutritional status have not kept pace with progress in other areas of human development for several reasons. First, nutritional status is closely linked to poverty and gender inequity, both of which remain grave problems in India. Second, most malnutrition is less visible than other forms of human suffering, and hence commands less urgent attention. And third, improvements in nutrition require a relatively complicated interrelated set of actions for which substantial capacity, coordination and commitment are essential. Malnutrition ***is now seriously retarding improvements in human development more broadly.”*** *(World Bank 1998: India Wasting Away: The Crisis of Malnutrition in India. Health, Nutrition and Population Unit South Asia Region)*

12.3 The excellent *“Commentary: The Asian Enigma”* by Vulimiri Ramalingaswami, Urban Jonsson and Jon Rhode, begins with the sentence “The key to South Asia’s high rates of child malnutrition is not to be found in the obvious.” While comparing the nature and incidence of malnutrition between Sub Saharan Africa and India, the Commentary concludes that the higher prevalence of Low Birth Weight in India is the key factor causing higher malnutrition in India as compared with Africa. (While approximately one third of all babies in India are born with LBW, in Sub Saharan Africa the proportion is about one sixth, some of which can be put down to malaria.)

12.4 The Commentary makes an extremely obvious and significant comment, not often articulated by social scientists or development experts, that Low Birth Weight reflects “the condition of women, and particularly their health and nutrition, not only during pregnancy but over the whole of their childhood and young lives.” Evidence suggests that while in Africa most women gain around the ideal 10 kilos of weight during pregnancy, in South Asia, the gain is around 5 kilos only. Similarly, the incidence of Iron Deficiency

Anaemia in Indian women is a staggering 83% as compared with 40% in Sub Saharan Africa.

12.5 The paper then tries to identify the reasons as to why the rates of child malnutrition are greater than the incidence of Low Birth Weight and suggests that "social conditions that lie behind low birth weights continue to affect the nutritional well being of the small child." The paper also debunks the myth that lack of food is the only reason for malnutrition. "For most poor families, the real food problem is not lack of food on the table but the inordinate costs, in money, time and energy, of putting it there - meaning that there is too little of any of these resources left over to invest in other aspects of life. In short, the quality of perhaps the most important determinant of a child's proper growth viz., child care suffers along with the quality of women's own lives."

12.6 The three studies quoted above range from the years 1996 to 2005, thereby indicating that intense study and debate has gone into the question of malnutrition in India. There also appears to be a consensus regarding its main causes, and also regarding the enormous economic loss caused to the people and to the country on its account. Why then is India not able to address this problem and instead is slipping down further and further in its nutritional indicators, and being labeled as one of the most malnourished countries in the world?

12.7 Looking back critically in hindsight at State action on this issue, and at our Plans, Policies and Programmes, it would appear that we had four opportunities which we missed through inaction or inadequate action.

12.8 The first opportunity that was missed was failure to implement an extremely critical national strategy prescribed in the Third Five Year Plan (1961-66), viz., "the creation of nutritional awareness regarding proper dietary habits, diversification of dietary habits within the available affordable limits and purchasing power of the people from locally available food." Unfortunately, such a national awareness generation campaign did not take place and has not taken place to this date. Not having acted upon this recommendation has cost us very dearly, and large sections of our populations, both rural and urban, continue to suffer from malnutrition, not on account of poverty and food insecurity, but on account of lack of awareness, ignorance, poor sanitation and unsafe drinking water. A high degree of ignorance persists amongst a large percentage of the population, (both with inadequate and adequate purchasing power) regarding the nutritional needs of infants, children, adolescents and women within a family, during the several stages of growth, development and transition in their lives. It is this nutritional ignorance and information gap regarding the indirect factors affecting nutrition, that is responsible for the fact that the percentage of our population suffering from protein-calorie malnutrition or micro nutrient deficiency such as anaemia, far exceeds the percentage of population below the poverty line.

(*Incidentally, this recommendation was again repeated in the National Nutrition Policy, 1995 and remained on paper*.)

12.9 The second opportunity lost was during the Fifth Plan Period, when the Integrated Child Development Services (ICDS) Scheme originated. As already stated in Para 6.4, all components of the MNP, except Nutrition subsequently became national programmes. One is unclear as to why this happened and can only assume that an impression was created amongst the policy makers that the issue of malnutrition was comprehensively addressed by the ICDS, the expansion of which clearly is the Integrated Child Development Services. This belief has embedded itself in the mind set of the Nodal Ministries and even today Nutrition is looked upon as a peripheral aspect of health or child development and not as an independent development indicator requiring a stand alone National Programme. Hence, the subject of nutrition got subsumed in ICDS and never became a programme by itself. The programmatic components of nutrition remained scattered between the Ministries of Health, Food and Agriculture, and Women & Child Development Division of the Social Welfare Ministry. By the time a separate Department of Women and Child was created, the belief that ICDS was a national programme for the eradication of malnutrition had become so deeply embedded amongst the administrators and policy makers, that it is difficult to remove it even today.

12.10 It may be noted that even the National Common Minimum Programme of the Government of India, May 2004, which highlights the Government's development agenda, contains only fragmented segments related to Food and Nutritional Security. Eradication of malnutrition is not stated as a single point objective and the components of nutrition continue to be scattered between the Mid Day Meal Programme, ICDS and the Public Distribution System. While these are important components of any strategy to eradicate malnutrition, they by themselves are not sufficient to constitute a comprehensive strategy to eradicate it. The National Common Minimum Programme objective that "The UPA will work out, in the next three months, a comprehensive medium- term strategy for food and nutrition security" has obviously not yet materialized.

12.11 The third opportunity lost was the non-implementation of the National Nutrition Policy 1993, and the general apathy to most of the valuable Direct and Indirect Interventions contained therein, particularly, expanding the nutrition intervention net through ICDS; reaching the adolescent girls and ensuring better coverage of expectant women; fortification of essential foods with appropriate micronutrients; popularization of low cost nutritious food, food security and dietary diversification; and nutrition surveillance. This has been explained in detail in Section 7.

12.12 The fourth lost opportunity was in 2001 after former Prime Minister Shri Atal Bihari Vajpayee's announcement on Independence Day 2001 that the Government would launch a National Nutrition Mission. A comprehensive Concept Paper was prepared but not taken forward, and the "National Nutrition Mission" was confined to making available subsidized food grains to adolescent girls and expectant and nursing mothers, belonging to

below poverty line families. Needless to say, the announcement of the Prime Minister was reduced to a complete farce.

What must be done

I. Political Commitment

12.13 The required seriousness and priority for combating malnutrition in India will only accrue if the problem of Malnutrition is articulated as a serious national problem by the highest political leadership as eroding not only our human resources, but also causing enormous economic loss to the country. No doubt, a reference to Malnutrition does find a place in important speeches by national leaders periodically, but only in the limited context of child development or health, which confines it as a social sector issue, consequently pushing it lower in the priority ladder. Economists must be sensitized to the problem of malnutrition and its economic dimensions. Articulation of the problem additionally as an economic issue, particularly when India is striving to become a global economic power, will enhance the political commitment that must act as a follow up to pressurize the administrative machinery to formulate viable and effective strategies to combat it.

12.14 It may be interesting to mention here that the United States of America views the subject of Nutrition as important to National Security. The National School Lunch Programme (NSLP) launched in the United States in 1946 by President Harry S Truman that enables every student in the country to receive nutritious lunch every day in school, came in response to the fact that many American men were rejected for World War II military service because of diet related health problems. An investigation into the health of young men rejected in the World War II draft showed a connection between physical deficiencies and childhood malnutrition. In response to this Congress enacted The National School Lunch Act as a "measure of national security to safeguard the health and well being of Nation's children and to encourage the domestic consumption of nutritious agricultural commodities." The logic of this perception cannot be questioned.

12.15 In the Indian developmental process, political commitment and demand for results is a *sine qua non* for administrative commitment, accountability and programmatic success. As already stated, the National Nutrition Council, headed by the Prime Minister, constituted in 1995, has never met. Since the subject of nutrition is so multi sectoral, no individual Ministry takes complete responsibility for it, and no individual Ministry has so far prepared a comprehensive strategy or programme to address it. It is clear that the sectoral and differentiated approach has not worked, and a Central direction is required if we are to make a significant dent in our nutritional situation.

12.16 Hence, a statement from the highest political leadership that the government is

committed to the eradication of malnutrition within a certain time frame, casting responsibility on the nodal Ministry for drawing a road map to achieve the objectives, and vigorous monitoring of the same, will give it the required priority in the country's development agenda and activate the implementing machinery into action.

II. A National Programme to Combat Malnutrition

12.17 The National Nutrition Council of the Government of India headed by the Prime Minister, should immediately commence the process of formulating a stand alone National Strategy for Combating Malnutrition in India. Experience of the past has proved that including this issue as an add-on to existing Health or Child Development programmes has not created any appreciable impact. The Council could set up a High Powered Committee serviced by the nodal Ministry of Women and Child Development, comprising of nutrition experts, economists, development practitioners, State Government representatives, civil society organizations and NGOs to prepare a programme of action within a certain time frame. Consultations at National and State level would help in making it a public issue and would serve as an effective advocacy tool for the programme.

12.18 The programme of action must be implemented in a mission mode, with monitorable, time bound targets and milestones, casting responsibility and accountability on the nodal ministry, through vigorous review and monitoring of performance. This would also further enhance public awareness of the programme and activate the States to become partners. Experience has shown that Central Government development programmes under the Central Sector or Centrally Sponsored Schemes are quickly supplemented by State Governments through their own budgets. The ICDS is a proven example of this.

12.19 The preparation of such a National Programme should not be particularly challenging, as with very little effort, several critical and significant recommendations made in previous Five year Plans, and in the existing National Nutrition Policy can be assembled, with required adjustment in keeping with the contemporary socio economic situation and in the context of the evolution of Panchayati Raj institutions.

III. Components of the National Plan to Combat Malnutrition

1. Awareness Generation and Public Information

12.20 The first component of the strategy to combat malnutrition should primarily contain a vigorous awareness generation campaign by the Central and State Governments, using various streams of media for providing information to the common people regarding proper dietary habits within their affordable limits and purchasing power and popularization of low cost nutritious food from locally available raw material. Information would have to be customized to local conditions, food habits and indigenously available foods. The

nuances of the inter-generational cycle of malnutrition must be informed to the communities, as also the importance of exclusive breast feeding, timely introduction of complementary food, proper child care practices, complete immunization, maternal care, safe drinking water, hygienic sanitation, etc. An awareness campaign while providing information to the general public would immediately address that segment of malnutrition that results not from lack of purchasing power, but from lack of information. Needless to say, the media campaign to be effective, must be imaginative, target specific and customized to geographical, agro climatic, and cultural realities.

12.21 Male malnutrition in the intrinsic sense flows out of female malnutrition. The genesis of male malnutrition lies in the inter-generational cycle of malnutrition linking the malnourished mother, adolescent girl, and the low birth weight girl child, aggravated by all other direct and indirect factors described in the Paper. As per NFHS 3 data, 28.1% men have low body mass index, indicating chronic energy deficiency, and 24.3% suffer from anaemia, indicating lower energy levels. The fact that the seeds of male malnutrition lie in female malnutrition, specifically maternal malnutrition trapped in the inter-generational cycle, is an additional fact that should be informed to the population at large.

2. Direct Interventions

(i) Supply of Low Cost Energy Foods to the Vulnerable Groups

12.22 To secure immediate results and create a positive impact on the community, the author believes that for any strategy to be immediately successful within one generation, there is no substitute for providing energy foods to the three vulnerable links in the cycle of malnutrition, namely, infants and children, adolescents and expectant/ lactating women in the project area. The cost of Energy Food made from locally available produce amounts to Rs.24 per kg at present day prices. The recommended portion for children (50 grams) costs a mere Rs.1.20 per day and Rs.2.40 per day for the other two groups. The feeling of physical well being among the community is immediate as is evident in the data presented in Section 11. This by it self acts as the strongest advocacy for the programme among the community by raising awareness levels based on a special conviction arising from personal experience, thereby requiring few external advocacy tools. This component of the National Programme flows directly from the recommendation of the National Nutrition Policy Para 7.2.(iii)

(ii) Food Fortification

12.23 Food Fortification of Essential Foods with appropriate nutrients, such as, salt with iodine and/or iron, and intensification of research in iron fortification of rice and other cereals. This recommendation flows from the National Nutrition Policy (Para7.2 ii) and must be implemented as a component in the National Strategy

12.24 A study of the debate on food fortification in the last three decades reveals a sense of needless vacillation and double standards. While no comment is made by public health experts on fortification of the category of foods consumed by the moneyed class, the question of fortification of foods consumed by the poor always appears to become controversial. The usual bogey of granting undue access to multinational pharmaceuticals is cited, while India's poor continue to be the losers, and the country loses valuable time.

12.25 There is a vast amount of literature that establishes that food fortification pioneered by the pharmaceuticals and supported by governments, was primarily responsible for overcoming micronutrient malnutrition that had set in Europe after the Second World War and in the United States after the Great Depression. So too, food fortification has been an important intervention in the South Asian countries, such as Thailand, Indonesia and the Philippines, to successfully address malnutrition. No doubt, food fortification for the poor was easier in South Asia since food habits are more homogenous, and their staple food, noodles, can be fortified much more easily than the variety of home ground cereals and pulses that are consumed by the poor across India. The fortification of rice continues to be a challenge. However, with some innovation and political will, it is possible to fortify chakki ground wheat with essential Vitamin-Mineral mixes, or provide recommended quantities of Vitamin-Mineral mixes in sachets for sprinkling on whatever food the poor eat. (This strategy was recommended by the author to the Micronutrient Initiatives in their Nutrition Project in Gujarat and West Bengal, and has proved successful.) In recent years, food corporates in India, such as, Britannia and Hindustan Lever have made significant inroads in rural markets. A quick survey would reveal the kinds of packaged foods commonly consumed by rural and urban poor communities. Appropriate fortification of such foods would accelerate the reduction of micronutrient deficiencies, particularly among the poor.

12.26 A comprehensive policy regarding fortification of common foods consumed by the rural and urban poor should be finalized by the National Nutrition Council, drawing from the several success stories and experiences from other countries that have used this strategy

(iii) Popularization of Low Cost Nutritious Food

12.27 Popularization of Low Cost Nutritious Food from indigenous and locally available raw materials with the involvement of women is yet another prescription of the National Nutrition Policy that has remained unattended. The process is simple, cost effective and yields immediate results. It is precisely this intervention that has been used in the Pilot Projects in Jawhar and Mokhada, and its success is clearly evident from the results. (Section11) The cost at present day prices is Rs 24 per kg, capital investment for machinery is Rs 10,60,500/- for 8 centres per block and training time for SHGs is 3 days.

After consumption by the community, the surplus could be sold at nearby rural markets and form an important income generation activity for the Women's Groups. This could be promoted as a priority activity in the several SHG programmes being run by the Central and State Governments. The Awareness Campaign can be used as a marketing strategy for popularizing the product, particularly in rural areas.

12.28 The National Strategy should also involve the corporate sector through the Corporate Social Responsibility Scheme for production and popularization of inexpensive, energy rich food mixes, particularly complementary foods for infants, and iron rich foods for adolescent girls and pregnant women. Easy availability of such foods in rural markets would greatly facilitate implementation of the programme. If large corporate houses have been successful in capturing rural markets for consumer products, such as soaps, shampoos and toothpaste, that have merely cosmetic value, they could be equally successful in marketing energy rich food mixes, the benefits of which would be felt by the community immediately.

(iv) Control of Micronutrient Deficiencies amongst Vulnerable Groups

12.29 Coverage of the existing Vitamin A Supplementation Programme, the National Nutritional Anaemia Programme and de-worming must increase drastically through intensification and complete coverage. (NNP Para7.2.iv) This is already a priority area in the National Rural Health Mission, and should be monitored rigorously.

12.30 Other National Programmes that have indirect impact on the nutritional status of the people such as Immunization Programmes, Water Sanitation programmes viz., Total Sanitation Campaign and Swajaldhara should be accelerated.

(v) Implementation Machinery

12.31 The natural implementation agency for the National Programme would obviously be the ICDS with its nationwide grassroots network, but with a difference that is elaborated in the subsequent text.

12.32 The mandate of the ICDS, as the name of the programme suggests, is Integrated Child Development. It is NOT the eradication of malnutrition, which as we have discussed goes far beyond integrated child development. Proper child development presupposes proper maternal development, which presupposes proper adolescent development of the mother. This takes us to the inter-generational cycle of malnutrition, a strategy that is not sufficiently emphasized in any of our nutrition or health programmes today, whether from the advocacy or the programmatic perspective. It would be completely logical to state the premise that an inter-generational problem would require an inter-generational solution. This concept and strategy must underpin the policy and programmatic perception for the eradication of malnutrition, and in the ICDS.

(The author was Government of India's representative for negotiating the Outcome Document, 'A World fit for Children' for the UN General Assembly Special Session on Children held in May 2002 (UNGASS), and was singularly responsible for incorporating the concept of an inter-generational approach for addressing the problem of malnutrition, hoping that the concept would percolate into nutrition related programmes. It is hoped that this approach is examined seriously by policy makers as the quickest and surest strategy for combating the problem of malnutrition in India, by explicitly using it as a base for future programmes.)

12.33 The objectives of the ICDS as defined in 1975 remain unchanged even today. These are:

- To improve the nutritional and health status of pre-school children in the age-group of 0-6 years;
- To lay the foundation of proper psychological development of the child;
- To reduce the incidence of mortality, morbidity, malnutrition and school drop-out;
- To achieve effective coordination of policy and implementation amongst the various departments to promote child development; and
- To enhance the capability of the mother to look after the normal health and nutritional needs of the child through proper nutrition and health education

12.34 It would therefore be essential that a process of thoroughly restructuring and reorienting the ICDS be initiated to make it more responsive to present day developmental needs, in the nature of an ICDS Plus. In its present form, eradication of malnutrition is not one of its primary mandates. If the ICDS will be the Governmental agency to implement the National Plan to eradicate Malnutrition, its mandate must be amended to cast upon it the responsibility for eradicating malnutrition and to addressing its direct and indirect causes at the village level. The approach should be inter-generational, so as to provide nutritional supplementation to the 3 critical links, and capsule all other components in a holistic strategy.

12.35 This takes us to the question as to whether it is possible for a single Anganwadi worker with one assistant to handle the additional responsibility that will be placed on her. Presently, as per her charter of duties, she must record children's weight, attend to providing nutrition and pre school education, administer IFA tablets to pregnant women, deworming medicine to children, reach out to pregnant and nursing mothers, make home visits, provide nutrition counseling, help with immunization campaigns, attend Self Help Group meetings, carry out surveys, attend PRI and Block level meetings, maintain food stock registers and accounts. In addition, she is frequently mobilized by other government departments for special duties, such as storing grain or meeting targets for setting up Self Help Groups. Though one might wonder as to how much time she can really spend on

her main responsibilities on maternal and child development, these responsibilities will remain unchanged. Her additional responsibilities for the eradication of malnutrition in the community at large, would involve awareness generation regarding the inter-generational cycle, promoting colostrum feeding and timely introduction of complementary foods for infants, weight monitoring of all adolescent girls and pregnant women, preparation of energy foods for children, adolescent girls and pregnant/lactating women through SHGs, assisting SHGs in the marketing of energy foods and nutrition counseling.

12.36 For these responsibilities, it is suggested that 2 trained assistants from the village or from nearby villages be hired on contract basis for a period of 3-5 years with a modest stipend (to fit into the ICDS hierarchy) with defined deliverables within a specified timeframe. Training could be provided to the assistants as per the Training Module available at CAPART's website www.capart.nic.in through NGOs or established Training Institutions in the country.

12.37 The challenge is not insurmountable. To begin with, the programme could be taken up in 100-150 most malnourished blocks of the country. In Blocks where the AW is strong, the ICDS may be given the responsibility for implementation of the programme. In Blocks that are not still covered by ICDS, or where the programme is non-functional, an NGO or the Corporate Sector under CSR may be selected. There has been a mushrooming of good NGOs are the grassroots level, who are looking for meaningful activity in the villages. The programme cost for each Block works out to approximately Rs 34,49,500/- per annum inclusive of Rs 16,00,000/- for marketing, and Rs 51,74,25,000/- for 150 Blocks. The costing is inclusive of additional staffing for 2 assistants, the intervention costs, the working capital and marketing costs, and the media strategy for mass awareness generation (Detailed costing for one block is at Annexure 1.) Each block could have a central monitoring unit for monitoring the programme.

3. Nutrition Monitoring and Surveillance

12.38 A computerized Central and Block level monitoring system can be devised with deliverables, targets, and timeframes. An effective concurrent monitoring system through an external agency can also be established for measuring outcomes, and for effecting changes and mid-course corrections.

12.39 At the AW level, community based nutrition monitoring and surveillance through ICDS infrastructure could include growth monitoring of infants and pre-school children, weight monitoring of adolescent girls and pregnant women, reduction in anaemia levels, etc.

12.40 This would also create a data base on the nutritional status of children, adolescents and women in each AW.

Conclusion

I am confident that the National Strategy for the Eradication of Malnutrition in India as conceptualized in this Paper is viable, implementable and sustainable. It is prepared in the realistic context of governmental functioning, the ICDS template, and the NGO interface, taking note of the constraints inherent in the processes of all three.

The Paper deliberately does not go into the issue of Food Security and the Public Distribution System, as this issue is already receiving high level attention. The Strategy can be implemented even as the Food Security issue, which is paramount, is being addressed.

So too, the Paper does not go into Human Rights perspective, as it tries to focus on the **action** that the Government must take to start the process of combating malnutrition in the country. To my mind, informing people that they have a human right to nutrition, without informing them what they should demand, and without having something to satisfy that demand, would not result in the reduction of malnutrition. A Human Rights Approach can follow after Government initiates meaningful action.

As far as funding is concerned, government planners and financers could note that the economic cost of malnutrition to the country far exceeds the amount required to eradicate it.

Poverty in India has historic causes, and malnutrition is poverty's child. Hence, the roots of malnutrition are deeply embedded in poverty and all its social ramifications, such as, illiteracy and ignorance, gender discrimination, the poor health of women, and lack of maternal care.

It is my earnest hope that this Paper catches the attention of important policy makers and economists and triggers Governmental action.

Bibliography

1. Administrative Staff College of India and Asian Development Bank (1998): *National Strategy to Reduce Malnutrition*
2. Bishai, D., Nalubola, R. (2003): The History of Food Fortification in the United States: Its Relevance for Current Fortification Efforts in Developing Countries. *Economic Development & Cultural Change*, pp 38-53
3. Fogel, R.W. (1990): The Conquest of High Mortality and Hunger in Europe and America: Timing and Mechanisms. NBER Working Paper Series on Historical Factors in Long Run Growth, Working Paper No 16.
4. Hill, D.H., Webb, P., Harvey, P., Hunt, M. J., Dalmiya, N., Chopra M., Ball, M. J., Bloem, M. W., Bruno de Benoist (2005): Micronutrient Deficiencies and Gender; Social and Economic Costs. *American Journal of Clinical Nutrition*, Vol. 81 (suppl), pp 1198S-1205S
5. Hindustan Times, December 19, 2006, New Delhi, pp12
6. Hindustan Times, January 02, 2007, New Delhi, pp 13
7. Indian Council of Medical Research (2002): *Nutrient Requirement and Recommended Dietary Allowance for Indians*, National Institute of Nutrition, Hyderabad.
8. International Institute of Population Studies and ORC Macro (2007): *National Family Health Survey (NFHS-3)*, 2005-06. Mumbai
9. International Institute of Population Studies and ORC Macro (2000): *National Family Health Survey (NFHS-2)*, 1998-99. Mumbai
10. International Institute of Population Studies and ORC Macro (1995): *National Family Health Survey (NFHS-1)*, 1998-99. Mumbai
11. Kennedy, E. Mannar, V., Iyengar, V. (2003): Alleviating Hidden Hunger: Approaches that Work. *IAEA Bulletin*, Vol 45, No 1, pp 54-60
12. Knapp, V.J. (1998): Life Expectancy, infant mortality and malnutrition in pre industrial Europe: A contemporary Explanation. *Nutrition Health*, Vol.12 No 2. pp 89-95
13. Kumar, A.K. (2007): Why are Levels of Child Malnutrition Not Improving? *Economic & Political Weekly*, April 14 2007.
14. Mason, J., Hunt, J., Parker, D., Jonsson, U. (2001): *Improving Child Nutrition in India, ADB Nutrition and Development Series No. 3.* Asian Development Bank, United Nation's Children's Fund, New York, USA.

15. Ministry of Health and Family Welfare (2006): *Report of the Working Group on Public Health Services for the XI the Five Year Plan*. Government of India

16. Ministry of Human Resource Development (2002): *The Indian Child: A Profile 2002*. Department of Women and Child Development, Ministry of Human Resource Development, Government of India.

17. National Institute of Nutrition (1991): *Report of NNMB Repeat Surveys* (1988-90), ICMR Hyderabad

18. National Institute of Public Cooperation and Child Development (2006): *Three Decades of ICDS- An Appraisal*, New Delhi

19. National Sample Survey Organization (1996): *Nutritional Intake in India, NSS 50th Round*, July 1993- June 1994.

20. Pandav, C.S, Anna Somos- Krishnan, Chakrabarty A., Karmarkar M.G.: *Universal Salt Iodization (USI): The Development Paradox of India. Quest towards Sustainable and Permanent Solutions of Eliminating Iodine Deficiency Disorders (IDD) through ownership transfer* (Unpublished).

21. Planning Commission (2001): *National Human Development Report* 2001, Government of India

22. Planning Commission (2006): *Towards Faster and More Inclusive Growth. An Approach Paper to the 11th Five Year Plan*

23. Radhakrishna, R., Ravi, C. (2004): 'Malnutrition in India: Trends and Determinants', *Economic and Political Weekly*, February 14

24. Ramalingaswami, V., Jonsson, U., Rhode, J. (1996): Commentary: The Asian Enigma. *Progress of Nations*, 1996, UNICEF NY

25. Registrar General (2006): *Sample Registration System Bulletin*, October 2006, 41(1)

26. Registrar General (2001): *Maternal Mortality in India 1997-2003 for 2001-03, Trends, Causes and Risk Factors*. Sample Registration System, New Delhi

27. Registrar General, Vital Statistics Division, (2000): *Survey of Causes of Death (Rural)*. Annual Report 1997. New Delhi. pp28

28. Gillespie, S. (1997): *Malnutrition in South Asia: A Regional Profile*, Rosa Publication No 5, UNICEF

29. UNDP (2007): *Human Development Report* 2007-08, UNDP, NY

30. UNDP (2006): *Human Development Report* 2006-07, UNDP, NY

31. UNDP (2005): *Human Development Report* 2005-06, UNDP, NY

32. UNDP (2004): *Human Development Report* 2004-05, UNDP, NY

33. UNDP (2003): *Human Development Report* 2003-04, UNDP, NY

34. UNDP (1998): *Human Development Report* 1998-99, UNDP, NY

35. UNDP (1996): *Human Development Report* 1996-97, UNDP, NY.

36. UNESCAP, ADB, UNDP (2007): *The Millennium Development Goals: Progress in Asia and the Pacific* 2007, UNESCAP, Bangkok

37. UNICEF (2006): *The State of the World's Children* 2006, UNICEF, NY

38. UNICEF and Micronutrient Initiative (2004): *Vitamin and Mineral Deficiency: A Global Progress Report*, Oxfordshire UK

39. United Nations System Standing Committee on Nutrition (SCN) (2004): *5th Report on the World Nutrition Situation: Nutrition for Improved Development Outcomes*

40. United Nations University Press (2000): Ending Malnutrition by 2020: An Agenda for Change in Millennium. Final Report to the ACC/SCN by the Commission on the Nutrition Challenges of the 21st Century. *Food and Nutrition Bulletin,* Vol. 21 No. 3 (suppl)

41. Vepa, S.S. (2007): Is Hunger Real or Imaginary. *The Economic Times*. 6 July 2007. pp8

42. Wiesmann, D. (2006): *Food Consumption and Nutrition Division Discussion Paper 212.* International Food Policy Research Institute, Washington, DC, USA

43. World Bank (2005): *World Development Report: Equity and Development*

44. World Bank (2005): *Health, Nutrition and Population (HNP) Discussion Paper*.

45. World Bank (1998): *India Wasting Away: The Crisis of Malnutrition in India.* Health, Nutrition and Population Unit, South Asia Region

46. World Health Organization (1985): *Energy and Protein Requirements,* Report of a Joint FAO/WHO/UNU Expert Consultation, Technical Report Series 724. Geneva

Websites:

47. http://www.capart.nic.in

48. http://www.planningcommission.nic.in

49. http://www.censusindia.net/

50. http:// www.un.org/

51. http://www.unicef.org/specialsession/wffc/

52. http://hdr.undp.org/hdr2006/

53. http://www.nutraingredients-usa.com

54. http:// wcd.nic.in/icds.htm

55. http:// www.education.nic.in/mdm/mdm.sp

56. http:// education.nic.in/Annualreport2004-05/EEduLit.pdf

57. wcd.nic.in/KSY/ksyintro.htm

58. http:// mohfw.nic.in/annualrep%20english/chap5.pdf

Glossary

ADB	Asian Development Bank
AIE	Alternative and Innovative Education
ANC	Antenatal Care
ANM	Auxiliary Nurse and Midwife
ANP	Applied Nutrition Programme
AWC	Anganwadi Centre
AWW	Anganwadi Worker
BAIF	Bharatiya Agro Industries Foundation
BMI	Body Mass Index
BPL	Below Poverty Line
BMR	Basal Metabolic Rate
CAPART	Council for Advancement of People's Action and Rural Technology
CD	Community Development
CED	Chronic Energy Deficiency
CIPART	CAPART Institute for Poverty Alleviation and Rural Technology
DALY	Disability Adjusted Life Years
DPT	Diphtheria Pertusis Tetanus
EGS	Educational Guarantee Scheme
EIUS	Environmental Improvement of Urban Slums
FAO	Food and Agricultural Organization
GDP	Gross Domestic Product
GOI	Government of India
HDI	Human Development Index
HDR	Human Development Report
HNP	Human Nutrition Population
ICDS	Integrated Child Development Services
ICMR	Indian Council of Medical Research

ICN	International Conference on Nutrition
IDA	Iron Deficiency Anaemia
IDD	Iodine Deficiency Disorder
IEC	Information Education and Communication
IFA	Iron and Folic Acid
IFPRI	International Food Policy Research Institute
IIPS	International Institute of Population Studies
IMR	Infant Mortality Rate
IUD	Intra Uterine Devices
LBW	Low Birth Weight
LHV	Local Health Visitor
MDG	Millennium Development Goals
MITTRA	Maharashtra Institute of Technology Transfer for Rural Areas
MMR	Maternal Mortality Rate
MNP	Minimum Needs Programme
MOHFW	Ministry of Health and Family Welfare
NBER	National Bureau of Economic Research
NCHS	National Centre for Health Statistics
NFHS	National Family Health Survey
NGO	Non Governmental Organization
NIPCCD	National Institute of Public Co-operation and Child Development
NNMB	National Nutrition Monitoring Bureau
NSLA	National School Lunch Act
NSLP	National School Lunch Programme
NSSO	National Sample Survey Organization
ORS	Oral Rehydration Salt
PDS	Public Distribution System
PEM	Protein Energy Malnutrition
PHC	Public Health Centre
PIL	Public Interest Litigation
PNC	Post Natal Care
PUCL	Public Union for Civil Liberties

RCH	Reproductive and Child Health
RDA	Recommended Dietary Allowances
SCN	Standing Committee on Nutrition
SHG	Self Help Group
SRS	Sample Registration Sysytem
UNDP	United Nations Development Programme
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
UNGASS	United Nations General Assembly Special Session on Children
UNICEF	United Nations International Children's Fund
UNU	United Nations University
UPA	United Progressive Alliance
VAD	Vitamin A Deficiency
WHO	World Health Organization

Annexure 1

Nutrition/Immunization Indicators and Female Education Level

(i) Infant Mortality Rate and Under 5 Mortality Rate by Mother's Education Level

Mother's Education	Infant Mortality Rate	Under 5 Mortality Rate
No education	61.3	81.4
< 5 years complete	53.3	59.4
5-7 years complete	48.1	55.2
8-9 years complete	31.2	35.7
10-11 years complete	24.5	28.7
12 or more years complete	23.6	28.2

(ii) Stunting/ Wasting and Underweight among children under 5 years age by Mother's Education Level

Mother's Education	Stunting Percentage below -2	Wasting Percentage below -2	Underweight Percentage below -2
No education	57.2	22.7	52.0
< 5 years complete	50.4	20.8	45.8
5-7 years complete	45.6	18.8	38.5
8-9 years complete	40.7	17.5	34.9
10-11 years complete	33.0	14.3	26.8
12 or more years complete	21.9	12.8	17.9

(iii) Anaemia among children aged 6-35 months by Mother's Education Level

Mother's Education	Anaemia (%)
No education	74.5
< 5 years complete	68.8
5-7 years complete	69.4
8-9 years complete	64.8
10-11 years complete	61.8
12 or more years complete	55.4

(iv) Malnutrition among women by Education Level

Women's Education	BMI less than 18 (%)	Anaemia (%)
No education	41.7	60.1
< 5 years complete	37.2	58.1
5-7 years complete	34.1	56.0
8-9 years complete	35.0	52.4
10-11 years complete	29.4	49.2
12 or more years complete	21.8	44.6

(v) Percentage of children who received vaccines by Mother's Education Level

Mother's Education	BCG	DPT			Polio				Measles	All basic vaccines
		1	2	3	0	1	2	3		
No education	64.7	61.4	49.9	36.9	32.5	90.3	84.9	74.1	41.0	26.1
< 5 years complete	80.9	80.1	69.4	57.3	49.7	90.5	85.2	75.4	58.7	46.1
5-7 years complete	87.1	86.1	77.3	64.6	55.1	94.6	91.4	78.8	69.2	51.8
8-9 years complete	90.9	90.2	82.7	73.0	63.1	96.3	93.3	82.4	75.1	59.7
10-11 years complete	95.3	93.4	86.9	80.0	68.5	97.0	93.0	83.5	82.6	66.1
12 or more years complete	97.5	96.1	93.3	86.6	79.7	99.0	97.1	89.9	89.3	75.2

(vi) Percentage of children aged 12-35 months who were given Vitamin A supplements in last 6 months Mother's Education Level

Mother's Education	Children aged 12-35 Month who were given Vitamin A supplements (%)
No education	18.1
< 5 years complete	26.4
5-7 years complete	28.9
8-9 years complete	33.4
10-11 years complete	33.9
12 or more years complete	35.4

Source: NFHS 3 (2005-06)

Annexure 2

Promotion of Community Initiatives to Combat Malnutrition and Provide Income Generation in the Backward Regions of India

1. Introduction

1.1 India has one of the highest incidences of malnutrition in the developing world today, caused by a combination of lack of information and awareness, poverty as well as absence of an adequate and balanced diet. This results in malnutrition and under nutrition, which retards physical and cognitive development of infants and children, reduces the work capacity and productivity among adults and enhances mortality and morbidity rates among children, women and men. Such reduced productivity translates into reduced earning capacity, leading to further poverty and the vicious cycle is perpetuated.

2. Health and Nutritional Status in India

2.1 The health and nutritional status of the population of a nation is an important indicator of the development of the country. Mortality rates, micronutrient deficiencies and malnutrition status are some of the important indicators that can be used to assess the health status of a country.

2.2 Under Nutrition

2.2.i. Under nutrition is an important factor responsible for high infant and maternal mortality rates and low birth weight in children. According to NFHS 2 data, 40.6% of the Indian rural women are underweight. This clubbed with early and frequent child bearing becomes an important factor towards maternal mortality and low birth weight children.

2.2.ii Anaemia is prevalent among 57.4 of the rural women (NFHS 3), out of which 1.9% suffer from severe anaemia whereas 39.8% suffer from mild anaemia. Almost 49.7% of Indian pregnant women are anaemic with 2.2% suffering from severe form of anaemia. Anaemia has detrimental effect on the health of women and children and is an important cause for maternal and perinatal mortality. Anaemia also results in an increased risk of premature delivery and low birth weights (Sheshadri, 1997). One of the direct consequences of anaemia is low energy, hence low economic productivity.

2.3 Maternal Mortality Rates

2.3.i Worldwide about 500,000 women die every year from pregnancy and childbirth related causes and most of these deaths occur in developing countries (WHO 1999). The average maternal mortality ratio at the national level for the two-year period preceding NFHS 2 is 540 deaths per 100,000 live births. The rural MMR (619) is much higher as compared to the urban MMR (267). The reason for this is attributed to under nutrition, lack of access to health care facilities and immunization, and lack of awareness regarding healthy nutritional practices. According to NFHS 2 data, 39.8% of the rural women do not receive any antenatal check ups during pregnancy, thus, contributing to increased MMR and IMR.

2.4 Low birth weight

2.4.i 22.7% of the infants born in India are of low birth weight. They are at a far higher risk of dying in early infancy. Even if they survive, they are less likely to catch up on the lost growth and are prone to a number of development deficits**.** Further, non-feeding of colostrum increases the risk of neonates to catch infections. According to NFHS 3 data, only 64.5% of the rural women and 51.9% of the urban women feed the infant colostrum. The problem is further aggravated as complementary feeding is delayed, often well past the first year.

2.5 Infant and Child Mortality Rates

2.5.i Infant and child mortality rates reflect a country's level of socio-economic development and quality of life, and are used for monitoring and evaluating health programmes and policies. Neonatal mortality rates, infant mortality rate, child mortality rate, under-five mortality rates are used to estimate infant and child mortality. India has an infant mortality rate of 57 per 1000 live births. The infant mortality rate for rural areas is 62.0 compared to 42.0 for urban areas. Children in the rural areas of India experience a 70% higher probability of dying before the fifth birthday as compared to urban children, clearly indicating the need for strengthening rural health, nutritional and anti-poverty programmes. Over the years there has been an overall decline in infant and child mortality rates. However, they are still much higher in India as compared to other countries. For instance, the IMR in the US is 6.0 per 1000 live births (Centre for Disease Control, 2000). Even Mexico and China - comparable countries- have much lower IMR of 25 and 23 respectively.

All these factors are related to malnutrition and under nutrition and are passed on from one generation to the next, resulting in a vicious cycle of malnutrition and ill health.

3. Inter-generational Cycle of Malnutrition & ill Health

3.1 The problem of malnutrition is all the more critical as it is invisible and inter-generational, meaning thereby, that it is passed on from one generation to the next. A girl

child born in a rural family is more likely to be born with low birth weight (less than 2.5 kg). She is at a far higher risk of dying in early infancy. Even if she survives, she is less likely to catch up on the lost growth and will be prone to a number of development deficits.

3.2 Further, non-feeding of colostrum increases the risk of the neonate to catch infections. The problem is further aggravated as complementary feeding is delayed.

Figure 3.1: The Intergenerational Cycle of Malnutrition & Ill Health

3.3 In addition to timely weaning, the quantity and quality of feed is equally important for the proper growth of the infant. On account of poverty and ignorance, the child is fed inappropriate and inadequate quantity of complementary food, which will be insufficient to meet the increasing nutritional needs of the child. Further, if the feed is not prepared hygienically with clean water and in clean utensils, the child will be more prone to infections.

3.4 The problem is further aggravated in the case of a girl child who is likely to be meted inferior treatment vis a vis the boy child. By the time the girl grows up to be an adolescent, she is likely to be malnourished and anaemic with irreversible cognitive and physical damage. Often, she is married off quite early, which results in early child bearing and multiple pregnancies. Since the mother is malnourished and anaemic, it has an unfavorable affect on the foetus, which suffers from Intrauterine Growth Retardation, and results in low birth weight.

3.5 An undernourished child is more prone to infections. Infections increase the energy demand of the body, which if not fulfilled results in further malnutrition. Malnutrition further lowers immunity and makes the child more susceptible to infection. Lack of safe drinking water, poor personal and domestic hygiene continue to be major causes of intestinal diseases and infections and worsen the condition of malnutrition.

4. Strategy for Combating Malnutrition: Dual Approach

4.1 With this background, addressing the problem of malnutrition through a piecemeal approach would not work. Poverty and unemployment are root causes of malnutrition, but not the only causes. While all poor people are likely to be malnourished, all malnourished people may not be poor. Therefore CAPART proposes to introduce the project to combat malnutrition in backward areas, which would serve a dual purpose of combating malnutrition as well as providing an income generating activity to SHGs. The objective of the scheme is to generate awareness and improve the nutritional status of the community, and also to provide skills for income generation in order to improve the quality of life of the people. The project will be implemented by an NGO through SHGs and will cover 1 Block.

4.2 Objectives

- To determine the malnutrition status of the area and establish the major factors leading to malnutrition
- To identify and train volunteers from the communities regarding various aspects of malnutrition and its management
- To build awareness in the community about nutrition issues and the inter-generational, life cycle approach and to facilitate behavioral changes
- To start an income generation activity by setting up units for production of high quality energy foods for distribution to the vulnerable groups
- To strengthen the women SHGs and People's Organizations (POs) of local communities to address these issues and to ensure the sustainability of project initiatives

4.3 Methodology

4.3.i Baseline surveys

The Project will be initiated by conducting a baseline survey in the target villages. The Base Line Survey would include:

- Rapport building
- Estimating the prevalence of protein energy malnutrition as well as anaemia in children aged 0-6 years, adolescent girls and women.
- Understanding nutritional and child feeding practices of the community
- Mapping the various resources available in area

4.3.ii Identification and training of volunteers

The key to implement the project would be the volunteers, who will be selected from the respective communities. These volunteers could be traditional birth attendants, village health guides, school teachers, etc. They would be trained in various aspects of malnutrition, behavioral communication change and marketing and distribution of energy foods. They would act as resource persons for the village and would play a crucial role in creating awareness regarding proper nutritional practices. The SHGs would be the nuclei for implementing the project. They would serve as ideal platforms for the promotion of nutritional messages as well as for the production, distribution and marketing of the energy foods. Apart from SHGs, other POs in the area, such as Mahila Mandals, Youth Clubs, and PRIs could also be involved**.**

4.3.iii Awareness generation

Awareness would be generated in the project areas regarding nutrition issues, the inter-generational life cycle approach and about proper nutritional intake.

This can be done through suitable IEC materials in the form of posters, flip charts, kits etc. Other events like camps, puppet shows, folk theatre, and celebration of World Health Day or Nutrition Week could be organized to improve community participation. These events may be conducted in collaboration with Government Departments, PRIs as well as other NGOs, which would foster linkages essential for the sustainability of the project.

4.3.iv Setting up Units for Production, Marketing and Distribution of Energy Foods

Production Units would be set up for the SHGs for manufacturing energy rich foods based on inexpensive and indigenous raw material, such as, wheat, jawar, ragi, jaggery, peanuts soya, etc. Specific compositions would be prepared to meet the specific requirements of the 3 critical groups namely, infants and children, adolescent girls, and women. These units would also provide a source of income generation for the SHG's and would supplement their family income. Increased income would help in improving the nutritional status as well as the quality of life of the rural community.

After meeting the consumption requirements of the village community, the remaining produce would be marketed in other rural areas.

4.3.v Encouraging consumption

In order to improve the nutritional status of the targeted community, emphasis should be given on encouraging consumption of the product by the target groups. This is important for breaking the inter-generational cycle of malnutrition and ill health. Improving the nutritional status of the village community should be the highest priority. If the entire produce is marketed, there will be no change in the nutritional status of the community. Special emphasis should be given to encourage the consumption of energy foods, especially by children, adolescent girls and pregnant and lactating women.

4.3.vi Rural Marketing

Providing energy foods to the target population is the major component of the project. This includes setting up of well equipped units for production, as well as marketing and distribution of energy foods in rural areas to meet the nutritional requirements of the community, especially infants, adolescent girls and women. For this purpose training will be given to volunteers and SHGs members who would take a lead in the production, distribution and marketing of energy foods so as to provide income generation. The units will be managed by the NGO only for the first one year, after which the SHGs would decide upon the ownership, with hand holding from the NGO. Working Capital will be provided for the first 6 months, during which time the NGO will develop marketing linkages for sale of the product in rural markets, and make the production units self sustaining.

4.3.vii Monitoring and evaluation

Monitoring and evaluation systems would be put in place to ensure that the project is routinely monitored. There will also be concurrent monitoring of the project. Each stakeholder of the scheme should understand the required parameters for effective implementation of the projects. The NGOs would fill the formats made available to them in order to monitor the progress in physical and financial terms.

Evaluation of the project would be done by a reputed external agency so that outcomes are measured independently.

4.3.viii Expected outcomes of the project

- Combating malnutrition in the community
- Improved awareness in the community about the inter-generational, life cycle of malnutrition and ill health and its control

- Demonstrable behavioral changes in nutritional practices/diet in the community
- Strengthening of local People's Organizations, especially the SHGs
- Demonstrable action by the community in addressing malnutrition and related issues
- Functional Production Units of Energy Foods and effective distribution, consumption and marketing
- Additional income generation in the SHG families
- Creation of a cadre of village volunteers for sustainability as well as replicability of the programme to other rural areas
- Strengthened linkages with various Governmental agencies as well as local NGOs/ CBOs

4.3.ix Suggested Costing of Project for 1 Year

BUDGET	Amount (Rs)
Community Organization	
Baseline survey @ Rs. 5000 per village for 15 villages	75,000
Awareness Generation @ Rs. 2000 per village for 50 villages	1,00,000
Capacity Building & Training	
Capacity Building & Training to the 300 representatives of the SHGs from 50 villages	2,00,000
Technical Consultant support for processing unit	20,000
Nutrition & Income Generation Activity	
Establishment of food processing unit at 10 centres @ Rs 1,00,000 per centre (Milling, Mixing Machine, Drier and allied equipments like sealing machine, gas stove, weighing machines, utensils, furniture & fixtures)	10,00,000
Marketing Campaigns	50,000
Service Support @ Rs.1000 per village	50,000
Technical consultant support for SHG Federation	20,000
Facilitation cum evaluation	50,000
Sub Total	**15,65,000**
Administrative cost (10% of programme cost)	1,56,500
Travel allowance @ Rs. 5000 per month	60,000
Procuring 5 bicycles for field workers @ Rs 1500 per bicycle	7500
Grand Total	**17,89,000**

Working Capital Requirement for 6 months: Calculation for Working Capital

1. Per day requirement of Nagali Malt per child = 50 gm
2. Cost of Production of 1 kg of Nagali Malt = Rs.24/-
3. Cost of Production of 50 gm of Nagali Malt = Rs.1.2/-
4. Working Capital Requirement per day = Rs. 1.2 X Total number of children
5. Working Capital Requirement per month = Rs. 1.2 X Total number of children X 30
6. Per day requirement of Enriched Mix for adolescent girls = 100 gm
7. Per day requirement of Enriched Mix for pregnant women = 100 gm
8. Per day requirement of Enriched Mix for lactating women = 100 gm
9. Per day requirement (5 + 6 + 7) = 300gm
10. Cost of production of 1 kg of Enriched Mix = Rs.24/-
11. Cost of production of 300 gm of Enriched Mix = Rs.7.2/-
12. Working Capital Requirement per day = Rs.7.2 X Total number of adolescent girls, pregnant women and lactating mothers
13. Working Capital Requirement per month= Rs.7.2 X Total number of adolescent girls, pregnant women and lactating mothers X 30
14. Total Working capital (5 + 13) for 6 months = Rs. 8.4 X Total number of beneficiaries X 30 X 6

Annexure 3

Name of Recipe: Ragi Malt
Weaning food for infants and Young children (0-6 years)

1) Ragi Malt **Flow Chart**

Take Ragi (70gm) + Wheat (15gm) + Green Gram (15gm)

↓

Soak them for 12 to 16 hrs.

↓

Germinate finger millet & wheat for 48 hrs & green gram for 24 hrs.

↓

Dry at 60.C

↓

Clean & roast the germinated cereals

↓

Condition the finger millet with 5% water

↓

Temper for 10 minutes

↓

Mill Ragi, Green gram & Wheat separately

↓

Sieve finger millet flour using 60 mesh sieve & wheat & gram flour separately

↓

Mix all the three flours & store in an airtight container
Mix with clean water or milk, and sugar for feeding the infant
Portion Size for Infants and Children: 50gms.

Name of Recipe: Ragi Malt
Weaning food for infants and young children
Nutritive Value of Ragi Malt (100 g)

No.	Ingredient	Nutritive value
1	Protein(g)	10.48
2	Energy (kcal)	331.00
3	Calcium (mg)	250.00
4	Phosphorous (mg)	300.00
5	Iron(mg)	4.13
6	Beta carotene (mg)	53.10
7	Thiamine (mg)	0.433
8	Riboflavin (mg)	0.200
9	Niacin (mg)	1.91
10	Folic Acid (mg)	18.30

Annexure 4

Name of Recipe: Enriched Mix
Enriched Mix for Adolescents, Pregnant and Lactating Women

Ingredients

Ragi———75 gms

Defatted Soya———20 gms

Peanuts

Jaggery

Flow Chart

Mill Ragi to flour

Mix Ragi flour, defatted Soya, Peanut & Jaggery

Pack & Seal

Mix with clean water or milk, and sugar
Portion Size for Adolescent Girls, Pregnant and Lactating Women: 100gms.

Nutritive Value of Enriched Mix (100 g)

No.	Ingredient	Nutritive value
1	Protein(g)	17.00
2	Energy (kcal)	330.00
3	Calcium (mg)	410.50
4	Phosphorous (mg)	235.40
5	Iron(mg)	6.00
6	Beta carotene (mg)	1161.00
7	Thiamine (mg)	0.472
8	Riboflavin (mg)	0.511
9	Niacin (mg)	1.783
10	Folic Acid (mg)	46.700

Annexure 5

Grades of Malnutrition

The following criteria are commonly used for determining grades of malnutrition in children aged 0-5 years, based on their weight for age (Gomez Classification):

Grade I Malnutrition/ Mild Malnutrition: Weight for age is between 75 to 89.9% of the National Centre for Health Statistics (NCHS) reference median.

Grade II Malnutrition/ Moderate Malnutrition: Weight for age is between 60-74.9% of the NCHS reference median

Grade III Malnutrition/ Severe Malnutrition: Weight for age is less than 60% of the NCHS reference median.

The NCHS Reference Height and Weight for boys and girls in the age group of 1-6 years is as follows:

Age(Years)	Boys		Girls	
	Height(cm)	Weight(kg)	Height (cm)	Weight(kg)
1.0	76.1	10.2	75.0	9.5
1.5	82.4	11.5	80.9	10.8
2.0	85.6	12.3	84.5	11.8
2.5	90.4	13.5	89.5	13.0
3.0	99.1	15.7	93.9	14.1
3.5	99.1	15.7	97.9	15.1
4.0	102.9	16.7	101.6	16.0
4.5	106.6	17.7	105.1	16.8
5.0	109.9	18.7	108.4	17.7
6.0	116.1	20.7	114.6	19.5

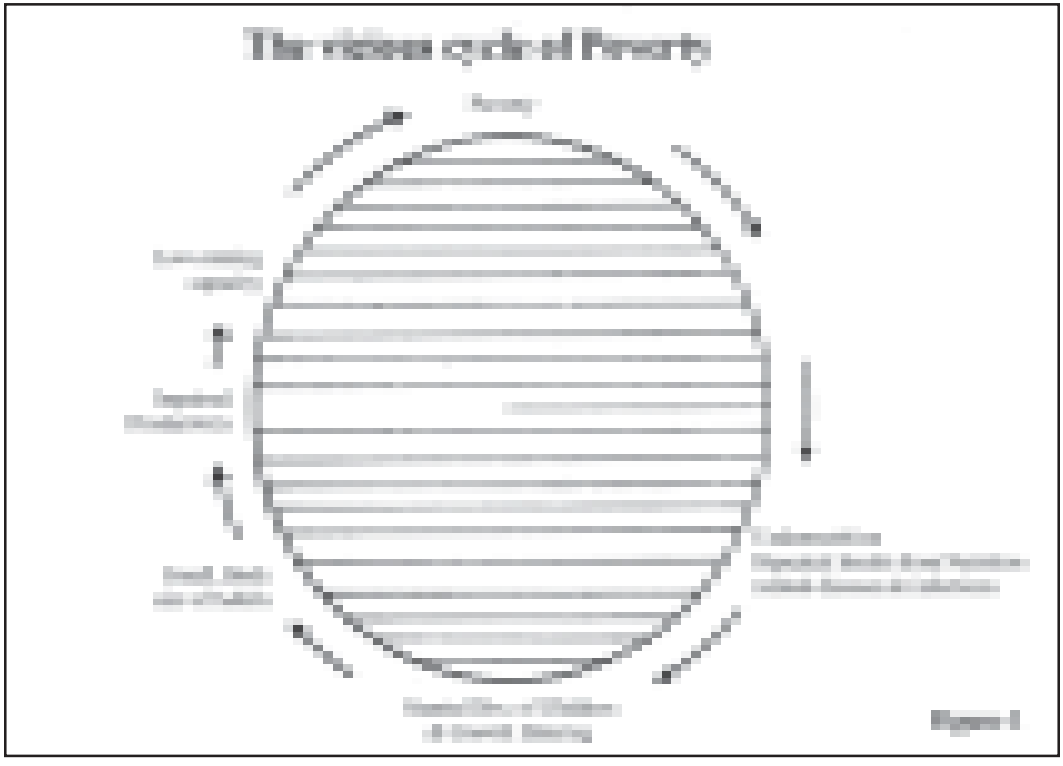
The standard developed by NCHS of USA, is based on growth measurements of a large number of American children. As per the recommendations of the WHO Expert Working Group (1975) on use of anthropometric indicators of nutritional status, the NCHS data are suited for use as an international reference, and may be internationally applicable for children up to 10 years of age.

Annexure 6

National Nutrition Policy 1993

I. Introduction

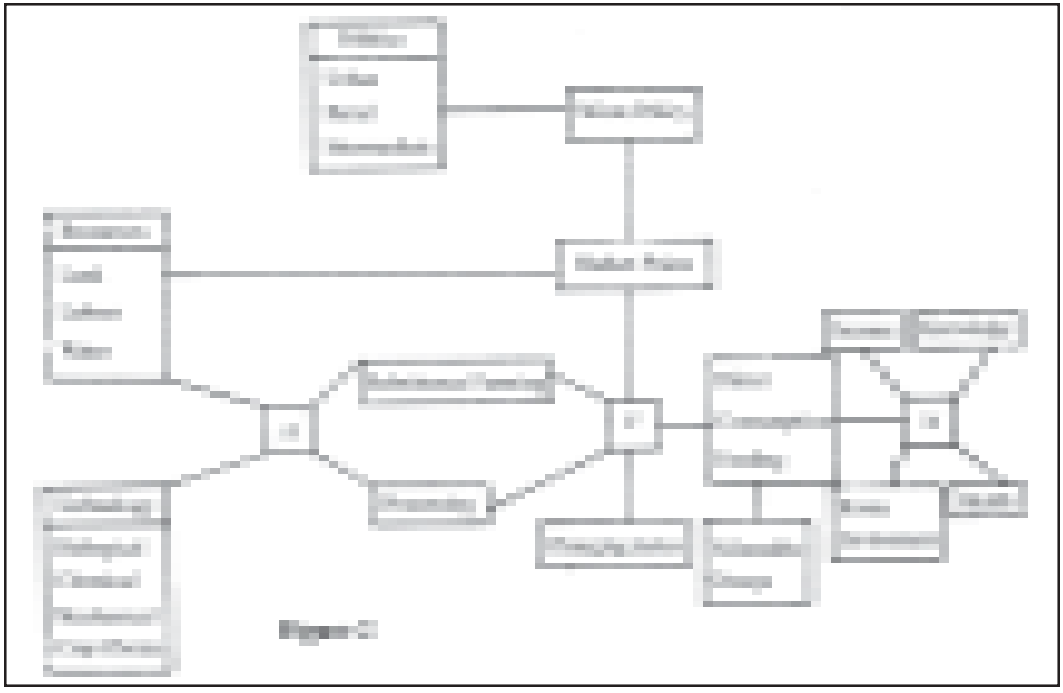
Widespread poverty resulting in chronic and persistent hunger is the single biggest source of the developing world today. The physical expression of this continuously re-enacted tragedy is the condition of under-nutrition which manifests itself among large sections of the poor, particularly amongst the women and children. Under nutrition is a condition resulting from inadequate intake of food or more essential nutrient(s) resulting in deterioration of physical growth and health. The inadequacy is relative to the food and nutrients needed to maintain good health, provide for growth and allow a choice of physical activity levels, including work levels, that are socially necessary. This condition of under-nutrition, therefore, reduces work capacity and productivity amongst adults and enhances mortality and morbidity amongst children. Such reduced productivity translates into reduced earning capacity, leading to further poverty, and the vicious cycle goes on (figure 1 below).



The nutritional status of a population is therefore critical to the development and well being of a nation.

II. Need for a Nutrition Policy within the Development Context:

The need for a National Nutrition Policy is implicit in both the paramountcy of nutrition in development as well as in the complexity of the problem. This general problem of under-nutrition should be seen as a part of a larger set of processes that produces and consumes agricultural commodities on farms, transforms them into food in the marketing sector and sells the food to customers to satisfy nutritional, aesthetic and social needs. Within this set, there are three sub-sets of issues, with the broad sectors of agriculture, food and nutrition, with various linkages among them. In fact, the third subset, viz, Nutrition, is the net result of the other two subsets (figure 2 below).



It is both possible as well as necessary to devise policy interventions for influencing the working of these sets and thereby improving the nutritional status of the society. The nature of linkages determine the fate of such interventions. The diagram above gives the various linkages of these three sub-systems, determining the nutrition status of a society, and it underscores the complex and multi-dimensional nature of the problem of nutrition. For instance, post independence India has a proud record of achievement in food production.

From being a deficit nation, depending on food imports in the sixties, to having become surplus in foodgrains in the eighties, is a saga of concerted agricultural research, extension work and development, resulting in a dramatic productivity increase. And yet, from all accounts, endemic malnutrition and ill health resulting from malnutrition continue to stalk the country. It is this stark reality that underscores the need for a nutrition policy. Increased food production does not by itself necessarily ensure nutrition for all. According to the 1978-88 round of NSS, nearly 29.2% of India's population is estimated to be below the defined poverty line. While, at the macro-level, this group constitutes the nutritionally at risk population, even within this group the women and the children represent nutritionally the most fragile and vulnerable sections. This is the result of intra-household gender discrimination, which perpetuates the age old inequities. All this emphasis the complexity of the problem and the need for tackling the Nutrition Policy consciously and at several levels simultaneously. More economic development, or even the adequacy of food at household levels, are no guarantees for a stable and satisfactory nutritional status. At the same time, however, the overall development strategy of a country is likely to have a pronounced bearing on what nutritional planning can accomplish. Therefore, the task is not merely in terms of formulating a nutrition policy but also in terms of locating and grounding it in the overall development strategy of the country. Nutrition has to be tackled independently, alongwith other development issues. This is not all. The time dimension is also important. A Policy having a mere long term effect, even if beneficial for the nutritionally at risk population, would not suffice. After all, this group has too little to live on in the long run and has too much to die of in the short run. Therefore, both short as well as long term strategies are called for, comprising both direct as well as indirect interventions.

III. The Nutrition Status of India:

(A) The Aggregate Position Regarding Intake:

(1) Calorie & Protein Intake:-There has been a steady increase in aggregate consumption of calories at household level. During 1957-79, in urban areas, the aggregate intake levels of protein were above the ICMR recommended level for all income groups except slum dwellers. Even in rural areas, between 1975 and 1989, aggregate consumption levels of all groups taken together were higher than the recommended levels. In fact, time trends show that the average intake of calories at the lowest income group had a definite increasing trend during the seventies.

However, there has not been a commensurate increase in consumption of proteins and protected foods like fats and oils. Dietary patterns have also remained largely unchanged despite increase in calorie consumption. The bulk of calorie intake increase in ascribed to the intake of cereals. Some disaggregate data regarding rural areas show the vulnerability

of the landless agricultural labour families even as late as in 1979 when the Green Revolution was well under way. Drought years have witnessed marginal decreases in the aggregate consumption of proteins and high energy foods.

(2) Micro-nutrient Intake:-During 1975-79, in urban areas, aggregate intake levels of Iron were above the ICMR recommended levels for all groups. For Vitamin "A", however, deficiencies existed among all groups except the High Income Groups.

(B) The Dis-aggregated Picture

Although, the NNMB reports regarding average household food consumption levels do not point to any significant intake shortfall except for Vit. "A", these average figurers actually mask the real picture. According to a NNMB-NSSO Survey, even at an aggregate level in terms of monthly household income, around 34% of household earn considerably less than the average food expenditure of the sampled families (Figure 3: NNMB 1983-84 below)

Figure 3. NNMB-NSSO Survey Data

NNMB-NSSO Survey Report*	Rs.73-80
'Average' per caput food expenditure/mensem	(60%-70% of total Expenditure)
NNMB Survey (1988)**	<Rs.60
Household per caput/mensem	(in 34% of households)

Source: *NNMB (1983-84)—p.6 **NNMB Interim Report of Repeat Survey (1988-89)

Thus, even though there has been a drop in the population below poverty line since 1960 (from 56.8% to 29.2% in 1987-88) in terms of numbers, a staggering 250 million people suffer from varying degrees of malnutrition in India. There is, however, no doubt that the impressive gains of the Green Revolution in terms of national food security and effective early warning systems have eradicated famines and situations of extreme hunger and starvation. What still remain are different degrees of chronic and endemic hunger which, in the context of prevailing patterns of intra-household food distribution particularly in rural families, translate into a grave danger for the nutrition status of women and children. This is the crux of the nutrition situation in India.

The major nutrition problems of India can be classified as follows:

(1) Under-nutrition resulting in:
(a) Protein Energy Malnutrition (PEM);
(b) Iron deficiency;
(c) Iodine deficiency

(d) Vitamin "A" deficiency
(e) Low Birth Weight Children;

(2) Seasonal Dimensions of Nutrition;

(3) Natural Calamities & the landless

(4) Market Distortion and Disinformation;

(5) Urbanisation

(6) Special Nutritional Problems of Hill People, Industrial Workers, Migrant Workers, and other special categories.

(7) Problems of Over nutrition, overweight and obesity for a small section of urban population. For India and much of the Third World nutrition status is characterized by varying degrees of undernutrition for women and children.

(1)(a) **PEM**: Protein Energy Malnutrition is the most widespread form of malnutrition among pre-school children of our country. A majority of them suffer from varying grades of malnutrition. As many as 43.8* percent children suffer from moderate degrees of PEM and 8.7* percent suffer from severe extreme forms of malnutrition. Surveys conducted between 1975 and 1990 indicated that the percentage of normal children (for both the sexes pooled) has increased from 5.9% to 9.9% while the moderate form of malnutrition declined from 47.5% to 43.8%. The percentage of severely malnourished children declined from 15% to 8.7%. The child population of urban slums had the lowest proportion of children with normal body weight and recorded the highest proportion of severely malnourished children. Between 1975 and 1990, increase in the percentage of normal children was appreciable in all the States, except Karnataka and Orissa, where the increase was marginal. The percentage of severely malnourished children in the States of Gujarat and Madhya Pradesh failed to show any marked upward trend.

* NNMB, NIN

(b) Iron Deficiency: Nutritional Anaemia: Nutritional anaemia among the pre-school children and expectant and nursing mothers is one of the major preventable health problems in India. It has been estimated in various studies particularly those conducted by NIN that roughly 56 percent pre-school and almost 50 percent of the expectant mothers in the third trimester of pregnancy suffer from iron deficiency, which is basically due to inadequate or poor absorption of iron from a predominantly cereals-based diet. Low iron intake, coupled with hookworm infestation and infections, further aggravates the problem. According to NNMB Report of repeat surveys (1989-90), between 1975 and 1990, a marginal decline of 1.8 mg/cu was observed

in the mean Iron intake at an over all level. During 1989-90, the intakes were above the RDI levels in only Karnataka, Maharashtra, Gujarat and Madhya Pradesh.

(c) Iodine Deficiency Disorders : In India, nearly 40 million persons are estimated to be suffering from goiter and 145 million are living in the known goiter endemic regions. The prevalence of goiter in these endemic regions ranges from 1.5 per cent in Assam (Cachar Distt.) to 68.6% in Mizoram. It is also estimated that 2.2 million children are afflicted with cretinism and about 6.6 million are mildly retarded and suffer from varied degrees of motor handicaps. It is estimated that iodine deficiency also accounts for 90,000 still births and neo-natal deaths every year.

d) Vitamin 'A' Deficiency: Nutritional blindness which affects over seven million children in India per year results mainly from the deficiency of Vitamin A, coupled with protein energy malnutrition. In its severest form, it often results in loss of vision and it has been estimated that around 60,000 children become blind every year (Source: NIPCCD: Situational Analysis of Children: March 1989: p42). Vitamin A deficiency is assessed on the basis of conjuctival xerosis and Bitot's spot. A study of NNMB has indicated that, while there were no manifestations of Vitamin A deficiency in infants, its prevalence increased with age. Further, a higher prevalence was seen in school age children in all the income groups. In the urban areas it was the highest among slum children (7.8%), followed by industrial labour (6.3%), the middle income group (4.7%) and the low income group (4.1%). According to NNMB (1990), in none of the States was the average intake comparable to the recommended level.

(e) Prevalence of Low Birth Weight Children: The prevalence of low birth weight children is still unacceptably high for India. The nutritional status of infants is closely related to the maternal nutritional status during pregnancy and infancy. In India, 30% of all the infants born are low birth weight babies (weight less than 2500 gms.) and this pattern is almost constant since 1979. An ICMR study reported that the average birth weight ranged between 2.5 and 2 kg. and the prevalence of low birth weight ranged between 26 and 57 percent in the urban slums and 35 to 41 per cent in the rural communities. This is a matter of concern since 90 per cent of the deaths occur among infants with birth weight below 2000 gms. Low birth weight was found to be connected with several factors such as age of the mother, maternal weight, weight gain during pregnancy, inter-pregnancy interval, haemoglobin less than 8 gms. per cent and maternal illiteracy.

Keeping in view the fact that birth weight is the most important determinant of child survival and that the maternal nutritional status is the most decisive factor in preventing low birth weight, the National Health Policy has set a goal of bringing down the incidence of low birth weight by 10 per cent and the present maternal

mortality rate from existing rate of 4 per 1000 to 2 per 1000 live births by 2000 A.D. It was found by the NNMB in 1989 that, in the State of Karnataka, consumption of energy by women was the highest ie, 2992 k calories, as compared to that of other States viz. West Bengal (2589k calories) and Orissa (2468k Calories). In the rest of the States, the consumption of calories was less than the recommended 2400k calories.

Women face high risks of malnutrition and disease at all the three critical stages, viz. infancy and childhood, adolescence and reproductive phase. Child mortality rate figures show high rates for female children than their male counterparts. This is perhaps indicative of social prejudices leading to neglect of female babies.

When girls attain adolescence, they go through a second spurt of growth and their bodies grow much more rapidly to prepare them for child bearing. But, unfortunately, the intake of nutrients during this period is significantly low, the calories and protein gaps ranging from 300-400 calories and 2-22 gms. of protein respectively. It is seen that the daily intake of Vitamin "A" by all age groups, including child, adolescent and adult population, is very much lower than the recommended level. The intake of iron is also lower than the recommended level in children of all age groups, adolescent girls and adult women.

(2) Seasonal Dimensions:-In the duality of the Indian situation, where high-yielding modern agriculture co-exists with rain-fed subsistence farming, there are serious seasonal dimensions of the nutrition question. In large parts of India, the rainy months are the worst months for the rural, landless poor. This is when cultivation, deweeding, ploughing and other works demand maximum energy from them, while food stocks at home dwindle and market prices rise. These are again the months when water-borne diseases are so frequent. This condition goes on aggravating till late October or even November. These are the months of rural indebtedness and compulsive market involvement of the landless and the small/marginal cultivators. When the first kharif harvest arrives, the situation is no better with widespread distress sales by the small/marginal farmers. All these make nutrition a casualty during this period. Seasonality of employment in subsistence agriculture affects nutrition through the double jeopardy of high energy demand of peak work seasons and fluctuation in household level food availability, which tend to exacerbate differential food intake among men, women and children. As a result, in very poor households, women and children may actually fall below the survival line during lean periods.

(3) Natural calamities & Nutrition: This same group of rural landless poor is most vulnerable to droughts, floods and famines. As has been established in famine periods, worst affected groups are the landless agricultural labourers, artisans, craftsmen and non-agricultural labourers in that order.

(4) Market distortion & Disinformation: A striking feature which has now been established is that the famines are caused not so much by any real decline in food availability as by a sudden erosion of purchasing power of these marginal groups who compulsively depend on the market (landless labourers etc.). In fact lessons from all over the world have proved that it is not any substantial food shortage, but the psychosis of food shortage and the widespread belief regarding crop failure, that triggers off price rise spirals resulting in major malnutrition situations.

(5) Urbanisation: Under-nutrition in urban areas is a major area of concern. Studies by NNMB have actually shown that the nutritional status of urban slum dwellers in India is almost as bad as that of rural poor. This is borne out both by figures relating to intake of food as well as intake of nutrients. The deleterious effects of rural urban movements on nutrition, in much of the third world, is quite well known. The children of urban slum dwellers and of the urban informal sector are nutritionally the most fragile of all groups. Uncertainty of income and the absence of informal nutritional support systems within society, so common to rural areas of India, place many of these families on the very edge of survival. The fallout of a spreading urban culture, which encourages diversion of a high proportion of family expenditure to luxury goods & entertainment, aggravates the situation. Poor sanitary conditions, acute respiratory infections and communicable diseases characterize these urban settlements.

(6) There are some regional and occupational specificities of the problems of nutrition. The nutritional imbalance of hill people engaged in very strenuous labour, the special nutritional problems of some categories of Industrial Workers and migrant workmen are other examples which need a detailed and specific response.

(7) With the burgeoning size of Indian middle class, overnutrition with attendants of cardio vascular problems and other health hazards are affecting large number of people particularly in the cities.

IV. The Existing Policy Instruments for combating Malnutrition:-

Till the end of the IV Plan, India's main emphasis was on the aggregate growth of the economy and reliance was placed on the percolation effects of growth. In the face of continuing poverty and malnutrition, an alternative strategy of development, comprising a frontal attack on poverty, unemployment and malnutrition, became a national priority from the beginning of the V Plan. This shift in strategy has given rise to a number of interventions to increase the purchasing power of the poor, to improve the provision of basic services to the poor and to devise a security system through which the most vulnerable sections of the poor (viz. women and children) can be protected.

V. Nutrition Policy Instruments:

The Strategy: Nutrition is a multi-sectoral issue and needs to be tackled at various levels. Nutrition affects development as much as development affects nutrition. It is, therefore, important to tackle the problem of nutrition both through direct nutrition intervention for specially vulnerable groups as well as through various development policy instruments which will create conditions for improved nutrition.

A. Direct Intervention – Short Term

(i) Nutrition Intervention for especially vulnerable groups:

(a) Expanding the Safety Net: The Universal Immunization Programme, Oral Rehydration Therapy and the Integrated Child Development Services (ICDS) have had a considerable impact on child survival (IMR for 1989 stood at 91 per 1000) and extreme forms of malnutrition. The position, however, is that the silent form of hunger and malnutrition continues with over 43.8% (1988-90)* children suffering from moderate malnutrition and about 37.6% (1988-90)* from mild malnutrition. Therefore, while more children are surviving today, an overwhelmingly large number of them are destined to remain much below their genetic potential. This is the enormity of the demographic trap which faces us as we move towards the next century. There is, therefore, an immediately imperative to substantially expand the Nutrition Intervention net through ICDS so as to cover all vulnerable children in the age group 0-6 years. Presently, India's child population for 0-6 years is around 18% of the total population and, out of this, 30.76 million comprise the children from the households living below the poverty line in rural areas. Presently ICDS covers around 15.3 million children (most of them in the rural areas). It should be over conscious policy to, cover the remaining 15.46 million children, who are nutritionally at risk, by extending ICDS to all the remaining 2388 blocks (5153 minus 2765 blocks existing) of the country by the year 2000.

* *Source:* Nutrition News Vol.12 No. 3 May 1991 (NIN)

(b) With the objective of reducing the incidence of severe and moderate malnutrition by half by the year 2000 A.D. a concerted effort needs to be made to trigger appropriate behavioural changes among the mothers. Improving growth monitoring between the age group 0 to 3 years in particular, with closer involvement of the mothers, is a key intervention. Presently, growth monitoring has become a one-way process and the mothers are mere passive observers of the entire process. This needs to be changed because, after all, nutrition management of the children will have to be done by the mothers at home. Getting involved in the growth monitoring of her child will give her a feeling of control over the child's nutrition process and, combined with adequate nutrition and health education, empower her to manage the nutrition needs of her children effectively.

(c) Reaching the Adolescent Girls:- The Government's recent initiative of including the adolescent girl within the ambit of ICDS should be intensified so that they are made ready for a safe motherhood, their nutritional status (including iron supplementation in the body) is improved and they are given some skill upgradation training in home-based skills and covered by non-formal education, particularly nutrition and health education, All adolescent girls from poor families should be covered through the ICDS by 2000 A.D. in all CD blocks of the country and 50% of urban slums.

(d) Ensuring better coverage of expectant women: In order to achieve a target of 10% incidence of low birth weight by 2000 A.D., such coverage should include supplementary nutrition right from 1st trimester and should continue during the major period of lactation, at least for the first one year after pregnancy.

(ii) Fortification of Essential Foods:- Essential food items shall be fortified with appropriate nutrients, for example, salt with iodine and/or iron. However, given the highly extensive and decentralized process of salt marketing in the country, there is the need to identify a vehicle, which can be better controlled. Research in iron fortification of rice and other cereals should be intensified. The distribution of iodised salt should cover all the population in endemic areas of the country to reduce the iodine deficiency to below endemic levels.

(iii) Population of Low Cost Nutritious Foods: Efforts to produce and popularise low cost nutritious foods from indigenous and locally available raw materials shall be intensified. It is Necessary to involve women particularly in this activity.

(iv) Control of Micro-Nutrient Deficiencies amongst vulnerable Groups:- Deficiencies of Vitamin "A", iron and folic acid and iodine among children, pregnant women and nursing mothers shall be controlled through intensified programmes. Iron supplementation to adolescent girls shall be introduced. The programme shall be expanded to cover all eligible members of the community. The prophylaxis programme, at present, do not cover all children. For example, the Vitamin "A" programme covers only 30 out of about 80 million. It is necessary to intensify all these efforts and work on a specific time frame. Nutritional blindness should be completely eradicated by the year 2000 A.D. The National Nutritional Anaemia Prophylaxis Programme should be extended and strengthened to reduce anaemia in expectant women to 25% by 2000 A.D.

B. Indirect Policy Instruments: Long Term Institutional & Structural Changes:-

(i) Food Security: In order to ensure aggregate food security, a per capita availability of 215 kg/person/year of foodgrains needs to be attained. This requires production of 250 million tonnes of foodgrains per year by 2000 A.D. and buffer stocks of 30-35 million tonnes in order to guard against exigencies, such as flood and droughts. However, taking into account the present trends and the possibility of improved availability of non-cereal

food items, there should be a target of at least attaining 230 Million tonnes foodgrains production by 2000 A.D.

(ii) Improvement of Dietary Pattern through Production and Demonstration: Improving the dietary pattern by promoting the production and increasing the per capita availability of nutritionally rich foods. The production of pulses, oilseeds and other food crops will be increased with a view to attaining self-sufficiency and building surplus and buffer stocks. The production of protective food crops, such as vegetables, fruits, milk, meat, fish and poultry, shall be augmented. Preference shall be given to growing foods, such as millets, legumes, vegetables and fruits (carrots, green leafy vegetables, guava, papaya and amla). For this purpose, the latest and improved techniques shall be increasingly applied, high-yielding varieties of food crops developed and extensively cultivated, adequate extension services made available to farmers, wastage of food in transit and storage reduced to the minimum, available food conserved and effectively utilized and adequate buffer stocks built up. Certain imbalances and anomalies in our agricultural policy need to be redressed immediately. Our Agricultural Policy has been hitherto concerned with production exclusively and not nutrition, which is the ultimate end. While the Green Revolution has largely remained a cereal revolution, with bias towards wheat, coarse grains and pulses, which constitute the poor man's staple & protein requirements, have not received adequate attention. The prices of pulses, which were below cereal prices before the Green Revolution, are now almost double the price of cereals. Our Food Policy should be consistent with our national nutritional needs and this calls for the introduction of appropriate incentives, pricing and taxation policies.

(iii) Policies for Effecting Income Transfers so as to improve the entitlement package of the rural and urban poor.

(a) Improving the purchasing power: Poverty alleviation programmes, like the Integrated Rural Development Programme (IRDP) and employment generation schemes like Jawahar Rozgar Yojana, Nehru Rozgar Yojana and DWCRA are to be re-oriented and restructured to make a forceful dent on the purchasing power of the lowest economic segments of the population. In all poverty alleviation programmes, nutritional objectives shall be incorporated explicitly and the nutritional benefits of income generation shall be taken for granted. Existing programmes shall be scrutinized for their nutrition component. It is necessary to improve the purchasing power of the landless and the rural and urban poor by implementing employment generation programmes so that additional employment of at least 100 days is created for each rural landless family and employment opportunities are created in urban areas for slum dwellers and the urban poor.

(b) Public Distribution System: Ensuring an equitable food distribution, through the expansion of the public distribution system. The public distribution system shall ensure availability of essential food articles, such as coarse grains, pulses and jaggery, besides

rice, wheat, sugar and oil; conveniently and at reasonable prices to the public, particularly to those living below the poverty line, not only in urban areas but throughout the country. For this purpose, encouragement shall be given to the consumers cooperative and fair price shops shall be opened in adequate number in all areas. Effective price and quality control shall be exercised over the cooked foods in restaurants and other eating places.

The Public Distribution System should be strengthened especially during the monsoon months for giving special rations at specially subsidized rates for at least four months (July–October) to the seasonally "at risk" population. The beneficiaries of this programme should include landless labourers and their families and the migrant labourers and their families.

(iv) Land Reforms: Implementing land reform measures so that the vulnerability of the landless and the landed poor could be reduced. This will include both tenural reforms as well as implementation of ceiling laws.

(v) Health & Family Welfare: The health and family welfare programmes are an inseparable part of the strategy. Through "Health for All by 2000 AD" programme, increased health and immunization facilities shall be provided to all. Improved pre-natal and post-natal care to ensure safe motherhood shall be made accessible to all women. The population in the reproductive age group shall be empowered, through education, to be responsible for their own family size. Through intensive family welfare and motivational measures; small family norm and adequate spacing shall be encouraged so that the food available to the family is sufficient for proper nutrition of the members.

(vi) Basic Health and Nutrition Knowledge: Basic health and nutrition knowledge, with special focus on wholesome infant feeding practices, shall be imparted to the people extensively and effectively. Nutrition and health education concepts shall be effectively integrated into the school curricula, as well as into all nutrition programmes. Nutrition and Health Education are very important in the context of the problems of overnutrition also.

(**vii) Prevention of Food Adulteration:** Prevention of food adulteration must be strengthened by gearing up the enforcement machinery.

(viii) Nutrition Surveillance: Nutrition surveillance is another weak area requiring immediate attention. The NNMB/NIN of ICMR needs to be strengthened so that periodical monitoring of the nutritional status of children, adolescent girls, and pregnant and lactating mothers below the poverty line takes place through representative samples and results are transmitted to all agencies concerned. The NNMB should not only try and assess the impact of ongoing nutrition and development programmes but also serve as an Early Warning System for initiating prompt action.

Since the Department of Women and Child Development is the nodal Department for National Nutrition Policy, it is necessary for the NNMB to be accountable to this Department in so far as Nutrition Surveillance is concerned.

(ix) Monitoring of Nutrition Programmes: Monitoring of Nutrition Programmes (viz ICDS), and of Nutrition Education and Demonstration by the Food and Nutrition Board, through all its 43 field units, should be continued. The transfer of Food and Nutrition Board to the Department of Women and Child Development has already been approved by the Prime Minister. This will ensure an integrated set up to deal with the problem of nutrition with adequate technical & field level set up.

(x) Research: Research into various aspects of nutrition, both on the consumption side as well as the supply side, is another essential aspect of the strategy. Research must accurately identify those who are suffering from various degrees of malnutrition. Research should enable selection of new varieties of food with high nutrition value which can be within the purchasing power of the poor.

(xi) Equal Remuneration: Special efforts should be made to improve the effectiveness of programmes related to women. The wages of women shall be at par with that of men in order to improve women's economic status. This requires a stricter enforcement of the Equal Remuneration Act. Special emphasis will have to be given for expanding employment opportunities for women.

(xii) Communication: Communication through established media is one of the most important strategies to be adopted for the effective implementation of the Nutrition Policy. The Department of Women and Child Development will have a well-established, permanent Communications Division, with adequate staff and fund support. While using the communication tools, both mass communication as well as group or inter-personal communication should be used. Not only the electronic media but also folk and print media should be used extensively. The existing facilities in the Song and Drama Division and the Directorate of Advertising and Visual Publicity (DAVP) in the Ministry of Information and Broadcasting could help in a big way to improve nutrition and health education. To give a new direction to communication and media, efforts will be made for promoting sound feeding practices, which are culturally acceptable and based on local food habits. Alongside the information gap, existing social attitudes and prejudices, inherent in our milieu, which discriminate against girls and women and affect their health and nutrition, need to be countered through educational programmes. Further, the media policy shall focus on ways and means to combat malnutrition among girl children, adolescent girls and women in the reproductive age group. Educational programmes will be made meaningful and interesting to meet the growing needs of the population.

The role of information is crucial for nutrition. Such information is not only important with regard to improved health and nutrition practices but can also have a vital influence on the market, particularly during natural calamities, war etc. The role of information during such exigencies is to ensure that the market remain stable without any panic being created. This also needs to be carefully monitored.

(xiii) Minimum Wage Administration: Closely related to the market, is the need to ensure an effective, minimum wage administration to ensure its strict enforcement and timely revision and linking it with price rise through a suitable nutrition formula. A special legislation should be introduced for providing agricultural women labourers the minimum support, and atleast 60 days leave by the employer in the last trimester of her pregnancy. Excessive loss of energy during the working seasons has serious nutritional implications. The legislation should take care of this problem also.

(xiv) Community Participation: The active involvement of the community is essential not only in terms of being aware of the services available to the community but also for deriving the maximum benefit from such services by giving timely feedback necessary at all levels. After all, communication must form an essential part of all services and people themselves are the best communicators.

Community participation will include:

(a) Generating awareness among the community regarding the National Nutrition Policy and its major concerns;

(b) Involving the community through their Panchayats or, where Panchayat do not exist, through beneficiary committees in the management of nutrition programmes and interventions related to nutrition, such as employment generation, land reforms, health, education etc.,

(c) Actual participation, particularly of women, in food, production and processing activities,

(d) Promoting schemes relating to kitchen gardens, food preservation, preparation of weaning foods and other food processing units, both at the home level as well as the community levels; and

(e) Generation of effective demand at the level of the community for all services relating to nutrition.

(xv) Education & Literacy: It has been shown that Education and Literacy particularly that of women, is a key determinant for better nutritional status. For instance, Kerala State which has the highest literacy level, also has the best nutrition status despite the fact that calorie intake in Kerala is not the highest among all States in the country.

(xvi) Improvement of the Status of Women: The most effective way to implement Nutrition with mainstream activities in Agriculture, Health, Education and Rural Development is to focus on improving the status of women, particularly the economic status. After all, women are the ultimate providers of nutrition to households both through acquisition of food as well as preparation of food for consumption. There is evidence that women's employment does beneficial household nutrition, both through increase in household

income as well as through an increase in women's status, autonomy and decision-making power. Moreover, female education also has a strong inverse relationship with IMR. Educated women have greater roles in household decision making, particularly those relating to nutrition and feeding practices.

Therefore emphasis on women's employment and education particularly nutrition and health education should provide the bedrock of the nation's nutritional intervention. If a self sustaining development model is to be pursued in which the community is able to manage its nutrition and health needs on its won, the socio-economic security of women *is sine qua non.*

This underscores the importance of improving the employment status of women. The groundswell of voluntary action created through the National Literacy Mission should be harnessed and channelised into the areas of child survival and nutrition.

VI. Administration and Monitoring

1. Implementation of National Nutrition Policy:

(a) The measures enumerated above have to be administered by several Ministries/ Departments of the Government of India and various governmental and non-governmental organisations. There should be a close collaboration between the Food Policy, the Agricultural Policy, the Health Policy, the Education Policy, the Rural Development Programme and the Nutrition Policy as each complements the other.

The NNP should immediately be translated into forceful, viable and realistic sectoral action programmes. Special working groups shall be constituted in the Departments of Agriculture, Rural Development, Health, Education, Food and Women and Child Development to analyse the nutritional relevance of sectoral proposals and to incorporate nutritional considerations in the light of the Nutrition Policy wherever necessary. Each concerned Central Ministry shall implement the measures for which it has direct or nodal responsibility.

(b) An Inter-Ministerial Co-ordination Committee will function in the Ministry of Human Resource Development under the Chairmanship of Secretary, Department of Women and Child Development, to oversee and review the implementation of nutrition intervention measures. Sectoral Ministries/Departments concerned, like Health and Family Welfare, Education and Agriculture, Food and Civil Supplies etc., will be represented on the Inter-Ministerial Co-ordination Committee. The Committee will meet once or twice a year. The Co-ordination Committee would be constituted with the sectoral representatives or administrators essential for decision making on policy matters. To analyse, discuss and resolve the technical issues and nutrition aspects of all plans and strategies during the

implementation stage, technical experts from concerned areas would be associate members.

(c) A National Nutrition Council will be constituted in the Planning Commission, with Prime Minister as President. Members will include concerned Union Ministers, a few State Ministers by rotation, and experts, and representatives of non-governmental organisations. The Council will be the national forum for policy coordination, review and direction at the national level. The Council will meet once a year. The National Nutrition Council will be the highest body for overseeing the implementation of the National Nutrition Policy through the various sectoral plans of action and will issue policy guidelines based on latest nutritional surveillance feedback.

2. Monitoring of Nutrition Situation: Nutritional Surveillance of the country's population especially children and mothers, shall be the responsibility of the National Institute of Nutrition/NNMB who in turn may involve the National Institute of Health and Family Welfare, Central Health Education Bureau, Home Science, Medical Colleges and NGOs. There shall be a mechanism to utilize the services of Food/Nutrition Science and Medical graduates trained every year, to manage the national nutrition programmes. NIN/NNMB should be accountable to the Department of Women and Child Development in so far as Nutrition Surveillance is concerned.

The paucity of reliable and comparable data from all parts of the country is a definite obstacle towards a realistic and disaggregated problem definition. This calls for a nation-wide monitoring system. To achieve this, it is necessary to restructure and strengthen the existing National Nutrition Monitoring Bureau (NNMB) and to develop a mechanism for generating nation-wide disaggregated data within a short period for use by the Centre and the States for taking corrective action wherever necessary. This would ensure a regular monitoring and surveillance system and develop a reliable data base in the country not only to assess the impact of on going nutrition and development programmes but also to serve as an early warning system for initiating prompt action.

3. Role of State Governments: In a federal polity like ours, the cutting edge of governmental interventions commences from the state level. Therefore, the successful actualization of Nutrition Policy is largely dependent on the effective role of the State Governments.

The formal structure at the State level should be similar to that envisaged under the Government of India. There should be an **Apex State Level Nutrition Council** to be chaired by the Chief Minister and to comprise concerned Minister of the State Government, representatives of leading NGOs working in the State, experts and representatives of related professional bodies. There should be an **Inter-Departmental Coordinating Committee** to function under the Chief Secretary which will coordinate, oversee and monitor the implementation of the National Nutrition Policy. The Committee would also

focus on the State level targets for the various nutrition related indicators based targets set under the NNP. The Secretary of the Department dealing with women and children should be the convener this Committee.

Special working groups will be set in the Departments of Agriculture, Rural Development, Health, Education, Food and Women and Child Development and this group will be responsible for vetting the various sectoral schemes from the point of view of nutrition before they are finalised.

4. Given the problem of mounting delivery cost of various nutrition interventions, it is necessary to mobilize resources from within the community in order to ensure sustainability of these interventions. This is a major area of concern and the State Governments, local bodies (including Municipal and Panchayat bodies); NGOs, cooperatives and professional organisations and pressure groups must take this up as a challenge. In a pluralistic society like ours, a concerted efforts by all of them is the only way to build community support and ultimately community participation in these schemes. Successful examples of the community contributing the nutrition component of ICDS Scheme exists in certain States. It is possible to replicate these examples. Many State Governments have started a major mid-day meal programme funded out of the State resources. The other State Governments/ Union Territory Admn. may also consider such as introduction in their primary and secondary schools. The private schools and schools which are capable of mobilizing their own resources may be encouraged to introduce such schemes out of their own resources.

The State Governments may consider constituting similar bodies, i.e., State Co-ordination Committees and State Nutrition Councils, as well as such bodies at the district levels.

In a massive country like India, with autonomous States, each with its characteristic problems, priorities, approaches and resources, the State level nutrition policies would be better able to deal with the problems. After the NNP of India is operationalised with specific objectives, plans of action, strategies, targets and time frame, development of state level policies shall be encouraged.