1. INTRODUCTION

Despite considerable progress in understanding the nature and cause of malnutrition, it continues to be a problem of staggering proportion through out the world (UN/ACC-SCN 1993). On the basis of weight-for-age relationship, 36% of preschool-aged children (from birth to 6 years of age) in developing countries are moderately or severely malnourished (Carlson and Wardlaw 1990).In addition, based on preliminary estimates of sixth world food survey, 20% of the population or approximately 1 billion people in developing countries are energy-deficient (FAO 1992). This is clearly an under estimate of the nutritional problem, since it is based solely on calorie deficits. If nutritional disorders in women and children,such as anaemia,vitamin deficiency,etc. were included,the number would have been much higher.

What is clear, is that the magnitude of the problem, regardless of varying estimates, is definitely intolerable.In addition to the human suffering it causes,malnutrition has negative effects on an individual's long-term capability for taking advantage of economic opportunities. Though malnutri-

tion manifests itself at the level of individual, the causes of malnutrition are typically a combination of individual,household,community,national,and even international factors (Kenedy and Bouis 1993).

Great stride has been made since 1950's in dealing with problems of hunger,in large part because of improved agricultural technologies.Technological change in agriculture has markedly reduced poverty, its effects have been direct through increased agricultural employment, as well as indirect, through low food prices and increased non-agricultural employment stimulated by increased farmers' incomes. However, despite such breakthroughs, food insecurity and malnutrition remain problems for a large number of people through out the world . This state of affair undoubtedly reflects that there exist some vital missing link which is responsible for such wide spread nutritional problems.

It is generally acknowledged that centrally planned food and nutrition programmes have too often failed to deliver services to most malnourished. As Gopalan (1987) states, " The challenge is how to reach the unreached ". In fact, in meeting this challenge more attention needs to be paid to impart nutrition education to masses as it appears to be practical and promising in long run because ignorance is one of the most important single factor underlying nutritional problems and poverty (Devadas 1993). Four decades back, Dupin(1971) also opined that for a country, nutrition education programmes are imperative not only from the view point of health plans but also for economic plans.

According to Leverton (1968) " Nutrition education is an art and science in itself and should begin soon after the child is born ". Unfortunately,parents can not always educate the child well, as far as nutrition is concerned, because a substantial number of parents are ignorant about the rules of a 'balanced diet' and can only teach what they have seen, done or have heard their elders say. These rules are handed down from generations to generations, which may or may not agree with canons of nutrition science,but in many cases they do not or do so partially. This lack of knowledge is not an exclusive trait of the less privileged classes,but has been observed in all socio- economic groups and in all latitudes, in the most primitive and in the most highly developed societies. A study by Wilson and Lamb (1968) in the USA showed that a large group of women accept false beliefs about food, despite the fact they have completed school or university education. However,Tucker and Sanjur (1988) opined that educated women exhibit behaviours that are more child centred, which leads to better feeding practices and ultimately to healthier and better nourished children. This maternal education effect on child nutrition has been documented for both formal and informal education of mothers (Kennedy and Bouis 1993). Whatever the case may be, but one thing is certain that problems of nutrition are not particular to certain groups of people; they are diverse and exist every where .

Majority of people feel, that abundance and availability of food alone can solve the nutritional problems. It means that countries which have enough to eat do not face the problems of nutrition. But the truth is far from it. Inspite of their affluence, all developed countries are very much concerned

about the problems of nutrition and are very careful in planning nutrition education programmes (Davidson and Pasmore 1975). Nutrition education affords one of the greatest opportunities for individual to control the quality of his or her life and well being, and remains the single greatest challenge to the professional worker in the field of nutrition (Robinson 1978). In fact, a wide gulf separates the science of nutrition as established by research and the application of this science to the feeding of individuals and groups. This gulf between nutrition science and its application can be bridged only if nutrition education is adopted at all levels. The need for well planned food and nutrition education is being felt through out the world since, last four decades, and the subject has been amply debated in all the national and international forums where the problems of nutrition and health have been discussed on continental,regional and national perspective. Among these discussions, the one most worth mentioning here is - White House Conference on Food, Nutrition and Health,which was held in 1969 (Anonymous 1970). In this Conference maximum attention was paid to nutrition education. Four Conference panels directed their recommendations to nutrition education in elementary and high school, advanced academic teaching of nutrition, community nutrition teaching and popular education, and how to reach disadvantaged groups.

Education in school,colleges and universities, Which is a small sector in the community, indicates only a fraction of the effort needed to reach the community. In order to bring about a total awareness on healthy living, the entire community should be educated.In cu- rrent agendas addressing the unresolved malnutrition problems of South Asian countries, two factors are

now recognized as critical to design for viable interventions : a better understanding of the causes of malnutrition in rural communities; and the orientation and participation of the members of those communities (Kashyap and Young 1989). This community focus is now considered fundamental to the success of nutrition - improvement initiative through education.

Malnutrition is the direct result of an inadequate or unbal- anced diet. But this situation is not due to any large scale shortage of food in our country. In fact,in the post-independence India, agricultural productivity in terms of quantity of food grains in cultivated areas has been continuously increasing (Parikh 1996). There has been a spectacular breakthrough in the production of paddy and wheat with annual compound growth rate of 2.89% and 4.55% , respectively. More over, in India agriculture is a way of life rather than a mere technological phenomenon. It was so in past, it continues to be today and it will continue to be so in future.

The rural society in India has a predominant place, as even after four decades of planning, it still constitutes over 76% of our population, 90% of rural population depending on agriculture and among it 75% depends on rainfed agriculture. In terms of agricultural holdings 51% of the holdings still constitutes less than 1 hectare size and 90% holdings are less than 2 hectare size. In terms of gainful work 30% are landless agricultural labourers and 51% are cultivators, many of whom do not have land of their own. The very nature of Indian rural society divided into more than 5,75,000 villages with nearly 4.50,000 villages having population of less than 1000 souls, requires

an integrated efforts in all facets of rural life for proper development with substantial elements of indigenous strategy.

The term " Green Revolution " was coined in 1968 by Dr. William S.Gaud,Director of US Agency for International Development (USAID), to describe the breakthrough in food production caused by the introduction and rapid diffusion of the new semi-dwarf wheat and rice varieties in India, Pakistan and other parts of developing world (Borlaug 1996). " The Green Revolution has had a far reaching impact on the economic and social structures of many low income and food deficit nations, like India ", according to the view point of Borlaug (1996). Today, India is fourth largest grain producer in the world. At the moment, agriculture sector in India is contributing about 32% of the GDP and accounts for two-third of the total employment in the country. An unprecedented increase in food production had taken place during last 35 years, the production quadruplating from 50 million tonnes in 1950-51 to 190 million tonnes during 1994-95. Singh (1996) rightly pointed that Green Revolution ushered in sixties has transformed the status of India from that of " begging bowl " to that of " self-sufficient " or even " exportable surplus ". Our food buffer stock is all time high today (over 36 million tonnes) and we are in a position to export 5-7 million tonnes of food grains. The progress of production in the fronts of horticulture,livestock and fish products has also been phenomenal. India today is the largest producer of fruits, and second largest producer of milk and vegetable.

Despite the impressive growth in the agricultural production, still India's Human Development Index is among the lowest (134th) and of the

total population, 37.4% are below poverty line (Singh 1995). On an average, the percentage of population below poverty line of all developing countries of the world is 30%. According to projected estimate of United Nation Population Agency, the world population will reach to the mark of 6 billion by the year 2000, of which more than 1 billion will be the populations of India alone (World Development Report 1992). According to Borlaug (1996), future world food demand will be determined by the two factors : population growth and per capita food consumption. If we seriously look at this frontier,India's explosive population growth presents a very gloomy picture, as it is estimated that by the year 2025 the population of India will be more than double that of the population of 1994 (884 million) (World Development Report 1994).

The need for sustainable development, and its connection with population, poverty; illiteracy and environmental degradation ha- ve been increasingly recognized in recent years (Daly 1990, Anonymous 1994a). For developing country like India, the basic concept behind sustainable development in the domain of health, food and nutrition, is un-interrupted flow of food material required for healthy development of the individuals, both physically and mentally, across all the section of society irrespective of caste, creed, gender and, social and economic groups.

What ever the case may be, despite the fact that India has achieved tremendous increase in the frontier of food production, yet the nutritional problem of the country continue to be formidable. In fact, it is time to recognize the seriousness of the problem. In coming 30 years, almost half

the Indian population will comprise the people who will be physically and mentally stunted (Venkatram 1995). At the moment bitter fact is : India has the largest number of malnourished children in the world, and only Bangladesh and Nepal exceed India's percentage of poorly nourished children.

A rough calculation shows the extent of the problem - 70% of the 350 million children in India are poorly nourished today. That gives us a figure of 245 million. Every year 25 million of Indians are born. If the present rate of malnourishment continues, it means 17.5 million substandard human beings are get added to the population each year over the next 30 years; by 2025 or so, 525 million intellectually and physically poor human beings will have been added to the populations bringing the total to 770 million, i.e., almost half the estimated Indian population then of 1.6 billion.

It is disgusting that countries which were worse off than India two decades ago, today boast of a much better human resource. Thailand, Indonesia, Malaysia, and of course China have done better than us in effectively controlling the problem. In south-east Asia over the last 10 years, the actual number of malnourished children has fallen from 28 million to 20 million. Even in African countries, especially the countries of mid-east and north Africa, famous for periodic famine and drought, have healthier children, for they have started paying particular attention to food issues. World Development Report of 1992 estimated that in the year 2000 the percentage of population below poverty line will be 31% in the countries of mid-east and

north-Africa as compared to 37% for the countries of South Asia, which include India also (Projected figures). (World Development Report 1992).

Of course, poverty and inequitable access to resource are two key factors leading to malnourishment. Yet another strong factor is the lack of education. 'Ignorance' together with poverty, which it often accompanies, is basically responsible for majority of cases related to malnutrition. It has been well observed that in many places in the world, malnutrition is the result of ignorance and prejudices than of the poverty and shortage of food (Zaidi 1982).

More than a decade back, Coloane (1983) argued that agricultural development strategies have often failed or missed the importance of nutrition while emphasising only production component. Increase in over all food production do not automatically lead to improvement in nutrition. Had it been so, we should not have the much problem in the nutritional front in India, as food production from the period of beginning of green revolution in 1960's is sustained during past 30 years, touching an all time high level of 190 million tonnes during 1994-95. But the bitter facts are that, India has the largest number of malnourished children in the world today; 85% of Indian women population is anemic due to the denial of proper nutrition in their growing and child bearing years ; 250 million Indians are living in iodine-deficient areas and a large majority of them are suffering from the diseases related to iodine deficiency; the infant mortality rate (IMR) is 94 per 1000 live birth; maternal mortality rate (MMR) is fifteen times higher as compared to U.K.; and many other nutritional disorders like, PEM (protein energy mal-

nutrition), endemic fluorosis, vitamin - A deficiency, lathyrism, etc. also afflict a large segment of Indian population in general, and to compound the problem infectious diseases like, TB and malaria have made a come back (Shukla 1982, Devadas 1993, Venkatram 1995). Thus with a population of approximately 900 million, of whom about 50% are illiterate, the nutritional problems faced by the country are multi dimensional.Bhola (1983) rightly pointed out that illiteracy is closely related to poverty, hunger, under-development, and malnutrition problems.

In the 1991 census of India, as in earlier censuses, among other characteristics, the literacy status of each individual was ascertained by applying the yardstick of whether one could read and write with understanding in any of the languages. A person who could read but not write was not treated as literate. Recognizing the fact that ability to read and write with understanding is not ordinarily achieved until one had some schooling or had at least some opportunity to develop these skills, it was felt by Ministry of Human Resource Development and planning Commission that only the population aged seven years and above should be considered as literate or illiterate. Of the 838.58 million people counted during 1991 census in India (excluding Jammu and Kasmir where 1991 census was not held), 688.16 million were aged seven years and above. Out of these 688.16 million people aged seven years and above, 359.28 million were literates, 328.88 million were illiterates and thus this fixes the 1991 census literacy rate to 52.21%.

To study the trend of literacy growth in a decade in more intensive manner the population of Jammu and Kashmir (where census of 1981 was

not held) and Assam (where census of 1981 was not held) were excluded. Table 1.1 gives the 1981 and 1991 census total population; population aged seven years and above and literates; and illiterates aged seven years and above for the country excluding Jammu and Kashmir, and Assam. The analysis of data showed that between 1981 and 1991 the population aged 7 years and above increases by 24.98%. The growth of literates during the same period was 49.37% where as illiterates increased by only 6.07%. Significant sex differentials existed in the literacy rates but, these have narrowed down during 1981-1991, as the male literates increased by 42.41% while the female literates increased by 63.57% and the male-female differential declined from 26.65 percentage points in 1981 to 25.01 points in 1991. The further analysis of data indicated that the sex ratio (female per 1000 males) among literates increased by 73 points, from 491 in 1981 to 564 in 1991. Further, there was a large urban-rural differential in literacy rates. Between 1981 and 1991 literacy increased substantially in both rural and urban areas but by 1991 the urban literacy rate, at 73.01% was quite high compared to the rural literacy rate of 44.54%. As mentioned earlier, out of 816.7 million people in the country (excluding Assam and Jammu and Kashmir),349.76 million people were literates. These literates are, however, not spread evenly among states and union territories. Table 1.2 include figures of literacy rate in different states and union territories of India.

In fact, literacy is considered as one of indicators of educational development. It facilitate effective discharge of ones family, social, cultural, religious and economic responsibilities. Literacy is envisaged as an effective instrument of realisation of important objectives of macro policy, focussing

Table 1.1. Total population, population aged 7 and above,literates, illiterates and literacy rate by sex and rural-urban residence, in India 1981-1991*

Population	Total Rural Urban	1981			1991		
		Person	Males	Females	Person	Males	Females
1	2	3	4	5	6	7	8
Total population	Total	659.30	340.76	318.54	816.17	423.56	392.61
	Rural	502.88	257.56	245.32	602.89	310.98	291.91
	Urban	156.42	83.20	73.22	213.28	112.58	100.70
Population aged7 years and above	Total	536.21	278.04	258.17	670.17	348.47	321.70
	Rural	406.19	208.31	197.88	490.13	253.07	237.06
	Urban	130.02	69.73	60.29	180.04	95.40	84.64
Literates aged7 years and above	Total	234.15	157.08	77.07	349.76	223.70	126.06
	Rural	146.60	103.51	43.09	218.32	146.38	71.94
	Urban	87.55	53.57	33.98	131.44	77.32	54.12
Illiterates aged 7 years and above	Total	302.06	120.96	181.10	320.41	124.77	195.64
	Rural	259.59	104.80	154.79	271.81	106.69	165.12
	Urban	42.47	16.16	26.31	48.60	18.08	30.52
Literacy rate among population aged 7 years & above	Total	43.67	56.50	29.85	52.19	64.20	39.19
	Rural	36.00	49.69	21.77	44.54	57.84	30.35
	Urban	67.34	76.83	56.37	73.01	81.05	63.94

* Excludes Assam and Jammu & Kashmir.
Source : Census of India-1991, Series-1, paper 2 (1992)

Table 1.2. Literacy rates for states and union territories 1981-1991*

S. No.	India/State or Union Territory	Population in 1991 (million)	Literacy rate		Rank	
			1981	1991	1981	1991
	1	2	3	4	5	6
	India*	816.17	43.67	52.19		
	States					
1	Andhra Pradesh	66.51	35.66	44.09	24	25
2	Arunachal Pradesh	0.86	25.55	41.59	30	27
3	Bihar	86.37	32.05	38.48	28	30
4	Goa	1.17	65.71	75.51	6	5
5	Gujarat	41.31	52.21	61.29	12	14
6	Haryana	16.46	43.88	55.85	20	21
7	Himachal Pradesh	5.17	51.18	63.86	13	11
8	Karnataka	44.98	46 21	56.04	19	20
9	Kerala	29.10	81.56	89.81	1	1
10.	Madhya Pradesh	66.18	34.23	44.20	25	24
11.	Maharashtra	78.94	55.83	64.87	10	10
12.	Manipur	1.84	49.66	59.89	16	16
13.	Meghalaya	1.77	42.05	49.10	21	22
14.	Mizoram	0.69	74.26	82.27	3	2
15.	Nagaland	1.21	50.28	61.65	14	13
16.	Orissa	31.66	40.97	49.09	23	23
17.	Punjab	20.28	48.17	58.51	18	17
18.	Rajasthan	44.01	30 11	38 55	29	29
19.	Sikkim	0.41	41.59	56.94	22	19
20.	Tamil Nadu	55.86	54.39	62.66	11	12
21.	Tripura	2.76	50.11	60.44	15	15
22.	Uttar Pradesh	139.11	33.55	41.60	26	26
23.	West Bengal	68.08	48.65	57.70	17	18

S. No.	India/State or Union Territory	Population in 1991 (million)	Literacy rate		Rank	
			1981	1991	1981	1991
	1	2	3	4	5	6
	Union Territories					
1.	Andaman & Nicobar Island	0.28	63.19	73.02	8	8
2.	Chandigarh	0.64	74.81	77.81	2	4
3.	Dadra & Nagar Haveli	0.14	32.70	40.71	27	28
4.	Daman & Diu	0.10	59.91	71.20	9	9
5.	Delhi	9.42	71.94	75.29	4	6
6.	Lakshadweep	0.05	68.42	81.78	5	3
7.	Pondicherry	0.81	65.14	74.74	7	7

* Excludes Assam and Jammu & Kashmir
Source : Census of India-1991. Series-1, paper 2 (1992)

mainly on socio-economic change (Ahmad and Nuna 1987). Though the census figures on literacy rate appeared to be highly encouraging, but a recent study of Kashinath (1995) on the magnitude of actual progress in literacy during 1981 to 1991 in quantitative and statistical terms exhibited that difference between 1981 and 1991 censuses is not significant in case of literacy rates of urban males, urban females and both sexes in urban areas (combined values), and also in case of literacy rates of rural males, females and both sexes in rural areas (combined values). However, the rank correlations between literacy rates of males and females in both 1981 and 1991 census showed an improvement in male literacy rate compared to females literacy rate in both rural and urban areas.

If we look on the trends education expansion in India, the growth which has taken place since the independence is phenomenal. The number of schools increased from 5,30,000 in 1950-51 to 8,11,022 in 1991-92 and the enrollment in schools increased for about 24 million in 1991-92 (Anonymous 1995). The great progress has been made in the front of higher education, including technical, and advance education in various fields of science and humanities. Since independence gross enrollment ratios have gone up many times and have reached 102.74% in classes I to V and 61.15% in classes VI - VIII. Enrollment of girls as a ratio of total enrollment during 1991-92 was 39% at primary stage, 33% at middle educational stage and 28% at higher educational stage. It is heartening to note that education in India, which has been generally identified with liberal education is now veering towards 'occupational education',for sizable segments of the students' population. The main objective of the 'occupational education' is

to vocationalize higher secondary level education, and to expand and consolidate it on a regular basis.

Though above mentioned figures depict some encouraging dimensions in literacy and education front, so crucial for national development, but if we see the absolute figures of literacy the situation appears to be very gloomy. The number of illiterates during the period of our independence was 240 million excluding 0 to 7 years age group, it increased around 330 million in 1991. If this trend to be extrapolated, the level of illiteracy in India will be so high around the year 2000 that it would approximately constitute nearly 50% of the total illiterates in the world. Presenting above mentioned statistics, Dr. K. Kasturirangam, chairman, space commission and secretary,Deptt. of space, Govt. of India, while delivering fourteenth convocational address of Manglore university stated that there are enormous challenges and we need to mount a multi pronged attack for tackling the problem of literacy and education (Kasturirangam 1996). The trends of dropout rates of our young school going population for the year 1980- 81 to 1990-91(Table 1.3) further present a very grim picture as far as development, expansion and improvement of education is concerned (Anonymous 1996).

From the whole preceding discussion one thing is crystal clear that India is practically caught in a web of population explosion, poverty, illiteracy and mainourishment of masses. As discussed earlier also, Venkatram (1995) in his essay entitled "Spectre of stunted Indians" rightly pointed out that in another 30 years, almost half of the Indian population will comprise of people who will be physically and mentally stunted and therefore, it is the time to

TABLE 1.3. TRENDS OF DROPOUT RATES OF SCHOOL GOING POPULATION IN INDIA FROM 1980-81 TO 1993-94.

Year	Classes	Dropout rates (%)		
		Boys	Girls	Total
1980-81	I - V	56.20	62.50	58.70
	I - VIII	68.00	74.90	72.70
	I X	79.80	86.83	82.46
1985-86	I - V	45.84	50.27	47.61
	I - VIII	60.70	70.04	64.42
	I X	73.97	83.16	77.62
1990-91	I - V	40.10	45.97	42.60
	I - VIII	59.12	65.13	60.91
	I X	67.50	76.96	71.34
1993-94	I - V	36.07	49.95	68.41
	I - VIII	39.05	56.78	74.54
	I X	37.32	52.80	70.90

Source : Anonymous(1996)

recognize the seriousness of the problem that confronts us. According to him (Venkatram 1995) lack of education is a strong factor leading to malnourishment and to substantiate his statement he argued that in Kerala state the higher female literacy rate is the main reason behind the lowest infant and child mortality rates, while the trends are just reverse in case of Rajasthan, UP, MP and Bihar, where the female literacy rates are very poor.

The nutrition is a vital segment in context of national development, since it is directly related with physical and mental health of the population. It is beyond doubt that only a nation of sturdy people with strength and stamina can face the challenges of modern life successfully. The intellectual and moral progress of a nation also depends upon the physical fitness of its people. Therefore, if India has to realise the mental and moral potentialities of her people, it is imperative that each and every individual must have a healthy, vigorous and productive life. In fact, good nutrition is an indispensable component of healthy life. Malnutrition lowers one's resistance to disease, resulting in higher morbidity, apathy, lethargy and reduction in working efficiency, and these factors lead to a cyclic chain - low income, low standard of living, poverty and back to malnourishment and diseases (Devadas 1993 a). Against this background, the 1978 **Alma Ata** declaration "Health for all by 2000 AD" gave prime importance to nutrition.

It is an accepted fact and mentioned earlier also that malnutrition is not due to merely the unavailability of agricultural production to cope with the demand of growing population, but other factors like ignorance, false beliefs, taboos, traditional customs, etc. are equally responsible. In a country

like India, having 4000 castes and communities, 3000 mother tongues and 4000 faiths spread along her length and breadth, deep rooted traditions, taboos and false beliefs have imprisoned the masses, and as a consequence of which the problem of nutritional disorders are more acute. Although the problem of malnutrition are found in every segment and group of population, yet there are some who are particularly vulnerable viz., toddlers, pre-schoolers, adolescent girls, and the pregnant and lactating women.

As discussed earlier in India female literacy rates are very poor as compared to male literacy rates. The female literacy rate of a country depicts women's educational status and also their relative position in educational scenario in comparison to men's (Chauhan 1996). At the same time it also exposes the scenario of women's future in the frontiers of health, education, employment and socio-economic status. Table 1.4 shows the literacy rates of women in India over a period from 1901 to 1991. The data reveals that there has been an increase in women's literacy from an insignificant value of 0.7% in 1901 to 39.42% in 1991. It may be a quantum jump but nevertheless, it is much less than what was desired. Undoubtedly, the state of women's educational development and growth in our country is depressing and de-motivating.

Devadas (1993b) rightly pointed out that a considerable proportion of our population subsist on inadequate diets, and women folk and children are number one victims of undernutrition. She (Devadas 1993b) further opined that ignorance and illiteracy are one of the most important factors for such widespread nutritional disorders in women and children. According to

Table 1.4 Literacy rates in India, 1901 to 1991

Year	Percentage of literates of total population		
	Persons	Males	Females
1901	5.3	9.8	0.7
1911	5.9	10.6	1.1
1921	7.2	12.2	1.8
1931	9.5	15.6	2.9
1941	16.1	24.9	7.3
1951	16.7	25.0	7.9
1961	24.0	34.4	13.0
1971	29.5	39.5	18.7
1981	36.2	46.9	24.8
1991	52.1	63.9	39.42

Source : Sharma and Rutherford (1983) ; Census of India - 1991, Series-1, paper 2 (1992)

a report published by UNICEF (1990), an Indian woman spends the greater part her reproductive life in pregnancy and lactation, and the maternal depletion is seldom compensated by adequate nutrition. In fact, the diseases related to nutritional disorders play havoc in our country, though almost all such diseases are entirely preventable with very little effort. Thus there is an even greater necessity to look into the reasons for the heavy toll of lives they still take in India, when they have been almost eradicated in majority of world's developed nations. It is only too well known that a particular nutritional disease is caused by the deficiency or, rarely, an excess of some principle in diet. But what the study of 'nutritional problems' implies is the effect of that particular disease on masses and what factors actually causes deficiency. It is only on comprehending the mountainous dimensions of the problems. The need of hour is to develop effective measures which can be recommended to the vulnerable part of population for practice in daily life in order to eradicate the problem. Here lies the importance of nutrition education as it can effectively be used as a tool for intervention.

In our country, where around 330 million people of 7 years age group are illiterate and another millions are neo-literates, about whom's learning skills and knowledge levels nothing can be said or known conclusively, functional nutrition education is of paramount importance for all age group and all times, especially for women and children, the most vulnerable segments of the population. Contrary to this, in our country, programmes for combating malnutrition have been initiated in terms of provision of mid-day meals and supplementary nutrition in schools and community (Gupta 1983). More over, the poverty alleviation, employment generation,

women and children development programmes, etc. also have sufficient emphasis on nutrition component and ultimately aim at the well beings of the nation's population. Billions of rupees have been and are being spent on all such above mentioned programmes every year but their impact in nutritional front is very little (Gupta and Khosa 1983). The reasons for this are not difficult to seek. These programmes are merely supplementary feeding programmes adhoc operations and are taken up in a way of giving away doles, and as such these have little self-generation quality in them (Gupta 1983). Gopalan (1980) also pointed out that drawback of these progrmmes is their over emphasis on feeding rather than on motivation of people and education of families for changing their food habits.

According to Devadas (1993b) though all supplementary nutrition and developmental programmes have satisfactory co-ordination and linkage among various national and international agencies, but the vital element of nutrition education is all together lacking in these programmes. Policy planners, experts, and national and international agencies have mostly been suggesting alternative strategies for combating the problem of malnutrition and ills associated with it from different angles, rarely has the role of education been truly emphasized in combating this issue, which is threatening the very future of mankind.

If we look present education system in context of nutrition education in our country, its workability and relevance is far from what is desired. Our approach has been mainly burdened with imparting of the **3R's** and Health, Physical and Nutrition Education have been grossly neglected subjects at

different stages of education (Devadas 1980) . Besides proper intake of nutritionally balanced food, many factors like general paucity of funds in the schools, lack of facilities for training, equipment and coaching, little weightage to physical growth and development in school curriculum, over crowding of schools, lack of medical check-ups of children and utter lack of remedial programmes for malnourished, etc. have contributed significantly to malnutrition problems of school going children in one hand and on the other, the teachers' apathy towards these aspects have substantial contribution for proliferation of this problem, as the teachers have never considered these aspects important and worth emphasizing. Gupta and Singh (1981) rightly pointed out that knowledge of basic concepts of nutrition and health awareness is very weak among school going younger population as well as in case of the pupils in later years of schooling. In fact, schools, whether government or private, are run under the notion that what ever is being provided by them is adequate for the pupil (Gupta 1983).

The scenario of nutrition education in specific terms is even more gloomy. The text books prescribed for the students are utterly deficient as far as basic concepts of nutrition education are concerned. Lack of trained dietitians, absence of mother and child care programmes and packages/capsules for parent's education have all led to further deterioration. There is hardly any machinery which can effectively co-ordinate between parents and children, especially during the early years of schooling, and consequently there is little change in the age old beliefs and food habits. The parents are likely to carry the feelings that in whatever manner they are upbringing their children is good (Gupta and Sharma 1981). This view is also

shared by the teachers, as we do not have the teachers trained for nutrition education. In the nutshell the teachers, parents and administrators have little awareness regarding what nutrition education is. No wonder, the slogans like **"health for all by the year 2000 A.D."**, **"integrated child development for one and all"** seldom filter down to the grass root level.

The situation in senior school levels is also not much different. While science has been introduced as compulsory subject in ten year schooling but neither the acquisition of knowledge about nutrition nor creation of awareness regarding nutritional well being is incorporated in curriculum. In higher or university level, the nutrition and food science courses are generally restricted to Home Science colleges/ institutions. One of the major objectives of Home Science institution/colleges is to develop good nutritional habits and this purpose is served by providing instructions through various subjects in the domain of food and nutrition. But such institution of higher learning, imparting education in the field of food and nutrition accounts for the fraction of the university faculties, colleges and institutions imparting higher education and training in other fields of science and technology. Thus the out-put from such institutions is too meager to serve the huge population of India, which require large scale and multidimensional intervention through nutrition education to correct the nutritional disorders.

Robinson (1977) observed that nutrition education must continue throughout the individual's life in order to accommodate the development in nutrition science and for changing economic circumstances, health requirements and adjusting to the new food products being developed. But in

developing countries like India, where people living constantly under the grip of illiteracy and poverty, the stark realty is that they neither have the mental make up (mind set) nor feel the necessity to gain nutrition knowledge (Devadas 1993 b). She (Devadas 1993 b) further opined that government can not establish any expensive set-up just to impart nutrition education to masses and therefore nutrition education should be made essential component of various developmental programmes. To some extent these observations may be true but large scale alternative nutrition education programmes in form of informal education are highly essential, for India has to face the challenges of 21st century successfully.

It is not that our central and state governments are non serious about the situation of Indian population in nutritional front. In the year 1993, Government of India adopted **National Nutrition Policy**. This was followed by the adoption of **National Plan of Action on Nutrition** in 1995. In the National Nutrition Policy and National Plan of Action on Nutrition two most important interventions recommended to improve the nutritional status of masses are :

"Empowering mothers with nutrition and health education ", *and*

"Enlisting better community participation through health and nutrition education by involving community based monitoring system in management of nutrition".

The emphasis given in said two fronts i.e., nutrition education to

mothers and community participation in the programmes of nutrition education itself reflects the seriousness on the parts of policy makers, planners and administrators as far as formulation and execution of nutritional education programmes are concerned. Central Health Education Bureau is an apex organization in the field of health and nutrition education in the Directore General of Health Services. The organization was set up as early as in 1956 to coordinate and promote health education. Realizing the fact that nutrition education is the subject of national importance, the ministry of food has recently set up a Food and Nutrition Board to impart and monitor nutrition programmes based in improving nutritional status of the population through a combination of measures such as nutrition education and training, development and promotion of nutritious food, and fortification and enrichment of the food. The food and nutrition board is imparting nutrition education and training through its network of 43 **Community Food and Nutrition Extension Units** located in 27 states/ union territories.

Empowering mothers with nutrition education, and enlisting better community participation through health and nutrition education by involving community based monitoring system in management of nutrition as envisaged in national nutrition policy and national plan of action on nutrition are well conceived ideas. In a country like India, where at the moment the half of its total population (7 years and above age) is illiterate and female literacy rate is less than 40% (accounting approximately 200 million in term of absolute number), only community based informal education strategies in form of nutritional improvement awareness campaigns with sufficient indigenous contents can desirably serve the purpose. However, to formulate

and execute such community based nutritional improvement education plans, important issues which need to be addressed through research are :

» What type of packages/capsules should be developed for the different target groups of communities for providing nutrition education ?

» How can community nutrition education can be provided effectively in the rural and urban areas among various subcultures ; geographic, language and ethnic areas ; and among people of different socio-economic status?

» How to develop effective techniques for dissemination of knowledge in community nutrition education programmes, and which aid should be used for effective nutrition education and for whom ?

» How can the impact of different community nutrition awareness programmes be evaluated objectively and scientifically ?

» How can coordination between different departments of central and state governments, developmental agencies and NGOs be ensured for maximum effectiveness of community nutrition programmes ?

All these above mentioned issues have their own importance and significance in formulation, execution and impact assessment of community nutrition education programmes, but one basic question need immediate attention is :

Who should be target population groups in communities to impart

nutrition education through awareness campaigns on priority basis and what would be the easily understandable and rapidly diffusible approach ?

Population Action International (formerly known as population crisis committee) in its report has clearly pointed out that early population stabilization is not possible without raising the status of women through a combined strategy of providing better education and economic opportunities (Shirur 1995). An increase in literacy and educational status of women will have positive effect on population control, maternal morbidity, infant mortality, sanitation and hygiene, and in turn will certainly improve the nutritional status of whole population. Thus intervention programmes through nutrition education must be targeted towards woman folk, who constitute nutritionally most vulnerable segment of population, on priority basis.

In true sense, mothers are the first teacher of children as young children imitates and models their mothers in their own behaviour, action and habit. If a mother has knowledge of nutrition, the same will filter down from one generation to other and so on. The literacy rates of women in rural sector of India is only 13.2% as against the 42.3% in urban sector and naturally the rural women often do not have even little functional knowledge regarding the nutrition and its importance. Against this back-ground, the present investigation was taken up in rural setting of parts (*Thar* desert region) of Rajasthan, which ranked 29th in overall literacy rates among the various states/union territories of the country. The adolescent girls were selected as target group, as *Thar* desert region has long history of early and child marriages. Adolescence is the period from pubescence to adulthood

and extends from 12-13 years to late teens (Kuppuswami 1984). During this period reproductive organs mature and secondary sex characteristics appear, and many other physiological changes take place in the body. In fact, adolescent girls are the future mothers and health status of coming generation depends on the health of adolescent girls.

Thar desert is spread over in 12 districts of western Rajasthan and covers an area of more than 1,95,000 sq.km. The climate of the region is inhospitable, the total annual rainfall varying around 100 mm in extreme west to 450 mm in areas bordering semi-arid tract in eastern part and temperature ranging 0^{o} c (some time during winter season) to as high as 50^{o}c (some time in summer months). Frequent draught are the characteristics of the region. More over,*Thar* is the most thickly populated desert of the world (Jain 1986). Majority of the area is rainfed and therefore, only single crop i.e., 'Kharif crop' is grown. However, in irrigated areas in addition of 'Kharif Crop', 'Rabi Crop' and 'Vegetables' are also cultivated. Entire area is educationally very backward. According to 1991 census figures, male and female literacy rate in *Thar* desert region is 52.24 % and 17.70%, respectively (Anonymous 1994 b).

The periodic recurrence of draught in *Thar* desert region invariably influences the agricultural production and food intake of human population (Tewari 1993a). As in other parts of the country, 85% of the total daily calorie intake of rural population in larger parts of *Thar* is contributed by cereals especially pearl millet (bajra) which is the staple food of rural communities in the region (Krishnamachari et.al.1992). Modified data from same study

(Krishnamachari et.al.1992) revealed that mean calorie intake (K cal/day) in case of females of around adolescent age group in six districts of *Thar* desert region is only 1375 which is far below the recommended (2060) energy intake for this segment of population (Gopalan et.al., revised by Narasinga Rao et.al. 1993).

The **anaemia** which affect 30% of total world population (Latham 1993) and 60-70% of Indian population (Gopalan et.al., revised by Narasinga Rao et.al.1993) is also highly prevalent in *Thar* desert region (Tewari 1993b). The women folk are highly vulnerable to this disorder. Anaemia in our country is essentially due to iron deficiency. Adolescent girls in *Thar* desert region are particularly suffering from iron deficiency anaemia and figures may be as high as 80% (Dr.S.L.Chopra-personal communication). Even in other parts of the country in addition too other nutritional disorders, iron deficiencies anaemia as a result of malnutrition is quite common in adolescent girls and therefore, National Nutrition Policy under the "**direct intervention strategy**" proposes to cover all adolescent girls from poor families through ICDS (integrated child development scheme) by 2000 AD in all community development blocks of the country and 50% of the urban slums, and nutrition education has been recognized as an essential component of the said strategy (Dube 1996). Therefore, iron deficiency anaemia was selected as nutritional disorder in present study.

As indicated earlier that, to educate vast rural communities regarding importance of nutrition, only possible way is to impart informal education through such nutritional awareness campaigns which have sufficient com-

ponents of indigenous strategy. In this context, role of different varieties of arts to impart informal education to rural masses can play a very important role. According to Efland (1984) arts have played a number of roles in education, social cohesion and therapy.

There is a Chinese proverb :'I hear and I forget ; I see and I remember ; I do and I understand'. The proverb addresses a critical area of learning, that of perception. Although perhaps over simplified, it identifies the skills that are integral to learning a subject and the arts-hearing, seeing and feeling. According to Peters and Miller (1982) the cognitive domain embraces all those things that experience has told the mind are true. The process of learning involves all those experiences - hearing, seeing, feeling - on which "Knowing" is based. On this very basis, nutrition education can be imparted very effectively to different target groups in rural communities through video and folksongs.

Television and radio are, today most effective mass media in India and as well as in other countries to disseminate the knowledge in various fields, like agriculture, entrepreneurship development in various sectors. rural development strategies, etc., etc. in one hand and on the other, they are proving very effective in providing regular distant education upto school and university level in various subjects. (Joshi 1987 ; Singh et.al. 1992). As given in Kumar(1992), video has been proved very effective for imparting nutrition education to village communities in Philippines. The nutrition centre of Philippines experimented with video vans to disseminate knowledge of nutrition among the rural folk after systematic development and production

of appropriate video programmes. The viewing of these programmes was followed by selling of supplementary nutrition product "Nutri-pack" (developed and produced by the centre) to audience at a nominal price. Impact study showed persistent success in increasing mother's nutrition related knowledge and improving pre-schoolers' nutritional status. Cost effectiveness studies indicated that these improvements have been accomplished at a cost.comparable to or less than other type of field interventions.

Though studies regarding use of folksongs in education are not available, but they can serve as a powerful medium for imparting nutrition education to rural masses. A folk song is a lyrical, short, simple, less artistic, rhythmic song of a folk community. It generally reflects the social heritage, the environment and the life of the folk living in a particular territory (Srivastava 1974). It is usually created by the folk for their own entertainment, enjoyment, or emotional outlet. It requires no prior setting and no professional skill. It has the capacity of free edition, subtraction and modification, and has no known originator or processor. It is in fact transmitted, circulated and perpetuated spontaneously through oral tradition from person to person or from generation to generation (Krappe 1965). Our folk literature and literature of art were almost inseparable during the medieval period, and even today there are at least few examples where only one difference exists between the two - one is written, the other is oral. Many folk songs presented through radio and television are composed and written by modern artists but characteristically they differ some what from those preserved by oral tradition. Islam (1985) also consider such modified version of folk songs in the

category of 'folk songs' and argued that many Bengali songs composed and sung by noted artists like Abbasuddin and Nirmalendu Chaudhary, would be accepted by the folk and passed on to oral tradition in future, when inspite of their famous authors, they could become folk song - a real part of folklore.

Songs and Drama division of Information and Broadcasting Ministry, Govt. of India has about 50 troupes of its own and more than 500 registered troupes through out the country. Their programmes also include educational strategy by incorporating suitable messages in songs to educate and create awareness among people on many fronts e.g., family planning, modern agricultural practices, various schemes of development, health and child care, etc., etc. According to Bhaskaran (1983) the programmes of these troupes are found to be very effective in communicating the messages among the rural audience as they are composed according to their traditions and cultures, and presented in their languages.

It is beyond doubt that television/video is a powerful medium to spread messages to masses throughout the world and can be effectively used in the field of both formal and informal education (Sharma 1992 ; Saxena 1992). The history of educational TV in India has been more than two decades old. Similarly, folk songs, which is an integral part of our folk culture and oral tradition may be helpful in disseminating the knowledge of vital importance, like nutrition education to different target groups in communities. Rama Raju (1964) rightly stated that folk songs not only remove physical fatigue but also have the power to inspire and elate people.

It is true that our formal education system regarding nutrition education has many drawbacks and it is absolutely incapable of serving such a huge population. However, any criticism of educational system vis - a - vis nutrition education must be analysed against the backdrop of melancholic scenario in which poverty, malnutrition, illiteracy, population explosion, hunger, want, misery, un-employment, exploitation and atrocities, age old taboos and beliefs, all have woven together in a complex fabric with colours of despair, disgust and pessimism (Gupta 1983). In such situation to educate the masses of different target groups in communities regarding importance of nutrition and health care, only informal education through nutritional awareness campaigns/programmes with use of simple but understandable and effective educational tools can be potential viable alternative. Against this very back-ground the present investigation was planned and executed.

From the earlier statement on the components of present study, it is evident that adolescent girls of rural communities in *Thar* desert region were selected as target group; anaemia, a highly prevalent malnutrition related disease in this segment of population is taken as nutritional disorder ; and video and folk songs were identified as tools for imparting education. So the problem for present investigation has been identified as :

NUTRITION EDUCATION ON ANAEMIA THROUGH VIDEO AND FOLKSONGS AMONG ADOLESCENT GIRLS OF *THAR* DESERT (RAJASTHAN)

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