A PROJECT PROPOSAL

FOR AN INTEGRATED NUTRITION PROJECT IN KARNATAKA

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EXECUTIVE SUMMARY

A PROJECT PROPOSAL FOR AN INTEGRATED NUTRITION PROJECT IN KARNATAKA

1. PURPOSE AND RATIONALE :

1.1. An Integrated Nutrition Project will be undertaken in **all** the ICDS Projects of Chikmagalur (7), Gulbarga (11), Raichur (5) and Tumkur (11) in the 4 Pilot Districts of the State from **August 15, 2000.**

1.2. The reason for the above Pilot Project is that the levels of Undernutrition has **not** come down to the desired levels as envisioned in the State's Plan of Action for 2000, among the beneficiary groups of the ICDS. These were the 'Under Twos', the pre-schoolers, the Pregnant (P) and Lactating (L) woman.

1.3. An intergenerational life cycle approach would be adopted wherein, the 'Under Twos', the preschooler (3-6 years), the adolescent girls (first time), the Pregnant and Lactating woman would **all** be linked and targeted through specific nutrition (macro and micro-nutrient) and health (preventive, deworming and reproductive health) strategies.

1.4. **The Consequences** of not addressing the above problem would result in:

'Under Threes': Growth faltering, more episodes of common illnesses especially of the gastro-intestinal tract, poor cognition/ poor physical work capacity in later life and nutritional deficiency diseases of PEM, VAD, IDA, Riboflavin, vitamin C and zinc. The 6-12 month infant is the **most affected.**

The Adolescent: Small and short stature and will probably produce a LBW baby (less than 2500g), will suffer from VAD, mild to moderate IDA, poor cognition and PWC.

The Pregnant Woman: Greatly increased IDA, great Obstetric Risk, infant is most likely to be LBW, high neo-natal and maternal mortality.

The Lactating Woman: Breast-feeds at the cost of her own body tissues. Perhaps as undernourished as her infant, **poor care-giver,** her breast milk will be deficient in vitaminA and iron.

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2. SPECIFIC OBJECTIVES:

Immediate (March to June 2000, 4 months)

- Prof. Tara Gopaldas will be retained by MI to develop the above project proposal. She will review the recent literature and prepare a **detailed Situational analysis** (Please refer Chapter-3)
- On the basis of the Situational analysis, **implementation strategies** will be proposed to reduce the **undernutrition in the vulnerable groups. The emphasis will be on an improved and appropriate food supplement for the 'Under Threes'.**
- Population segments that need to be exposed to a **strong Awareness Programme** from State Capital to ICDS villages, will be suggested.
- **Linkages** with other departments at the **District Level** will be suggested.

- **An innovative way of Training dyads of Nutrition and Health Trainers from the State Level downwards will be suggested.**
- A **Monitoring** and **Evaluation format** for **Delivery, Coverage, Participation** and **Impact** with respect to **Nutrition, Health** and **Hygiene** will be outlined (children 0-6 years)
- **Cost estimates** will be given for each suggested **Strategy** to the extent possible.

Specific short term objectives (July 2000 to December 2000 – 6 months)

(i) **Fill-up all posts in the ICDS Projects of the Study Districts.**

(ii) Start a strong **Awareness Programme for all levels** regarding the **Pilot Project** from January 2001.

(iii) Have Self-Help-Groups in-place and train them to produce a SNP for the '3-6 years' age group.

(iv) Orient/ Train/ Build Capacity in **all** implementing functionaries of the ICDS.

(v) Launch the Pilot as early as you can. (Hopefully by January 26th, 2001)

Specific Medium Term Objectives (January 1st, 2001 to January 2003 – 2 years)

(i) Introduce the Interventions as shown under 'Strategies'.

Specific Long Term Objectives (February 2003 onwards)

(i) Expand or modify to suit the whole state of Karnataka.

In sum : The getting ready period is 10 months; the Intervention is 24 months.

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3. THE PRESENT NUTRITION SITUATION IN KARNATAKA; AND IN THE 4 PILOT PROJECT DISTRICTS

3.1 Demographic/ Socio-economic: The present population of Karnataka is 5.5 crores in 2000. Approximately 40% of the total population or about 2.2 crores is **vulnerable. The vulnerable segments below the Poverty Line are estimated to be 88 lakhs. The food supplement Bill alone for ICDS beneficiaries in just the 4 districts, in the 2 years-Pilot-Project is estimated to be about Rs.70 crores.**

3.2 Burgeoning Population : Karnataka is a 'young in age' State like the rest of India. About 50% are under the age of 24. Most of the female population want a **terminal method of birth limitation after 2 live births.**

3.3 Reproductive Health Services: Are well above the average.

3.4 Food Security and Agriculture: Eighty percent of Karnataka's population is engaged in agriculture and eat off what they grow. On the face of it neither the Urban nor Rural Karnatakan lacks in **cereals.** The latest National Nutrition Monitoring Bureau (NNMB) survey shows that per capita production of pulses are down. The Karnatakan does have a **better Food Security Picture** than many other States in India. Targets for production of staple cereals in 2000, are **higher** than last year. However, the poor just cannot afford to buy expensive items such as fats/ oils, flesh foods, fruits and vegetables that are the natural food source of vitamins and minerals. Tumkur, Gulbarga and Raichur, 3 of our Pilot Projects have large milk dairies which can fortify their double toned milk with vitaminA at the very least.

3.5 Large Losses of Fruits/ Vegetables during the Glut Season

(i) Much better storage and preservation methods are required at the point of harvest before the produce leaves for the market.

(ii) Dehydration of vegetable/ fruits should be taken up by the Horticulture Department.

(iii) A Poor Man's Cooling box should be developed.

3.6 Nutritional Profile of the Vulnerable Groups in Karnataka:

(i) **The infant 6 months to 12 months of age; and the child 1-3 years is in a chronic state of starvation.** This age-group, unwittingly, gets minimal amounts of home food. **She/ he is practically invisible at the AWCs.** The 'Under Threes' needs to be treated as a **special group.**

(ii) **The adolescent girl** consumes more than her RDA in cereals. She is able to appease her raw hunger with respect to pulses, roots/ tubers, other vegetables, fats/oils, sugar/ jaggery.

(iii) **The pregnant woman** gets far less than what she requires Vs her RDA in all the food groups except for cereals.

(iv) **The lactating woman : The picture of food and nutrients is even worse in the lactating woman.**

In sum, the 'Under Threes', the 'Above Threes', and the P/L women need a food SNP with a hefty dose of micronutrients. The adolescent needs just her micronutrients.

3.7 Undernutrition in terms of Stunted/ Underweight/ Wasted Children

Children:

Overall, 54% of the 'Under Fours' are underweight; 48% are stunted; and 17% are wasted.

Women (15 to 40 years of age):

42% in Gulbarga; and 50% in Tumkur districts had a BMI less than 18.5. Overall 30% were at obstetric risk by the weight indicator (less than 38kg); and 21% by the height parameter (less than 145 cms) Obstetric Risk (by weight) was 28% in Gulbarga and 19% in Tumkur.

3.8 Food habits, Taboos Regarding Infant Feeding:

Negative:

(i) Abrupt weaning and virtual starvation of the infant from 6 months onwards: use of unsafe water; poor breast hygiene, early marriage (14^{+} years).

(ii) Slum mothers are breast feeding only upto 4 months; some stop when the infant is just 2 months of age.

(iii) The other habits such as discarding colostrum; prelacteal feeds is no better or worse than the rest of India.

Positive:

(i) In the ragi-growing regions, sprouted ragi-powder is often given to the baby as his first weaning food. This should be capitalized on.

(ii) Excellent net-work of some 40,000 trained dais. They can become excellent communicators of IEC to the parents – who trust them.

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4 INCLUSION OF SOME GOALS OVER AND ABOVE THAT STATED IN – KARNATAKA'S GOALS FOR 2000AD.

4.1. Some more Nutrition goals that could be introduced in this Pilot Project are;

- Water is food. Ensure that safe drinking water is available in the Project areas.

- Include 5mg zinc/ day in the vitamin-mineral pre-mixes. It is absolutely safe and improves the growth of the child enormously. USAID-donated foods, which India has been accepting for decades in its ICDS, fortifies its Corn-Soya-Blend (CSB) with 5mg zinc/ 100g CSB.
- Sometimes indirect measures such as periodic and mass community, or at least deworming of the beneficiaries in the ICDS & MDM, improved sanitation, better personal hygiene of mother and child can improve the nutritional status of the child.
- Massive Nutrition-Education is required for all Health and Non-Health functionaries of the ICDS and MDM. So also for the higher rungs of medical personnel.
- Make Public Health Nutrition a compulsory subject in all Medical and Health Institutions of the 4 Pilot Project Districts.

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5 A STRONG AWARENESS CAMPAIGN – ESPECIALLY AT THE DISTRICT LEVEL:

- The I&B, Karnataka, and the Food & Nutrition Board, Karnataka should play a signal role in creating **Awareness** about the Nutrition Situation, the consequences, and the purpose of the Pilot Study.
- All levels – Politician/ Bureaucrat to the Village Panchayats and village homes should be made aware of the above.
- Tremendous change in the mind-set of the impelementors of the National Nutrition Programmes is urgently required.
- Medical colleges need to introduce Public Health Nutrition as a compulsory subject.

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6 INTER-SECTORAL LINKAGES:

For the purpose of this Pilot Project, the five State Departments that have to work in close partnership and have well understood linkages are:
The DWCD; the DH&FW;Zilla Panchayat; Civil Supplies; Information and Broadcasting.

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7. ORIENTATION/ TRAINING AND CAPACITY BUILDING

- All vacant posts at the District, Block and village-levels of DWCD and DHFW, need to be filled up **before Training commences.**
- NIPCCD, Karnataka will orient the Senior Level Officers at Bangalore for **no cost.**
- The innovation of Training dyads of Nutrition and Health Personnel to synchronize with the major innovation and the strategy of Integrated Nutrition-Health (INHP) Days will be instituted.
- The innovation of the highest rung of Master Trainers, namely, the CDPO cum PHC doctor,- dyad, training the next tier of Supervisor cum ANMs and AWWs, CCAs, TBAs/ adolescent girls will be instituted.
- Emphasis will be placed on 'acting-out' each innovative service input for the field level implementers, namely, the Supervisor-ANM dyad and the AWWs/ CCAs/ TBAs/ adolescent girls.
- The Budget will have to be worked out between DWCD and DHFW.

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8. IMPLEMENTATION STRATEGIES/ BASELINE ASSESSMENT SURVEY/ TIME FRAME/ TYPE AND NUMBER OF BENEFICIARIES/ COST

I. <u>Must be Implemented or Coordinated Strategies by DWCD-K (8.1. to 8.5):</u>

8.1. Programme Organisation and Management

- At the Apex Level an Advisory Committee of Ministers, namely the Minister of Woman and Child (Chair); the Minister of Health and Family Welfare, the Minister of Panchayati Raj and

other concerned Ministers along with their Principal Secretaries and a few eminent experts in Nutrition, Health, Food Technology will be set-up.

- A Programme Management Cell (PMC) will be set-up to oversee the day-to-day Planning Management and Implementation of the various stretegies.
- Modern Methods of Management will be used.
- The Budget for the PMC for two-year Pilot Study is estimated to be about **6 crores.**
- DWCD will pay.

8.2. Awareness Campaign: (please refer point 5)

- A Baseline Assessment Survey will be carried out by a professional Market Research/ Advertising Agency located in Bangalore, and in the 4 Pilot Districts of Chikmagalur, Gulbarga, Raichur and Tumkur.
- This is the 'kick off' strategy and a launch by AIR and TV should be in place by **26th January, 2001.** Thereafter from January 2001 to January 2003.
- The target audience would be the whole State of Karnataka, with emphasis on Bangalore and the 4 Pilot districts. The Awareness Campaign will be sustained throughout the 2+ years of intervention. It is expected that the Pilot will create a **demand for a similar innovative and strengthened ICDS in all the other districts of the State.**
- **The estimated cost is Rs.3 crores.** (taken at a notational value of Rs.10/ beneficiary x 15 lakh beneficiaries x 2 years). It may be noted that media budgets depend on the frequency, reach and the length/ duration of the radio/ TV spots used.

8.3. For the Under Threes in the ICDS of the 4 districts:

- **Innovations:**
  - (i) **Integrated Nutrition Health Days** on the 1st and 3rd Saturday of every month at every Anganwadi in the Pilot Programme.
  - (ii) A well supervised **'Take-Home-Ration' (THR) delivery system.** The adolescent girls at 5-homes/ girl, will supervise the THR at the home level to **reduce 'Sharing'.**
  - (iii) Community Change Agents (CCAs)
  - (iv) An appropriate SNP **of cereal-pulse-sugar-an Amylase rich food + the entire RDA of vitamins and minerals.** A nutrient dense yet 'liquidy' reconstituted SNP will make the feed go down faster.
  - (v) Mass deworming (DHFW will synchronize, pay and implement)
  - (vi) Common medicines (ORS, anti-malarials etc.) (DHFW will synchronize, pay and implement)
  - (vii) Strengthening Mega vitamin-A from 9months to 36 months (DHFW will synchronise, pay and implement.)
- **A Baseline Assessment** and Pre-Post evaluations will be conducted.
- **Time Frame** Jan 2001 to Jan 2003.
- **Type and Number of beneficiaries:** 2.30.000 'Under Threes'.
- **Cost : Rs.40 crores.** (DHFW will pay approximately Rs.6.9 crores out of Rs.40 crores. This is at Rs.150/ beneficiary/ year x 2 years).

8.4. For the 'Above Threes' in the ICDS of the 4 Districts:

- **Implementation Strategy :**
  - (i) Since the SHGs are not in place, all the ICDS 'Above Threes' in the other 3 Pilot districts other than Gulbarga, will continue to get whatever they were getting as SNP.

(ii) All 'Above 3s' in the ICDS of the 4 districts will also get such inputs as deworming 2 times a year.

(iii) They will also get mega vitmainA 2 times a year.

(iv) They will be eligible for the common medicines as the 'Under Twos'.(DHFW as at 8.3 (v), (vi) and (vii) will synchronize, pay and implement points (ii), (iii) and (iv).

- **The only innovation** in Gulbarga, will be that **SHGs** will make cooked or processed products such as Ladoos, Ragi Muddes, Chappatis etc. An "Add On" of the micronutrients for this group will be introduced. The cooked micronutrient enriched SNP will be **served in the Anganwadi.** If aggreable MYRADA a well known NGO in Gulbarga could be approached to manage this enteprise. **Micro-Credit** will be given to the woman at a maximum of Rs.20,000/- per enterprise.

- **Baseline Assessment:**
  (i) Baseline Assessment and Qualitative Research Studies will be done on SHGs ability to perform, deliver and be a sustainable enterprise.
  (ii) Pre-Post Evaluations will be done.

- **Time Frame:**
  (i) For Chikmagalur, Raichur and Tumkur the Time Frame, with additional inputs of deworming, mega vitaminA and common medicines will be : January 1st 2001 to January 1st 2003.
  (ii) For Gulbarga, as and when the SHGs are in-place and the enterprise can be operationalized. Hopefully from 1st January, 2001 to January 1st, 2003.

- **Number and Type of Beneficiaries:**
  (i) In Gulbarga alone there would be 86137 **'Above Threes'** (Rounded off to **1,00,000** as always more children come in for the SNP). Also the extra food made by the SHGs can be sold in the open market.
  (ii) The number of 'Above Threes' in all **4 districts** for common additional inputs of deworming, common medicines, mega vitaminA would be as under:

Chikmagalur	29,517 rounded off to	30,000
Gulbarga	86,137 rounded off to	1,00,000
Raichur	42,788 rounded off to	40,000
Tumkur	71,450 rounded of to	70,000
	2,29,892	**2,40,000**

Cost: Rs.17.20 crores (Cost to DHFW would be Rs.4.8 crores. The remaining amount would be borne by DWCD).

8.5. Adolescent Girls in the ICDS of the 4 Pilot Districts:

- **Implementation Strategy/ Innovation:**
  (i) Learning on the job experience, by supervising the 'Take-Home-Ration'. Delivery System for the 'Under 3s' and the P/ L women.
  (ii) The Adolescents will receive deworming and micronutrient tablet.(DHFW's will be responsible for the deworming)
  (iii) They would have the potential to become an ICDS Helper or Anganwadi Worker later on.

- **Baseline Assessment** and Pre-Post Evaluation will be done.

- **Type and Number of Beneficiaries:** 46,000 Adolescent girls in the 4 districts.
- **Time Frame:** January 1st, 2001 to January 1st, 2003.
- **Cost : Rs. 6 crores.** (Cost of Rs.1.38 crores for common drugs / RCH health/ Soap/ detergents/ etc. can be borne by the RCH Project of DHFW).

8.6. Pregnant/ Lactating Women:

- **Implementation Strategy/ Innovation:**

(i) Take Home Rations.
(ii) INHP Days
(iii) Mass Deworming (DHFW will synchronize, pay & implement)
(iv) Close Supervision by Adolescent Girls CCAs
(v) CCAs
(vi) Common Medicines (DH&FW) (DHFW will synchronize, pay and implement).

- **Baseline Assessment** and Pre –Post Surveys will be done.
- **Time Frame:** January 2001 to January 1st, 2003.
- **Type of Beneficiaries:** Very nearly 1,40,000 pregnant and lactating women beneficiaries in the ICDS Project of the 4 Study Districts.
- **Cost: Rs.23.20 crores.** (Cost to DHFW will be approximately Rs.2.8 crores at Rs.100/ woman beneficiary/ year x 2 years)

II. <u>Should be done in Collaboration with the concerned Department/s:</u>

8.7. Safe Water and Sanitation in all the AWCs in the 4 Pilot Districts.

- **The Strategy/ Innovation:**
  Apart from safe and clean water (atleast for drinking purposes) water is a fundamental and human right. It is also a vital and essential FOOD. Consequently, all the 7168 Anganwdis will be provided with 3 taps. One clean water tap for drinking and one for washing the ICDS utensils; and another (water need not be potable) for the toilet.
- **Baseline Assessment and Pre-Post Evaluation:** Will be done.
- **Time Frame:** January 1, 2001 to January 1, 2003.
- **Type of Beneficiaries:** Safe water will benefit **all** the beneficiaries who stay at the AWC more than 3 hrs a day, six days a week. The number of AWCs that will get the clean water + a toilet will be 7168 in the 4 Pilot Districts.
- **Cost:** A Capital cost of Rs. 10 crores – A Recurring cost of Rs.4 crores for the 2 years intervention. **Total of Rs. 14 crores.** The Concerned Department, that is, Sanitation and Sewerage will syncronize, implement and pay.

8.8. Deworming of all Vulnerable Groups of the Pilot Districts:

- **Strategy:** All the vulnerable groups in the ICDS, namely, the 'Under Threes', the 'Above Threes', the Pregnant and Lactating woman, and the Adolescent girl and the disadvantaged families, about 10 lakhs in **all** the AWCs in the 4 districts will be dewormed 2 times/ annum. Chappals will be sold at subsidized cost.

- **Baseline Assessment/ Pre-Post Evaluation:** Will be done.
- **Time Frame:** January 1st, 2001 to January 1st 2003.
- **Number and type of Beneficiaries:**
  All the enrolled beneficiaries in the 7168 AWCs in the Pilot Programme and the most disadvantaged families. The number will be approximately10 lakh beneficiaries.
- **Cost: Rs. 4 crores for 2 years intervention.**

8.9. A Multinutrient tablet including Iron, Folic Acid, Vitamin-C and Vitamin B-12 for all Pregnant/ Lactating Women in the ICDS of the Pilot Districts

- **Strategy/ Innovation:**
  The IFA tablet distribution has not been very successful. VitaminC is known to be the most powerful enhancer of Hb status. Hence, a micronutrient tablet, which would include Iron, Folic acid, Vitamin C and Vitamin B-12 needs to be developed.
- Pre-Post estimation of Hb status will be done.
- **Time Frame:** Two Years.
- **Type and Number of Beneficiaries:** All the Pregnant/ Lactating women enrolled in the ICDS. 1,40,000 + 46,000 = approximately 2 lakhs beneficiaries in all the 4 Pilot Districts.
- **Cost: About 1.5 crores.** (DWCD will synchronize, implement and pay.

8.10. Fortification of Double Toned Milk with VitaminA in Gulbarga, Raichur and Tumkur Districts for the Open Market.

- **Innovation/ Strategy:**
  The concerned dairies in the above three districts will fortify the **double toned milk, at the level of 10µg vitaminA per ml milk,** at their cost, for the **open market.**
- **Baseline Assessment** and Pre-Post Assessment will be done.
- **Time Frame:** Whenever they are ready to fortify the milk.
- **Number and Type of Beneficiaries:** All those families **who buy double toned milk** in Gulbarga, Raichur and Tumkur will benefit.
- **Cost:** About Rs. 3 crores (to be borne by the Dairies).

8.11. Enriching Ragi Atta with an Add-on of 6 Micro Nutrients in Tumkur District

- **Strategy/ Innovation:**
  Ragi is widely consumed in Tumkur District. Ragi flour will be supplied to the 2335 AWCs in Tumkur. An 'Add-On' Sachet of Iron, Ascorbic Acid, Riboflavin, Vitamin B-12 and Folic Acid, Vit A, which are the major micronutrient deficiencies in this district will be addressed. Each mother will receive 6kg ragi powder/ month in 2 lots of 3 kg each. She will also receive 30 sachets of the 'Add-On' of the micronutrients (also in 2 lots). She will be taught as to how to use the 'Add-On' at the **last stage** of making the Ragi Mudde or a Ragi kanjee. This strategy, hopefully, will empower the Pregnant/ Lactating woman to take care of her **own health.**
- **Baseline Assessment** and Pre Post Evaluation will be done.

- **Number and Type of Beneficiaries:** 31.000 Pregnant/ Lactating ICDS beneficiaries in Tumkur District.
- **Time Frame:** The start date will depend on the speed with which the tender is processed.
- **Cost: Rs.4.19 crores.** (DWCD will pay).

III. <u>Strategies that should be Seriously Considered by DWCD, DHFW & FPI:</u>

8.12 to 8.14: Other Strategies that should be considered seriously are:

8.12. Deworming + VitaminA+Iron+Iodised Salt for All Schoolers in the 4 Pilot Districts by DHFW.
8.13. Use of Double Fortified Salt in Chikmagalur District or Reputed Brands only. By FPI.
8.14. Drying Fruits/ Vegetables during their glut season by FPI.

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9. Approximate Total Budget Cost to DWCD/DHFW and other Departments for the 2-Year-Pilot Project

- To DWCD - Approximately Rs.90 crores.
  It may be noted that DWCD is already paying about Rs.70 crores for 2 years in the way of Food Supplement alone to its ICDS beneficiaries in just these 4 Pilot Districts.
- TO DHFW - Approximately Rs.20 crores.
- To Sanitation and Sewage - Approximately Rs.14 crores.
- To the 3 Dairies in Gulbarga, Raichur and Tumkur - Approximately Rs.3 crores.
- To FPI and other Departments/ Institutions - Cannot be budgeted at the present time.

The Total Budget is estimated to be **Rs.127 crores** for the Pilot Study of 2 Years duration.

PART ONE

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CHAPTER ONE: PURPOSE AND RATIONALE FOR THE PILOT STUDY

At a landmark meeting of the DWCD-Karnataka on 21st March, 2000, at Bangalore, Ms.Meera C.Sakesena, Secretary to Government, Women and Child Development Department, Government of Karnataka outlined the need for an Integrated Nutrition Project, as malnutrition including micronutrient malnutrition had still not come down to the desired levels as envisioned in the State's Plan of Action for 2000AD. DWCD would adopt the inter-generational life cycle approach wherein the most vulnerable and linked population segments would be the "Under Twos", the adolescent girls, pregnant and lactating women.

The importance of inter-sectoral coordination between DWCD and all other relevant departments was stressed by the Secretary DWCD-Karnataka. For the purpose of this Project Proposal inter-sectoral coordination between DWCD and DH&FW at all levels would have to be a pre-condition for a successful outcome of the Pilot. The other important net-working departments would be Agriculture (Food Production), Civil Supplies (PDS), Education (Primary and Secondary school levels), Food Processing Industries (Public and Private); and Information and Broadcasting (IEC) where inter-sectoral coordination, **especially at the District Level** could ensure the success of this Pilot-Project.

Mrs.Veena Rao, Jt.Secretary at DWCD, GOI succinctly brought up some important points as under:

- Women's groups in each of the 4 districts had to be identified, activated and empowered (to the extent possible) to make the cereal-pulse based supplement enriched or fortified with a vitamin-mineral-premix for the target groups.
- The **'Under Twos'** were the most vulnerable and undernourished population segment and should be treated as a special group.
- Appropriate **vitamin-mineral enriched food** supplements that could be **added onto** the cereal-pulse should be made/ devised for the **adolescent girl.** Likewise for the **Pregnant and Lactating women.**
- The Ministry of Food Processing Industries (FPI) had a scheme whereby capital and equipment grants to the tune of Rs.5 lakhs could be provided to these Women's Groups or Societies. This should be explored and utilized. FPI also had schemes to dehydrate and preserve fruits and vegetables in their glut season. If feasible, these should be incorporated into the food supplements.
- The widespread vitaminA deficiency in Karnataka had to be addressed and **children upto six-years of age** need to be covered for **vitaminA prophylaxis.**

It was proposed that a Pilot Integrated Nutrition Project be undertaken in all the ICDS Projects of Chikmagalur(7), Gulbarga (11), Raichur (5) and Tumkur (11) districts of the State from August 15, 2000. If this model is found to be promising and sustainable, it may be up-scaled to cover the whole state of Karnataka.

THE CONSEQUENCES FOR NOT TAKING IMMEDIATE ACTION

A Situational Analysis for Karnataka in general and for the four study districts in particular has clearly thrown up the following:

- **The adolescent girl** (15 to 18 plus years) consumes **much more** than she needs in the way of **local staples. Her consumption of pulses is less than adequate. But she is starved for her vitamins and minerals (micronutrients).**
- **The pregnant woman** also consumes what she requires of the **local staple/s. Her intake of pulses is lower** than what she needs. **Her need for vitamins and minerals is even more accentuated.**
- **The picture for the lactating woman** is similar to that of the pregnant woman.
- **It is the infant/ toddler/ preshcooler (1-5 years) who is literally starved for both his macro and micronutrients. Within this age group, the "Under Threes" in Karnataka, are in a precarious condition and need to be considered as a "Special Category" for urgent and immediate food and nutritional attention.**

The consequences of delaying or denying these vulnerable groups a fairly balanced diet now could be extremely serious. The outcomes are:

In the Under Threes:
- Growth faltering and failure which translates into a short and skinny adolescent/ adult.
- Negative effects of repeated episodes of diarrhoea and other childhood diseases/ ailments.
- Poor cognition/ poor physical work capacity (PWC) or productivity in later life.
- Clinical or sub-clinical nutritional deficiency diseases, especially, of Protein Energy Malnutrition (PEM) of iron, zinc, vitaminA, riboflavin, folic acid and vitaminC.

In the Adolescent:
- An undernourished adolescent will most probably be short and thin.
- She will most probably suffer from severe to moderate Iron Deficiency Anemia (IDA).
- She will have poor cognition, poor PWC and probably produce a Low Birth Weight (less than 2500g) baby when married.

The Pregnant Woman:
- IDA greatly increases the chances of maternal and neo-natal mortality.
- An underweight (<38kg) and/ or short (<145 cms) woman is definitely at Obstetric Risk. If the mother and infant survive, the infant is almost sure to be a LBW infant.
- Poor weight gain (3-5 kg) in a pregnancy leading to LBW.
- Early pregnancy (<18 years) stunts the young woman's own growth potential and ability to breast-feed and nurture her infant.

The Lactating Woman:
- An undernourished lactating woman can and does breast-feed her young one: this is nature's bounty. But she does this at the cost of her own body tissues and nutritional status – already perilously low.
- Maternal morbidity and fatigue make the mother **a poor 'care-giver' to her infant.**
- A vitaminA deficient lactating mother will have less of vitaminA in her milk.
- An iron-deficient lactating mother will become even more anemic; so will her infant.

Right Time for the Launch of the Said Pilot Project
- A committed political and bureaucratic will to even further improve the nutritional status of the vulnerable groups in the State of Karnataka.
- Generous funding by the Department of Woman and Child, GOI; MI; and UNICEF etc.

CHAPTER TWO : OVERALL AND SPECIFIC OBJECTIVES

The overall objectives would be to improve the nutritional status of the **vulnerable groups** in consonance with Karnataka's Specific Nutrition Goals for 2000AD. However, the maximum emphasis would be given to **improving the food supplement component** in the ICDS Projects of the four Pilot districts, for the 'Below Twos', the 'Under Threes', the older pre-schooler (3-6 years) the adolescent girl, the pregnant and lactating woman.

· Specific Immediate Objectives: (March 2000 to end June 2000)

(i) To **review** the recent, available and relevant literature on the nutrition profile of Karnataka in general and for the four Pilot districts of Chickmagalur, Gulbarga, Raichur and Tumkur with respect to food production, food security, food intake, food habits and taboos (with reference to the vulnerable groups), micronutrient deficiency disorders and their prevalence rates); ongoing nutrition and related programmes in operation; and Knowledge Attitude Practices (KAP) among the population.

(ii) To **propose implementation strategy/ ies** that would reduce undernutrition in the vulnerable groups in the ICDS projects of the four districts.

(iii) To suggest to the Government of Karnataka as to what the cost for the **improved food supplement/ ration/ beneficiary alone** would be for the 'Below One', 1-3 years, 3-6 years, the adolescent girl, the pregnant and lactating woman in the ICDS Projects, in consonance with the **proposed Strategies.**

(iv) On the basis of (i) and (ii) to outline population segments that require a strong **Awareness Programme** at State, District, ICDS Project Block and Community levels.

(v) To outline what the **linkages** at the District Level should be to benefit the Pilot Project.

(vi) To suggest a **Monitoring and Evaluation** format based on the proposed strategies.

(vii) To workout a Cost for an improved and fortified **SNP** for each of the four vulnerable groups. To give an estimate of **cost** for the strategy/ ies proposed.

Specific Short Term Objectives: (July 2000 to December 2000, 6 months)

(i) Fill-up all posts in the ICDS Projects of the Study Districts.

(ii) To set up a Programme Management Cell (PMC) to oversee the management of the project.

(iii) Start a strong **Awareness Programme for all levels** regarding the **Pilot Project** from January, 2001.

(iv) Have Self-Help-Groups in-place and train them to produce a SNP for the '3-6 years' age group.

(v) Orient/ Train/ Build Capacity in **all** implementing functionaries of the ICDS and Health Department.

(vi) Launch the Pilot as early as you can. (Hopefully by January 26th, 2001)

Specific Medium Term Objectives: (January 26, 2001 to January 26th 2003)

(i) Introduce the Interventions as shown under strategies.

Specific Long Term Objectives (February 2003 onwards):

(i) Expand or modify to suit the whole state of Karnataka.

(ii) If fairly successful and sustainable expand to other districts.

CHAPTER THREE:
3.1. THE PRESENT NUTRITION SITUATION IN THE 4 PILOT PROJECT PROGRAMME DISTRICTS: SOME BASIC DEMOGRAPHIC AND SOCIO-ECONOMIC INDICATORS IN THE 6 PROGRAMME DISTRICTS:

1. Demographic Indicators:

Karnataka's total population has been estimated to be 5.5 crores (55 million) in 2000. The most vulnerable groups in Karnatka for nutrition-health interventions would be the Under Fours especially the 'Under Twos'; the primary schoolers (both boys and girls); adolescent girls (10-19 Years) and the P & L woman. These groups alone would represent a large chunk of the base of Karnataka's Population Pyramid about 40% of the total population or about 2.2 crores.

	Age-Group	**% of Total Population**	
(i)	0-4 (F & M)	12	
(ii)	5-9 (F & M)	14	or 40% of total population
(iii)	10-14 (Female only)	6	
(iv)	15-19 (Female only)	5	
(v)	Pregnant Woman	2	or about **2.20 crores**
(vi)	Lactating Woman	4	

If one assumes that 40% of the above **2.20 crores** were below the poverty line, the target population would still be 88 lakhs who would or should be the target population for **Nutrition and Health Interventions.** If one considers that these population segments would **need both their macro and micro nutrient food supplementation day-in and day-out, even at a minimum Rs. 2/ subject/ day, the food supplementation bill alone would amount to Rs.642 crores/ annum for the whole state.** The bill for the **food supplement alone** in all the ICDS projects of 4 pilot districts is estimated to be about Rs.70 crores for the 2 year Pilot Programme.

2. Some Socio-Economic Indicators that could influence the Nutritional Status of the Vulnerable Groups

In 2000 AD, it is heartening to note that 88% are involved in decisions about cooking; 49% about their own health-care; 43% have freedom of movement (going to the market etc); 67% are permitted to have some money to spend. In the age-group (15-24 years) **more than half** exercise this autonomy.

Figure 1, depicts that 52% are sterilized; another 15% **do not** want anymore children. Female sterilization is the **most favoured** method of birth control.

Table 1, shows that Karnataka is still a 'young-in-age' state like almost all other states in India. About 50% are under the age of 24. Girls getting married young (15^{+} years is still the norm) Female and male illiteracy are still unacceptably high at 45% and 26% respectively.

The NHFS-2 Preliminary Report also states that 52% of the women are doing work other than house work. The figure is 63% in Rural and 31% in Urban Areas.

Figure 2, heightens the fact that age-specific fertility peaks from **15+ to 24 years.** This is the age-group that requires maximum assistance to curb their family size, to exercise autonomy in 'rearing and caring' for their young-ones, and to 'care for themselves' as well.

The same reports NFHS-2 Preliminary Report, also indicates that RCH services are **well above average,** with well over 70% receiving 2 or more doses of tetanus toxoid and IFA tablets/ syrup.

3. Food Security and Agriculture:

Eighty percent of Karnataka's population is engaged in agriculture. Rice is grown in the coastal areas. Next to rice are jowar and ragi. The main cash crop is sugar cane. Plantation crops are tea, coffee, cashew, cardamom and horticulture. Cereals and pulse crops by and large dominate the agricultural scene. NNMB has so far done 3 rounds of Food and Dietary Intake Surveys in Karnataka. The first round was done in 1975-79; the second repeat round in 1988-90; and the third repeat round in 1996-1997.

There were no significant differences in average food consumption between the First and Second rounds. However, there are some differences with respect to intake of food stuffs between Round Two (1989-90) and the repeat Round Three (1996-97). Intake of Pulses/ Legumes is **noticeably low;** milk is marginally **down;** and **fats** and **oil** in **noticeably up.**

4. Consumption of cereals (including millets), pulses, nuts and oil seeds in the Project Districts of Karnataka

On the face of it neither the Urban nor the Rural Karnatakan is lacking in either calories or protein. However if we look at the poorest expenditure class (Rs 120/cu/month for the rural and Rs.185-215/cu/ month for the Urban), we see a very different picture ***(Table 4).*** The cheapest millets namely, Jowar and Ragi are consumed with much less of rice by the Rural poor. Cereal and pulse intake is well below RDA. The situation is much worse with respect to our vulnerable groups, especially the 'Under Fours', who are in a virtual state of starvation for both their macro as well as micronutirents. In the Urban poor the pattern is rice, jowar and much less ragi. Extremely inadequate amounts of milk, oils, meat, fish or eggs are consumed ***(Table 2).***

District Cereal preferences are important to remember when formulating RTE food supplements for our vulnerable groups at the District or Block or Village levels. Again and again data show that the poor just **cannot afford** expensive items of diet such as milk, oils, flesh foods, fruits and vegetables which are the natural food sources of vitamins and minerals. Hence, they have to be supplied either through the route of **medicinal supplementation and/ or through fortification/ enrichment of those items of food that can reach the poor through the PDS. These would be fats/ oils, sugar, cereals and flours (ragi atta for the urbanites)**

Nutritional Consequences of poor Grain Storage:

Since a predominant portion of the Karnatakan's diet comes from grains it is important to know the nutritional consequences of poor storage and attempt to address this problem when we come to strategies.

A major problem today with respect to cereals and pulses are poor storage conditions at the point of harvesting. About half a century ago **very low doses of** irradiation of harvest crops from grains to strawberries at the place of harvesting has saved many a crop from further loss upto the market place. But India and Indians appear to be wary of any innovation. Lack of both time and open spaces for storing food grains especially rice is major problem. The paddy crop is harvested at 20 – 22% moisture levels when it should be dried and stored at 13% level. We urgently need **drying or storage structures** to avoid loss of precious grains. The outcomes of poor storage (high moisture levels) results in not only an organoleptically inferior grain, but also a high risk of mould, fungi and

mycotoxins. Insects thrive on wet grain, consume the most nutritious germ and excrete uric acid. Fecal matter or body debris makes the grain far less palatable. Rats are also a menace when they get into godowns where the grains are stored. The **CFTRI came out with simple storage bins on stilts, which prevents rodent's atleast from getting into the primary storage containers. These are the kind of simple innovations that we need.** After 9 months of farm storage substantial losses in the nutritive value of the grain have been reported, especially in the Protein Efficiency Ratio (PER) or quality of Jowar which drops from 2.0 to only 0.35, chickpeas from 2.21 to 1.83 and pigeon peas from 2.04 to 1.66. Vitamin losses after 5 months of storage were 13-25% for thiamine (Vitamin B1), 7-11% for riboflavin (Vitamin B2) and 7-14% for niacin. We need to go back to time-tested but improved methods of storing paddy in a ***kanaja,*** Jhola (sorghum) in a *hagevu* with *neem* leaves or *mehandi* leaves which have a charecterstic repulsive smell and which keeps the invading insects at bay. Ragi, fortunately slippery and is not prone to insect attack. In fact **a thick layer of ragi grain is often placed on top of other grains such as Jhola or Rice as a protectant.** Such simple practices should be highlighted in the envisaged IEC of this pilot-project at **every level.**

Pulses: The main pulse market of Karnataka is Gulbarga, one of our programme districts. Imports of pulses come in from Maharashtra and MP. The important pulses are cowpea (*karamani*), black gram, red gram *kadalai, aware* and *tur.* Green gram is grown in the fallow moisture after the paddy crop has been harvested. Cow pea or Karamani is a hardy crop and widely used pulse among the rural and farming households. Tur and Thuvar dal is grown as a mixed-crop with ragi in Gulbarga and Raichur. Horsegram or *kollu* is popular in Bangalore. Hence, it would be quite easy to set up small food-processing units for Self-Help-Groups to operate and market **or sell back to the ICDS.**

Karnataka now produces 60% or more of the State's requirements of pulse. This is due to better **knowledge of storage, more hardy strains, higher productivity and the use of protectants.**

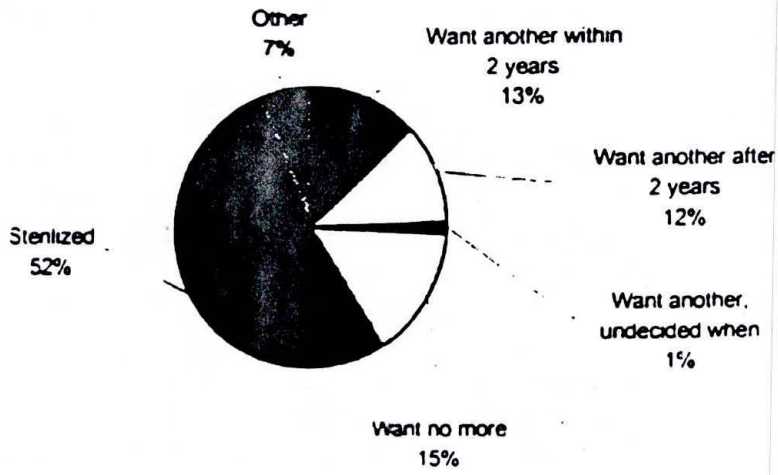
The latest announced target for staples, pulses, oilseeds in May, 2000, is **higher than last year's target.** It is about 93 lakh tonnes for rice, maize, jowar and ragi. The remaining 7 lakh tonnes are the target for pulses. Groundnut takes pride of place (about 12 lakh tonnes) among oil seeds.

Milk: Karnataka is again fortunate in that 14 of its districts have milk handled by dairies. The biggest dairies are in Bangalore followed by Kolar, Tumkur, Gulbara and Raichur have milk dairies ***(Table 3).*** Unfortunately, the per capita consumption of milk is poor (30 to 140 ml/ person per day) in the lowest and even mid-level expenditure classes. **However, one way of reaching out to the needy is to sell toned milk enriched with all the fat-soluble vitamins (A,D,E and K) at subsidized rates. This has been done successfully by the NDDB in Gujarat and UT of Delhi.** We should try and make it the birth right of every needy child in the age-group of 1-5 years to get atleast 250 ml (quarter litre) of such a product at Rs.2/ packet. **Even poor parents will buy provided the product is available, affordable, accessible and appropriate (enriched with vitamins).** This with two slices of bread (enriched with all the water-soluble vitamins and essential minerals like iron and zinc) would be a far better supplementary food for children in Urban Conglomerations. It is also more likely that the child will get his meal at home also. The fortified milk and bread combination would be viewed as a **snack** and not as a **meal** as judged by the experience of the free Municipal Schools in Baroda.

Oils and Fats: The intake of oils and fats is surprisingly low at 8g and 14g per person per day in the lowest and mid-rung expenditure classes. Inspite of this low-intake, I would urge the Government of Karnataka to either enrich the palmolein (distributed in the PDS) with red-palm-oil or with Vitamin A palmitate. **Karnatakans-man, woman and child – are most deficient in Vitamin A.**

Figure 1

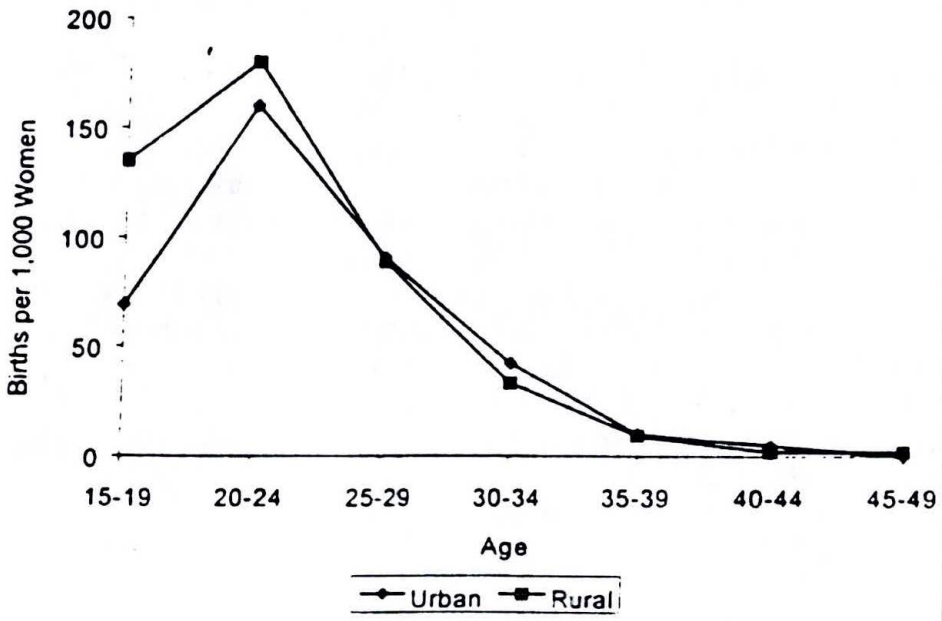
Fertility Preferences Among Currently Married Women Age 15-49



NFHS-2, Karnataka, 1999

Figure 2

Age-specific Fertility Rates by Residence



Note: Rates are for the three years preceding the survey

NFHS-2, Karnataka, 1999

Table 8 Women's autonomy

Percentage of ever-married women involved in household decisionmaking, percentage of women with freedom of movement and percentage of women with access to money by background characteristics, Karnataka, 1999

Background characteristic	Percentage not involved in any decision-making	Percentage involved in decisionmaking about:				Percentage who do not need permission to:		Percentage with access to money	Number of women
		Cooking	Own health care	Purchase of jewellery, etc.	Staying with parents/ siblings	Go to the market	Visit friends/ relatives		
Age									
15-19	20.7	70.5	35.1	35.4	35.3	26.1	21.4	46.6	427
20-24	13.6	81.4	38.9	36.4	35.2	34.4	28.3	62.3	777
25-29	7.9	88.8	46.5	44.5	42.3	41.0	32.7	67.1	863
30-34	5.4	92.6	52.5	48.6	45.2	45.1	32.7	68.7	721
35-39	4.4	93.7	57.1	55.9	52.0	48.6	39.6	72.0	631
40-44	1.9	96.0	59.4	57.7	52.5	54.8	46.6	75.8	534
45-49	3.8	93.7	58.2	56.8	52.5	53.5	41.6	74.4	419
Residence									
Urban	6.9	89.1	55.5	54.4	50.7	52.9	41.2	79.5	1.523
Rural	8.8	88.1	45.9	43.5	41.1	37.7	30.7	60.3	2.851
Employment status									
Working in family farm/business	10.3	86.5	49.0	46.8	43.0	39.4	33.8	60.4	726
Employed by someone else	6.1	90.7	49.3	48.4	45.8	41.3	33.7	63.4	1.296
Self-employed	4.3	91.3	59.0	56.3	57.1	54.3	44.6	80.4	254
Not worked in last 12 months	9.1	87.3	48.1	45.6	42.6	43.9	33.7	69.9	2.097
Education									
Illiterate	8.0	89.3	45.7	44.0	40.9	38.6	31.3	59.9	2.414
Lit. < middle school complete	6.8	89.5	52.3	48.6	45.7	41.7	32.4	68.3	818
Middle school complete	11.1	84.5	52.1	50.3	47.1	45.9	32.7	72.9	289
High school complete and above	8.9	86.1	55.4	54.3	52.4	55.7	45.3	83.7	853
Religion									
Hindu	8.1	88.4	49.7	47.2	44.4	44.6	35.4	66.9	3.741
Muslim	9.2	87.3	42.3	44.5	40.9	26.7	23.1	62.0	492
Sikh	4.8	91.3	60.3	57.9	59.2	56.7	43.4	86.5	105
Other	(6.0)	(91.1)	(68.9)	(62.9)	(56.9)	(57.6)	(54.7)	(83.2)	35
Caste/tribe									
Scheduled caste	8.4	88.9	43.4	43.2	39.5	38.7	32.3	64.4	704
Scheduled tribe	7.1	88.6	46.6	43.9	42.7	46.2	35.4	53.8	252
Other backward class	7.4	89.2	52.9	49.8	47.2	45.1	35.0	67.9	1.809
Other[1]	8.8	87.6	48.4	46.9	44.2	42.1	34.4	69.7	1.559
Missing	(18.2)	(75.8)	(38.6)	(40.5)	(34.4)	(38.4)	(34.4)	(54.7)	49
Total	8.1	88.4	49.3	47.3	44.5	43.0	34.3	67.0	4.374

Note: Total includes 1 woman with missing information on employment status, who is not shown separately.
( ) Based on 25-49 unweighted cases
[1]Women who do not belong to a scheduled caste, a scheduled tribe, or an other backward class. NHFS-2, Karnataka, 1999

Table 2 : Consumption of Cereals/ Millets/ Pulses/ and other food items by the poorest expenditure class (Rs.12,000/ annum/ family) in 2000 in Karnataka per month

Expenditure Class	Consumption in Kg/ cu/ 30 days									
	Rice	Wheat	Jowar	Bajra	Ragi	Total (Cereals)	Total (Pulses)	Milk (litres)	Oils (kg)	Flesh Foods (kg)
Rural (Rs.125-140)	6.10	0.65	3.51	0.48	3.02	14.13	0.82	2.49	0.24	0.88
Urban (Rs.185-215)	6.09	1.60	2.51	0.00	1.22	11.59	1.00	4.20	0.42	1.21

Source : NSS Survey – Sarvekshasna, July – September 1991.

Notes :

(i) A Rural family of 6 members x Rs.140 x 12 months = Rs.10080 (below Poverty Line)

(ii) A Urban family of 6 members x Rs.215 x 12 months = Rs.15480 (borderline of Poverty)

(iii) In both Urban and Rural Sector milk is the **best vehicle** to fortify with mandatory levels of Vitamin A, D and E. PDS Wheat flour can be enriched with the B-Complex vitamins, iron, zinc and vitamin C (?). May be ragi flour in U Sectors (?)

Table 3 : Milk Handled by Dairies in three Project Districts (Lakh Litres)

Location of the Dairy	1989-90
1. Tumkur	333
2. Gulbarga	78
3. Raichur	79

Source : Statistical Outline of Karnataka (1989-90)

3.2. DIETARY INTKAE PATTERN NUTRITIONAL PROFILE OF THE VULNERABLE GROUPS IN KARNATAKA

1. **Introduction:** The Nutrition Profile of Karnataka, 1996; The National Family Health Survey, 1999; the National Nutrition Monitoring Bureau (NNMB) Surveys of 1988-90 and 1996-97; Dietary Guidelines for Indians-A Manual, 1998; and the Indian Council of Medical Research (ICMR) Expert's Group Report on the Nutrient Requirements and Recommended Dietary Allowances for Indians, 1992 (unchanged upto 2000) – have been the main reference source for this section.

   The study districts selected in the Nutrition Profile of Karnataka were Gulbarga, Uttar Kannada, Chitradurga, Tumkur and Mysore giving a good geographic representation in the State. Adequate representation was given to Rural, Urban and Tribal populations. The vulnerable groups selected in the Nutrition Profile were the 'Under Threes', the 'Above 3s', the late adolescent girls (15^{+} to 18^{+} years) and the pregnant and lactating woman. Gulbarga and Tumkur are our Pilot districts. Though four years old, we found this report the most **location specific and useful.**

2. **Dietary Profile (Intake of Food Stuffs by Women and children)**
   Tables 4,5,6,7 and 8 set out the average intake of foodstuffs by the vulnerable groups in the Pilot Study. Data have been presented from the 1996 (Nutrition Profile of Karnataka) and the latest NNMB-repeat survey (1999) VS the latest ICMR-Recommended Daily Allowances. The arrows (↑,↓ or ok) indicate the food intake position VS the RDA.

   One can see at a glance, that most of the arrows are downwards, indicating that the RDA for most food groups in any vulnerable segment of the population – IS NOT MET. It is **particularly bad** with respect to the protective groups such as green leafy vegetables (GLVs), milk, fruit, other vegetables and fleshy foods// fish which are non-affordable by the Low or even the Middle income groups at present day prices. These protective foods are the natural **dietary sources of vitamins, minerals and trace elements for the human being.**

   Women / Adolescent Girls:
   It is important to note that the average intake of **cereals** in the adolescent girl is more than the RDA. Pulse consumption is down in the 1999 data. Comparatively speaking, the adolescent girl **eats better than the child,** and is able to **appease her raw hunger** (cereals, pulses, other vegetables, roots/ tubers, fats/ oils, sugar/ jaggery).

   The Infant and the child (1-3 years and 4-6 years):
   ***Table 4*, depicts that it is Karnataka's child (1-3 years of age) that is in a chronic state of starvation for all the dietary items- macro to micro. The starvation picture was even more magnified for the age group of 1-2 years *(Table 5).* This age group of (1-3 years); above all needs to be treated as a special group. All attempts should be made to address the problem through a strong and continued IEC for the community and parents. Also by more effective enrolment, coverage and participation of this helpless age group.**
   The Dietary Guidelines for Indians (1998) strongly recommends that children in this age group should get an additional 200ml of milk even in the breast fed children.

   The Dietary Intake of the Pregnant/ Lactating Woman:

   Pregnant Woman:
   Whether one accepts the 1996 or 1999 figures, both show that the pregnant woman get **far less in every food category, except for the staple cereal/s. The deficits in all other categories of foodstuffs are alarming *(Table 6).***

The Lactating Woman:

The picture is very similar for the lactating woman – only even more heightened *(Table 7).*

3. **The Nutrient Intake Profile of the Infant, the Child, the Adolescent Girl, the Pregnant and Lactating Woman**

The Infant (1-2 years):
(Table 8) depicts the **nutrient plight** of this child. On an average the calorie gap is 616 kcal; the protein gap is 10g; the calcium gap is about 160 mg; the iron gap is 7 mg; the vitaminA gap is 180 µg; no gap where the β-Complex vitamins are concerned; a big gap of 5 mg in the case of niacin; and a huge gap of 33 mg with respect to vitaminC. The picture is similar but slightly better for the 2-3 years old.

The Child (4-6 year):
The 1999 (NNMB) figures do show a slightly better average nutrient intake in both the 1-3 and the 4-6 year age groups. Again whichever data set is accepted (1996 or 1999): wide nutrient deficits persist for calcium, iron, vitaminA, niacin and vitaminC *(Table 9).*

The Adolescent Girl (15 to 18^{+} years):
The only group that is overeating with respect to food energy, protein and calcium are the adolescent girls (15 – 18^{+} years). Glaring deficits continues for vitaminA. Although the dietary iron intake at about 25mg VS the RDA of 30mg appears to be fairly adequate – it is well known that very little will be available from a predominately cereal-based-diet *(Table 9).*

The Pregnant Woman:
Data were available for nutrient intake only from the NNMB Repeat Survey of 1999. We have considered the Pregnant and Lactating Woman to be in the Moderate Worker Category. The Pregnant Woman needs practically much more of **every nutrient – both macro and micro** *(Table 10).*

The Lactating woman:
The picture is very similar, **only worse** *(Table 10).*

In sum, the situational analysis shows that it is unlikely that a change in the dietary pattern of these vulnerable groups can be brought about by **just IEC alone, however excellent.**

There is a clear need to:

- Consider the 6 months to 36 months old child as a **special category.** She/ he needs a huge supplement to bridge both his macro and micro food nutrient requirements. In fact an improved and enriched double-ration may partially solve the problem in the ICDS.
- The adolescent girl needs immediate **medicinal supplementation, namely a multi-vitamin and mineral tablet. Protective foods were unaffordable. The Pregnant and Lactating Woman needs both macro and micro nutriet supplementation like the child category.**
- It could well be that IDA is being caused by a large deficit of vitaminC in the diet (most powerful enhancer of iron). Hence, a powder drink, enriched with vitaminC and as many other vitamins/ minerals, which can be reconstituted with water to make a refreshing drink may be tried to address the **IDA problem** in the adolescent girl, Pregnant and Lactating woman.

Table 4: Average intake of food stuffs by Adolescents Girls and Children and comparison with RDA (for all 5 districts)

(All values in grams)

Age	1-3 Years			4-6 Years			16-17 Years		
	1996	**1999**	**RDA**	**1996**	**1999**	**RDA**	**1996**	**1999**	**RDA**
No. Covered	1478	1353		1108	1265		75	201	
Cereals	161↓	152↓	**175**	257ok	243↓	**270**	606↑	467↑	**440**
Pulses	12↓	13↓	**35**	19↓	20↓	**35**	42ok	29↓	**45**
Leafy Veg.	5↓	5↓	**40**	7↓	10↓	**50**	19↓	16↓	**100**
Other Veg.	5↓	14↓	**20**	7↓	25↓	**50**	26↓	55↑	**40**
Roots/ Tubers	6↓	16↑	**10**	9↓	28↑	**20**	10↓	54↓	**50**
Oil & Fats	2↓	4↓	**15**	3↓	6↓	**25**	4↓	20ok	**25**
Milk	15↓	66↓	**300**	17↓	59↓	**250**	21↓	75↓	**150**
Sugar/ Jaggery	10↓	15↓	**30**	13↓	17↓	**40**	20ok	20ok	**20**
Fruit	8↓	14↓	-	10↓	22↓	-	18↓	26↓	-
Fish	2	5 ↓	-	3 ↓	7 ↓	-	5 ↓	23 ↓	-
Fleshy Foods	2	2	-	2	2	-	1	5	-

Source: Nutrition Profile of Karnataka (1996); and the NNMB (1996) and the NNMB Repeat Survey (1999). RDA, ICMR, 1992 – continuing.

Table 5: Average intake of food stuffs by the Infant and comparison with RDA (for all 5 districts)

(All values in grams)

Age	1-2 Years	RDA
Cereals	116 ↓	175
Pulses	9 ↓	35
Leafy Veg.	3 ↓	40
Other Veg.	3 ↓	20
Roots/ Tubers	5 ↓	10
Oil & Fats	1 ↓	15
Milk	15 ↓	300
Sugar/ Jaggery	7 ↓	30
Fruit	6 ↓	100
Fish	2	50
Fleshy Foods	1	-

Source: Nutrition Profile of Karnataka (1996)
RDA, ICMR, 1992

Table 6 : Average intake of food stuffs during pregnancy

(All values in grams)

	1996				1999
Districts	**Gulbarga (R)**	**Tumkur (U)**	**Average**	**RDA**	**All Karnataka (R)**
No. Covered	45	45			**128**
Cereals	634 ↑	519 ↑	**577** ↑	*475*	**460** ↓
Pulses	47 ↓	26 ↓	**37** ↓	*60*	**30** ↓
Leafy Veg.	6 ↓	19 ↓	**13** ↓	*100*	**16** ↓
Other Veg.	19 ↓	10 ↓	**15** ↓	*40*	**42** ok
Roots/ Tubers	6 ↓	22 ↓	**14** ↓	*50*	**33** ↓
Oil & Fats	6 ↓	8 ↓	**7** ↓	*25*	**12** ↓
Milk	16 ↓	20 ↓	**18** ↓	*250*	**65** ↓
Sugar/ Jaggery	16 ↓	21 ↓	**19** ↓	*30*	**15** ↓
Fruit	14 ↓	32 ↓	**23** ↓	*100*	**26** ↓
Fish	0	0	**0** ↓	*100*	**8** ↓
Fleshy Foods	-	11	**11** ↓		**6** ↓

Source: Nutrition Profile of Karnataka (1996); and the NNMB repeat survey, 1999.

Table 9 : Average Nutrient Intakes of Adolescent Girls & Children (all 5 districts pooled) along with RDA

Age in years	1-3 Years			4-6 Years			16-17 Years		
	1996	1999	RDA	1996	1999	RDA	1996	1999	RDA
Number	1478	1353		1108	1265		75	201	
Calories (K.Cals)	700 ↓	807↓	1125	1098 ↓	1213 ↓	1600	2369		2050
Protein (Gms)	18 ↓	21 ok	23	29 ↓	31ok	31	65 ↑	52 ok	50
Calcium (Mg)	205 ↓	239 ↓	400	295↓	298 ↓	400	661 ↑	525 ok	500
Iron (Mg)	7 ↓	9 ↓	12	12 ↓	14 ↓	18	24 ↓	23 ↓	30
VitaminA (ug)	78 ↓	133 ↓	400	108 ↓	205 ↓	400	265↓	249 ↓	6010
Thiamin (Mg)	0.4 ↓	0.4 ↓	0.6	0.7 ok	0.7 ok	0.8	2 ↑	1 ↓	1.1
Riboflavin (Mg)	0.6 ↓	0.4 ↓	0.7	1.0 ok	0.6 ↓	1.0	2 ↑	.9 ↓	1.2
Niacin (Mg)	4 ↓	5 ↓	7	7 ok	7 ok	11	17 ↑	12 ↓	14
Vitamin C (Mg)	9 ↓	15 ↓	40	13 ↓	25 ↓	40	30	40 ok	40

Source : Nutrition Profile of Karnataka (1996); Repeat Survey (1999)
RDA. ICMR, 1992

Table 10: Intake of Nutrients (per day) of Adult Females by Physiological and Activity Status

Physiological Status	Pregnant Woman		Lactating Woman	
	1999	**RDA**	**1999**	**RDA**
Calories (K.Cals)	2137 ↓	2525	2396 ↓	2775
Protein (Gms)	53 ↓	65	60 ↓	75
Calcium (Mg)	409 ↓	1000	430 ↓	1000
Iron (Mg)	27 ↓	38	28 ↓	30
VitaminA (ug)	291 ↓	600	269 ↓	950
Thiamin (Mg)	1 ↓	1.3	1.4 ok	1.4
Riboflavin (Mg)	.8 ↓	1.5	1.0 ↓	1.6
Niacin (Mg)	15 ↓	60	15↓	18
Vitamin C (Mg)	35 ↓	40	36 ↓	80
Folic Acid (µg)	143 ↓	400	168 ↑	150

Source : Repeat Survey – NNMB (1999)
RDA. ICMR 1992

3.3. NUTRITIONAL STATUS OF THE VULNERABLE GROUPS (WOMEN AND CHILDREN OF 0-5 YEARS)

1. **Mean Weight and Height of the Women (15-45 years of age)**
   Table 11 & 12 show that the women in all the districts were light and short. Women in Mysore (Tribal) were decidedly lighter and shorter than their counterparts in the other districts. Women (20+ years) were the tallest in Tumkur (Slums). Inspite of Uttar Kannada being the most prosperous among the rural areas, women were the shortest here.

2. **Women at Obstetric Risk by Weight and Height Indicators :**
   Poor height (145 cms or less) and poor weight (less than 38 kgs) are indicators of obstetric risk. ***Table 13*** shows, that nearly 30% of the women surveyed were at obstetric risk by the weight parameter. Twenty one% were at risk by the height parameter. When both parameters were considered, the Obstetric Risk Factor ranged from 7% in Tumkur to a high 19% in Uttar Kannada; Overall the risk was 13%. The tribal women were the lightest and demonstrated an Obstetric Risk (by Weight) of 48%; in Gulbarga it was 28% and in Tumkur it was 19%.

3. **Body Mass Index (BMI) of the women (15 to 44 years of age)**
   Table 14, demonstrates the poor anthropometric status of women (15-44 years) in all the five study districts.
   Body Mass Index (BMI) is an useful indicator to assess nutritional status. It is defined as weight (kg)/ height $(cm)^2$. Persons with a BMI of less than 18.5 are considered to be undernourished and to be suffering from Chronic Energy Deficiency (CED). As per this criterion only 42% in Gulbarga, 48% in Chitradurga, 40% in Uttar Kannada, 19% in Mysore, and 50% in Tumkur could be classified as having a normal BMI.
   This again points to the fact that although the adolescent girls/ women consumed **more than their RDA in food energy and protein, yet, their nutritional status was poor. A diet has to be fairly balanced in order that fairly normal growth occurs.**

Clinical Signs of Poor Nutritional Status in the Women (15-45 yeas)

Table 15, shows that clinical signs of Nutritional Anemia as judged by pallor and pale nails was over 30% in 4 districts; it was as high as 44% in Tribal Mysore. Mottled teeth, a sure sigh of flourosis (high fluorine content in water) was as high as 9% in Gulbarga. It appears to be a rural problem and was 6% for the pooled data of 3 districts (R). Iodine Deficiency Disorders is becoming an endemic problem in Karnataka and ranged from 13 to 26% in the five study districts. Tribal Mysore was the most affected with respect to IDD.

Biochemical Indicator for Nutritional Anemia :
Tables 16 & 17 and Fig. 3 clearly sets out the nutritional anemia or IDA scenario in 1999. Hb values were obtained by the finger prick or heel prick and direct HemoCue method. The latest data (2000) show that in women (15-24 years of age group), IDA is about 50%. Rural women tend to be more anemic than their Urban counterparts.

Pregnant/ Lactating Women:
IDA has come down in the Pregnant and Lactating Women (49% and 45% respectively). It is not very different from the prevalence figures given for women overall (42%). But the Pregnant woman usually suffers from Moderate anemia, while in the non-pregnant it is usually Mild.

Fig. 3 shows that the child 1-3 years is the more affected than the Pregnant / Lactating group with a **prevalence of 66%. The most affected group is the 1-2 year age group (78%).**

In Sum:

- **These disadvantaged women need a much more balanced diet. In short they need much more vitaminA. folic acid, riboflavin and vitamin C in their diet.**
- **Ante-natal care has to be improved everywhere.**
- **The consequences of great obstetric risk to mother and child have to be emphasized at all levels in IEC.**
- **Nutritional anemia is almost universal and has to be tackled on a war footing.**
- **Iodine Deficiency Disorder is becoming endemic inspite of iodized salt being freely available.**

Mean Weights and Heights of Children (0-5 Years) in Karnataka

1. **Underweight of Children (1-5 years) ;**
   Fig 3 reproduced from the NFHS Survey (1992-'93) clearly demonstrates the plight of infants and preschoolers in the age groups of 6> months to 47> months in Karnataka. Until 6 months of age, the infants are totally on breast-milk. Thereafter, the mother's milk sharply diminishes although the pattern is to breastfeed upto 2 years of age. The child is abruptly weaned onto the home-diet almost always the cooked staple of the region. This is totally **inappropriate** for the infant. Almost all families are becoming nuclear with at most a widowed father/ mother who lives-in. The gravity of the weight deficits is setout in ***Table 18.*** To give an example an infant boy between 1-2 years of age should weight **13.2kg** (NCHS std), whereas he weighs only about **10.5 kg.** In the case of baby girl the NCHS std is **12.6kg** Vs **10kg.** These weight for age deficits are **totally unacceptable** and need immediate attention. Karnataka households, by and large, have an adequate amount of cereals. Why then this anomaly or enigma? ***Table 1*** of section 3.1 and 3.2 highlights the chronic starvation levels of infants in the age group of 6-12 months.

2. **Undernutrition in terms of Stunted/ Underweight or Wasted Children:**
   Fig.4 further accentuates the fact that overall 54% of our children are underweight, 48% are stunted or short for their age; and 17% are wasted or emaciated. Our first priority is to try and improve this unhappy state of affairs in our Pilot Project.

3. **Height Details of Children (0-5 Years) in Karnataka:**
   Table 19. Our babies and pre-schoolers are not only light but also quite a bit shorter than their privileged counterparts (NCHS) at any age. To take an example the height difference for the 1-2 years olds, is 11cms for boys; and 11.4cms in the case of girls. What is worse is that the deficit **widens with age.**

4. **Clinical Signs of Nutritional Deficiency in Children (1-5 years) in Karnataka PEM (Protein Energy Malnutrition** ***(Table 20)***
   The florid signs of PEM (Protein Energy Malnutrition), namely sparse and discoloured hair, odema and marasmus (skin and bones) etc has virtually been eliminated. However, emaciation in the Rural areas especially in Gulbarga (13%) has not.

Vitamin B-Complex Deficiencies:
Angular Stomatitis (Vitamin-B2 or riboflavin deficiency) is definitely a public health problem in the Rural Karnataka preschoolers (4%) especially in Gulbarga (6%).

Vitamin A deficiency:
Night blindness (cannot see after sunset) and/or Bitot's spots are also a Public Health Problem in the Rural preschoolers (0.9%) Vs the WHO cut-off 0.5% to be considered so. Again **Gulbarga** pre schoolers are the most affected (2%)

Iron Deficiency Anemia (IDA):
The clinical signs of IDA were high, ranging from more than 17 to 30% for pallor and a few cases of koilnychia (concave finger nails). This was confirmed by the fact that only less than half had Hb levels of 11g/ dl or more (WHO cut-off for children) by the Cynmethamoglobin Method ***(Table 16).***

Flourosis: The pooled data for the Rural pooled was 5% (again a Public Health Problem), with U.Kannada (9%), and Gulbarga (5%) being the most affected.

Iodine Deficiency Disorders (IDD):
Our children below 5 years of age were not very affected (about 0.5%). It is the schoolers and adults who manifested a very high prevalence of IDD (Please refer ***Table 21).*** Chikmagalur was the most affected (41%) followed by Gulbarga (5%).

In Sum:

- **Our child in Karnataka is both famished for his macro (calories and protein) as well as his micronutrients (vitamins & minerals). He has to have both in a fairly balanced manner, everyday of his life if he is to live let alone grow.**
- **One has to investigate why the LIG families give their children (1-5 years) such minute amounts of even the cereals/ pulses, which the adults (including adolescent girls) eat to more or less satisfy their RDA for food energy.**
- **All the vulnerable groups envisaged in the Pilot Project, namely, Adolescent Girl, the Pregnant and Lactating Woman and the 'Below Fives' desperately need protective foods and/ or micronutrients, which supply the vitamins/ minerals.**
- **The most nutritional at risk group is the 6-48 months age group. Of these the 'Under Twos' are a special category as they have other problems such as swallowing reflex and less saliva to moisten and partially liquefy solid food in the mouth itself. They need high nutrient density but liquidy foods. Hence, the addition of amylase is essential.**
- **The micronutrient needs include vitaminA, vitamins of the B complex especially riboflavin (B-2), bio-available iron and iodine. Also vitaminC (an enhancer of iron).**

Table 11 : Mean Heights of Women in different districts

District	Gulbarga (R)	Chitradurga (R)	U.Kannada (R)	Pooled	Mysore (T)	Tumkur (U)	Pooled (All 5 dists.)	
Age in years	Mean Ht.	Mean Ht.	Mean Ht.	Mean Ht.	Mean Ht.	Mean Ht.	No. covered	Mean Ht.
15-19	149.0	149.2	148.2	149.5	150.3	149.3	99	149.6
20-24	149.7	151.0	149.1	150.0	150.4	152.1	614	150.6
25-29	149.8	151.8	150.1	150.6	150.5	151.7	736	150.8
30-34	151.6	151.5	149.5	150.8	150.5	151.7	387	150.8
35-40	151.0	150.7	148.6	150.1	148.9	151.5	152	150.1
40-44	148.5	145.1	149.8	148.5	150.4	152.9	30	149.3

Source : Nutrition Profile of Karnataka (1996). R = Rural ; T = Tribal; U = Urban

Table 12 : Mean Weights of Women in different districts

District	Gulbarga (R)	Chitradurga (R)	U.Kannada (R)	Pooled	Mysore (T)	Tumkur (U)	Pooled (All 5 districts)	
Age in years	Mean Wt.	Mean Wt.	Mean Wt.	Mean Wt.	Mean Wt.	Mean Wt.	No. Covered	Mean Wt.
15-19	42.5	41.2	36.6	41.8	39.2	40.9	**99**	**40.7**
20-24	41.9	42.0	40.4	41.6	39.4	45.7	**614**	**41.9**
25-29	41.3	43.1	41.5	42.0	39.0	45.4	**736**	**42.0**
30-34	41.4	43.7	41.5	42.1	38.5	46.7	**387**	**41.9**
35-40	41.3	42.7	39.7	41.2	37.6	45.8	**152**	**41.2**
40-44	39.1	40.8	38.5	39.9	36.6	53.5	**30**	**40.8**

Source : Nutrition Profile of Karnataka (1996) R= Rural; T= Tribal; U= Urban

Table 13: Percentage distribution of Adult Women (18-45 years) according to the Obstetric Risk

District	No. Covered	Weight < = 38 kgs	Height < = 145 cms	Both
1. Gulbarga	448	28	21	13
2. Chitradurga	430	20	19	8
3. U.Kannada	428	33	28	19
Rural Pooled	1306	27	23	13
4. Mysore	414	47	24	18
5. Tumkur	400	18	15	7
TOTAL	2120	29	21	13

Source : Nutrition Profile of Karnataka (1996)

Table 14: Percentage distribution of All Adult Women (18-45 years) according to Body Mass Index (BMI)

BMI	Gulbarga	Chitradurga	U.Kannada	Mysore	Tumkur
Number	436	423	416	409	396
< = 16	13	14	14	28	10
16.1 - 17.0	15	9	16	20	10
17.1 - 18.5	29	28	29	32	20
18.6 - 20	23	24	22	12	18
20.1 - 25.0	19	24	18	7	32
> 25	1	2	2	0	10

Source : Nutrition Profile of Karnataka (1996)

Table 15 : Percent distribution of women (15 – 45 years) according to different Nutritional Deficiency Signs (number covered)

Sl. No.	Nutritional Deficiency 1-5 Yrs.	Gulbarga (R)	Chitradurga (R)	U.Kannada (R)	Rural Pooled	Mysore Tribal	Tumkur Slum
	Number	448	430	428	1316	414	400
1	Pallor	31	34	34	33	43	34
2	Koilonychia	3	2	0.7	2	1	0.3
3	Teeth Mottled Enamel	9	4	4	6	1	1
4	Thyroid Enlargement	13	18	26	19	24	13

Source : Nutrition Profile of Karnataka (1996)Table 20: Percent distribution of pre-school children (1-5 years) according to different Nutritional Deficiency Sings (number covered)

Table 16 Anaemia among women

Percent distribution of women by degree of iron-deficiency anaemia, according to background characteristics, Karnataka, 1999

Background characteristic	Percentage of women with: No anaemia	Mild anaemia	Moderate anaemia	Severe anaemia	Total Percent	Percentage with any anaemia	Number of women
Age							
15-24	52.6	29.3	16.4	1.7	100.0	47.4	1,141
25-34	59.8	25.4	12.5	2.4	100.0	40.2	1,503
35-49	59.3	25.8	12.2	2.7	100.0	40.7	1,476
Number of living children							
0	55.4	26.0	17.2	1.4	100.0	44.6	442
1	58.5	23.1	15.9	2.5	100.0	41.5	669
2	56.6	30.1	10.9	2.5	100.0	43.4	1,170
3	60.1	24.3	13.7	1.9	100.0	39.9	908
4+	56.8	27.3	12.9	3.0	100.0	43.2	930
Residence							
Urban	64.2	24.6	9.8	1.3	100.0	35.8	1,439
Rural	54.0	27.7	15.4	2.9	100.0	46.0	2,681
Education							
Illiterate	52.5	28.7	15.5	3.3	100.0	47.5	2,255
Lit., < middle school complete	59.4	26.8	11.5	2.3	100.0	40.6	778
Middle school complete	62.4	21.7	15.5	0.4	100.0	37.6	281
High school complete and above	68.3	22.1	9.1	0.5	100.0	31.7	806
Religion							
Hindu	57.4	26.4	13.8	2.4	100.0	42.6	3,539
Muslim	58.6	27.0	12.4	2.0	100.0	41.4	450
Christian	63.3	30.6	6.2	–	100.0	36.7	99
Other	(48.7)	(35.4)	(12.6)	(3.3)	100.0	(51.3)	31
Caste/tribe							
Scheduled caste	53.4	26.0	18.3	2.4	100.0	46.6	674
Scheduled tribe	54.1	27.2	16.5	2.2	100.0	45.9	231
Other backward class	58.1	26.8	12.7	2.4	100.0	41.9	1,717
Other[1]	59.7	26.3	11.7	2.2	100.0	40.3	1,453
Missing	(50.0)	(35.0)	(12.9)	(2.1)	100.0	(50.0)	46
Employment status							
Working in family farm/business	52.7	28.0	15.2	4.1	100.0	47.3	679
Employed by someone else	52.6	29.7	15.4	2.3	100.0	47.4	1,203
Self-employed	57.0	25.9	14.7	2.4	100.0	43.0	243
Not worked in last 12 months	62.3	24.4	11.6	1.8	100.0	37.7	1,995
Pregnancy/breastfeeding status							
Pregnant	51.5	20.7	24.9	2.8	100.0	48.5	277
Breastfeeding (nonpregnant)	54.6	30.3	12.5	2.5	100.0	45.4	714
Nonpregnant/non-breastfeeding	58.8	26.3	12.7	2.3	100.0	41.2	3,129
Total	57.6	26.6	13.5	2.3	100.0	42.4	4,120

Note: Haemoglobin levels are adjusted for altitude and smoking when calculating the severity of anaemia. Total includes 1 woman with missing information on employment status, who is not shown separately.

( ) Based on 25-49 unweighted cases

[1]Women who do not belong to a scheduled caste, a scheduled tribe, or an other backward class. NFHS-2 Karnataka, 1999

Table 17 Anaemia among children

Percent distribution of children under three years of age by degree of iron-deficiency anaemia, according to background characteristics, Karnataka, 1999

Background characteristic	Percentage of children with: No anaemia	Mild anaemia	Moderate anaemia	Severe anaemia	Total percent	Percentage with any anaemia	Number of children
Age of child							
< 12 months	43.8	20.8	33.7	1.7	100.0	56.2	345
12–23 months	21.9	20.2	48.7	9.2	100.0	78.1	356
24–35 months	37.8	16.4	36.8	9.0	100.0	62.2	308
Residence							
Urban	37.6	19.8	38.0	4.6	100.0	62.4	326
Rural	32.6	18.9	41.1	7.5	100.0	67.4	685
Sex of child							
Male	31.8	17.0	43.0	8.2	100.0	68.2	516
Female	36.7	21.5	37.0	4.8	100.0	63.3	496
Birth order							
1	40.8	16.0	38.5	4.7	100.0	59.2	357
2-3	31.2	21.5	39.7	7.6	100.0	68.8	469
4-5	31.0	21.4	39.8	7.8	100.0	69.0	141
6+	(22.3)	(13.4)	(57.8)	(6.5)	100.0	(77.7)	45
Mother's education							
Illiterate	26.6	19.2	44.3	9.8	100.0	73.4	503
Literate, < middle school complete	38.5	20.5	37.1	3.9	100.0	61.5	177
Middle school complete	36	16.8	42.0	4.4	100.0	63.2	90
High school complete and above	45.7	19.1	32.7	2.5	100.0	54.3	242
Religion							
Hindu	34.5	19.6	40.3	5.6	100.0	65.5	820
Muslim	30.9	18.6	38.1	12.4	100.0	69.1	167
Caste/tribe							
Scheduled caste	26.8	20.8	44.4	8.0	100.0	73.2	198
Scheduled tribe	34.7	19.8	37.6	8.0	100.0	65.3	61
Other backward class	37.5	18.1	41.6	2.8	100.0	62.5	357
Other[1]	35.5	18.5	37.0	9.0	100.0	64.5	384
Mother's anaemia status							
Not anaemic	39.1	20.9	35.3	4.8	100.0	60.9	538
Mildly anaemic	31.0	17.3	44.0	7.8	100.0	69.0	310
Moderately anaemic	25.1	16.1	49.7	9.2	100.0	74.9	138
Severely anaemic	(19.1)	(23.3)	(42.5)	(15.1)	100.0	(80.9)	26
Total	34.2	19.2	40.1	6.6	100.0	65.8	1,012

Note: Haemoglobin levels are adjusted for altitude when calculating the severity of anaemia among children. Total includes 20 children who are "christian", 4 children belonging to "other" religions and 11 children with missing information on the caste/tribe, who are not shown separately.

( ) Based on 25-49 unweighted cases

[1]Children who do not belong to a scheduled caste, a scheduled tribe, or an other backward class NFHS-2, Karnataka, 1999.

Table 20 : Percent Distribution of pre-school children (1-5 years) according to different Nutrition Deficiency Sings (number covered)

Sl. No.	Nutritional Deficiency 1-5 years	Gulbarga (R)	Chitradurga (R)	U.Kannada (R)	Rural Pooled	Mysore Tribal	Tumkur Slum
	Number	**565**	**503**	**504**	**1572**	**524**	**521**
1	**Hair Sparse, Discoloured, Easily pluckable**	**0.0**	**0.2**	**0.2**	**0.1**	**0.2**	**0.2**
2	**Oedema**	**2.3**	**1.2**	**0.8**	**1.5**	**1.1**	**0.0**
3	**Emaciation**	**13.3**	**5**	**8**	**9**	**7**	**3**
4	**Marasmus**	**3**	**1**	**0.6**	**1**	**1**	**0.0**
5	**Night Blindness**	**0.5**	**0.0**	**0.2**	**0.3**	**0.4**	**0.0**
6	**Bitot Spots**	**2**	**0.6**	**0.4**	**0.9**	**0.8**	**0.0**
7	**Angular Stomatitis**	**6**	**3.0**	**1**	**4**	**3**	**1**
8	**Pallor**	**18**	**24**	**16**	**19**	**29**	**19**
9	**Koilonychia**	**0.9**	**0.6**	**0.8**	**0.8**	**0.6**	**0.2**
10	**Teeth Mottled Enamel**	**5**	**1.0**	**9**	**5.0**	**1**	**0.6**
11	**Thyroid Enlargement**	**0.4**	**0.6**	**1**	**0.6**	**1**	**0.2**

Source : Nutrition Profile of Karnataka (1996)

Table 21 : Prevalence of Goitre in the Project Districts

District	Population Covered	Cases of Goitre Detected	Prevalence (%)
1. Chikmagalur	3,196	1314	41
2. Gulbarga	9,582	465	5
3. Raichur	7,765	151	2
4. Tumkur	17,328	388	2

Source : Baseline Survey report on goitre prevalence in Karnataka.
Directorate of Health and Family Welfare Services.

(i) Soil deficiency of micro-nutrients is wide-spread in Karnataka, especially with respect to iodine, zinc and iron. The Plantation districts of Chickmagalur and Kodagu standout. Other affected districts are D.Kannada and U.Kannada which are on the coast line.

(ii) 235 randomly selected villages and 169 schools in **all** the districts of Karnataka, were selected for the above survey. Adults and schoolers were the subjects.

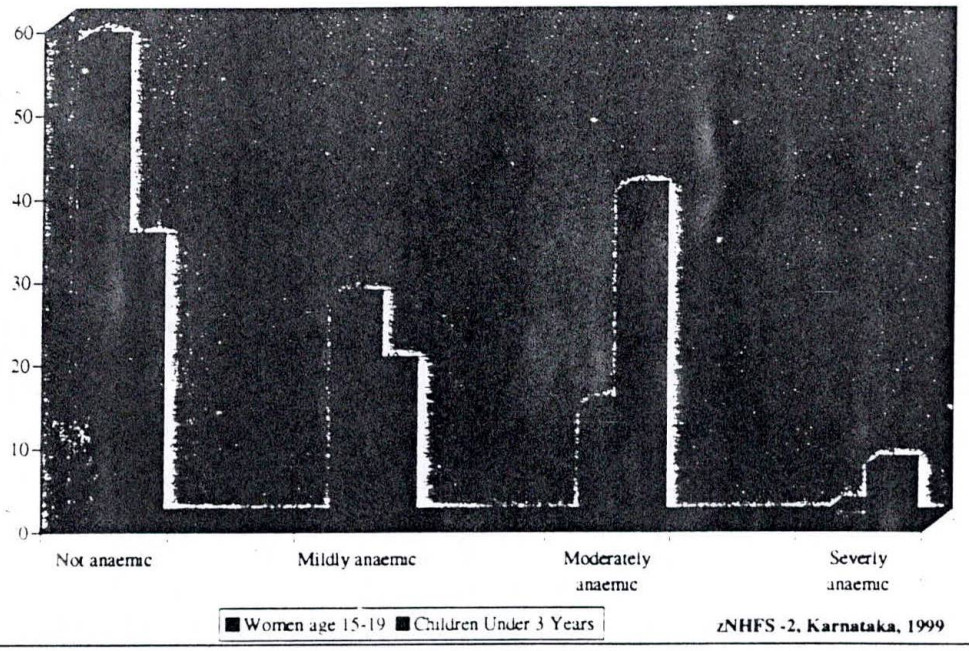
Table 22: Percentage distribution of pre-school children (1-5 years) according to Gomez grades of Malnutrition

Districts	Normal	Mild	Moderate	Severe
Gulbarga (R)	5	27	46	20
Chitradurga (R)	6	27	52	16
U.Kannada (R)	8	39	44	9
Pooled (R)	6	31	48	15
Mysore (T)	2	24	59	15
Tumkur (U)	8	44	40	7

Source : Nutrition Profile of Karnataka (1996)

The corresponding figures for All-Karnataka in the NFHS-2 survey of 2000 were: 9% for Normal; 39% for Mild; 45% for Moderate; an 6% for Severe. There is a distinct trend of Severe Malnutrition going down from 14% in 1975 to 6% in 2000. The Normal grade also shows an increase of 5% to 9% (most recent figure from the NNMB Survey (1999). The 'Under Fives' in Gulbarga (one of our Study Districts needs special attention).

Figure 3
Anaemia Among Women AndChildren



Maternal and child Health Programmes in Karnataka

Fig 4: Percentage of Children Under Age Four Who Are Under Weight by Age

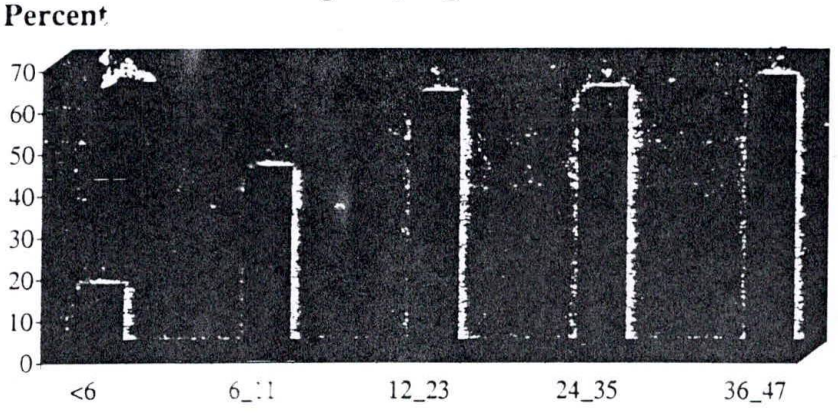


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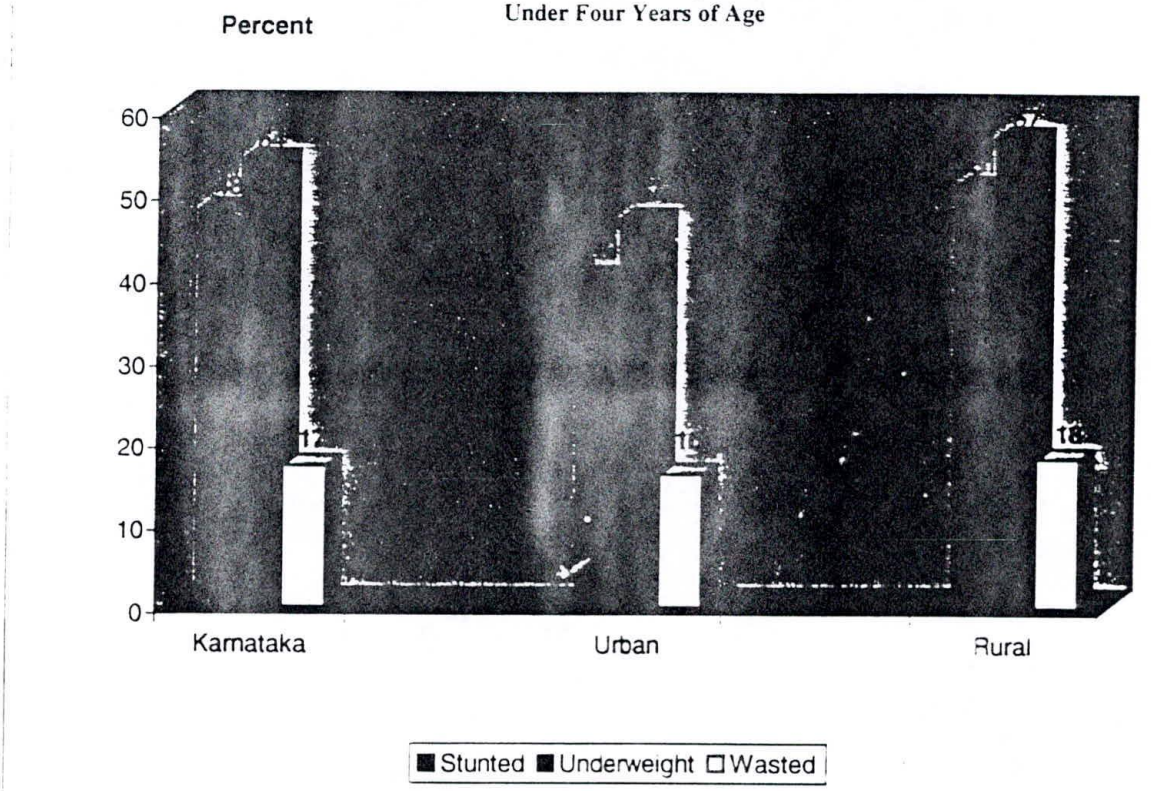
fig 5:
Undernutrition Among Children
Under Four Years of Age



Maternal and child Health Programmes in Karnataka

1. Programmes:

(i) The major feeding programmes are the ICDS for the mother and child; and the Mid-Day-Meal-Programme for the mother.

(ii) The vertical programmes are the IDD, the VAD and the IDA vertical programmes.

(iii) **The various programmes in operation are shown below.**

Programme	Target Group	Inception	Implementing Agency
1. Special Nutrition Programme (SNP)	Children 0-5 years: Expectant Nursing Mother. in Urban Slums & Tribal areas	1970-71	Dept. of Women & Child Development
2. Mid-Day-Meals Programme	Primary School Children		Department of Education
3. Prophylaxis against Blindness due to vitamin 'A' Deficiency among Children	Children 1-5 years	1970	Department of Family Welfare
4. Prophylaxis against Nutritional Anaemia among mother and children	Children 1-5 years. Expectant Nursing mother		Department of Family Welfare
5. *Expanded Programme of Immunization (EPI)	Children. Expectant mother	1978	Department of Family Welfare
6. Integrated Child Development Scheme (ICDS)	Children 0-5 years. Expectant Nursing mother. Women age 15-45 years	1975-76	Dept. of Women and Child Development.

* Expanded Programme of Immunization (EPI) became Universal Immunization Programme (UIP) in 1985 when specific targets were fixed for achievement by the year 1990.

(iv) There are a three other programmes such as the National School Health Programme and the National Diarrhoeal Diseases Control Programme, which ideally should work hand in hand with the above programmes for synergistic results.

The Child Survival and Safe Motherhood programme, which is administered by the DH&FW. In fact there is a lot of overlap in service delivery of health and or nutrition inputs.

3.4 FOOD HABITS AND TABOOS REGARDING INFANT FEEDING

Negative:

Virtual Starvation of the Child (6 to 48 months of age)

(i) The greatest and most alarming negative Food Habit and Taboo is the **virtual starvation of the infant/ child from 6-48 months of age.** This has been dealt with in the previous chapter. It is particularly bad in the case of the infant (6-12 months of age)

(ii) The habit of discarding colostrum is common to practically the whole of India. In Karnataka it ranged from 57 to 66%. The habit of giving water and honey, herbal concoctions, and/ or castoroil was prevalent among 70 to 90% of the mothers ***(Fig 6)***

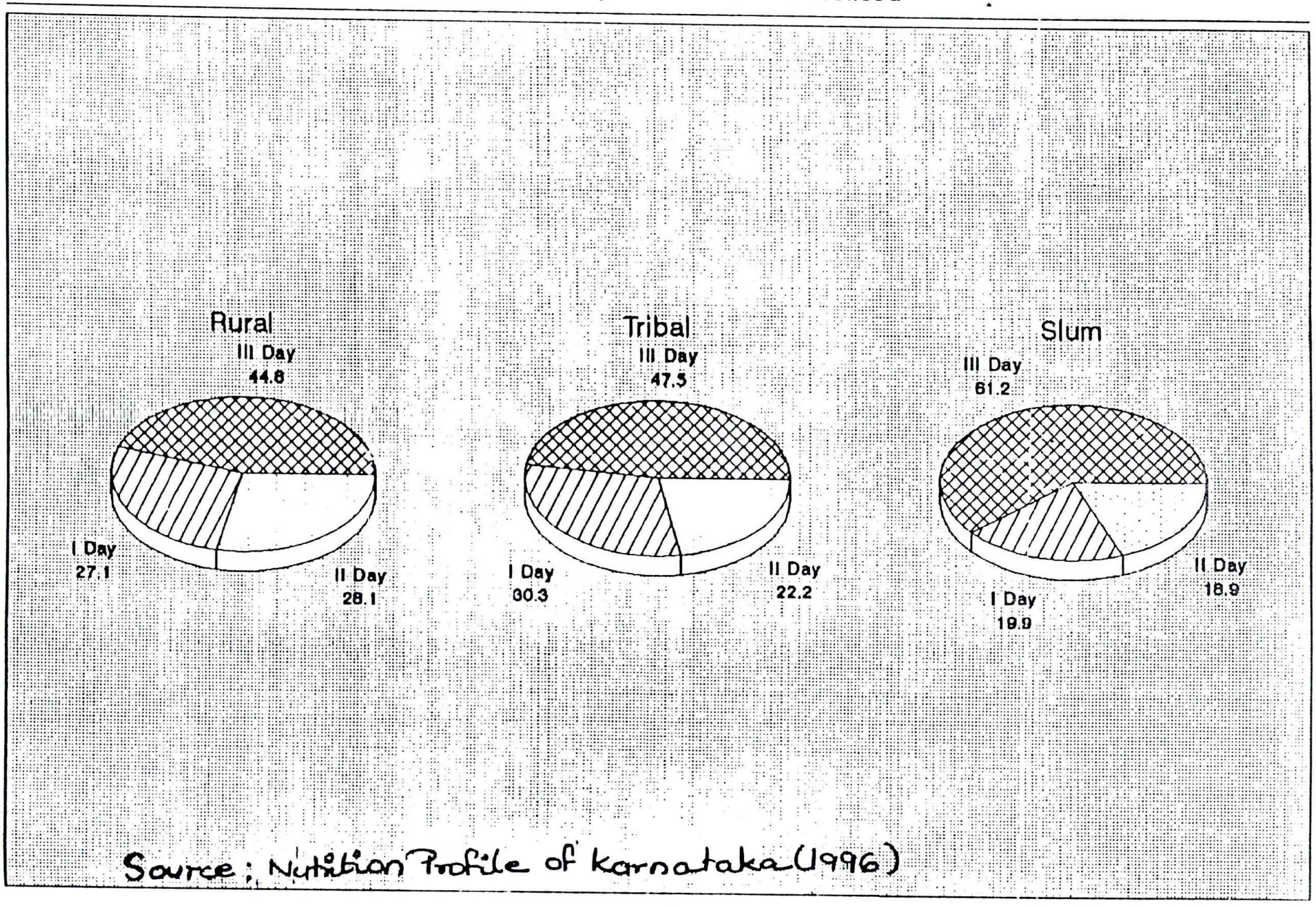
(iii) Slum mothers due to economic constraints are **stopping** breastfeeding at 4 months. Some do this when their infant is just 2 months old. Expensive Commercial Baby Foods are bought but fed in highly diluted and small amounts.

Positive:

(i) In the ragi-growing regions- sprouted ragi powder is often given to the infant as his first weaning food. Germination **does** enhance the availability of all the vitamins and minerals. Hence, with slight modifications, this can certainly be improved with the addition of sprouted green gram powder and **fortified** with necessary vitamins/ minerals.

(ii) Karnataka has a very good 'trained-dais' net work.(approximately 40,000). These are the women who can be given basic nutrition and health education. They enjoy the confidence of the mothers.

FIG6: PERCENTAGE DISTRIBUTION OF INFANTS
Based on the day of Initiation of Breastfeed

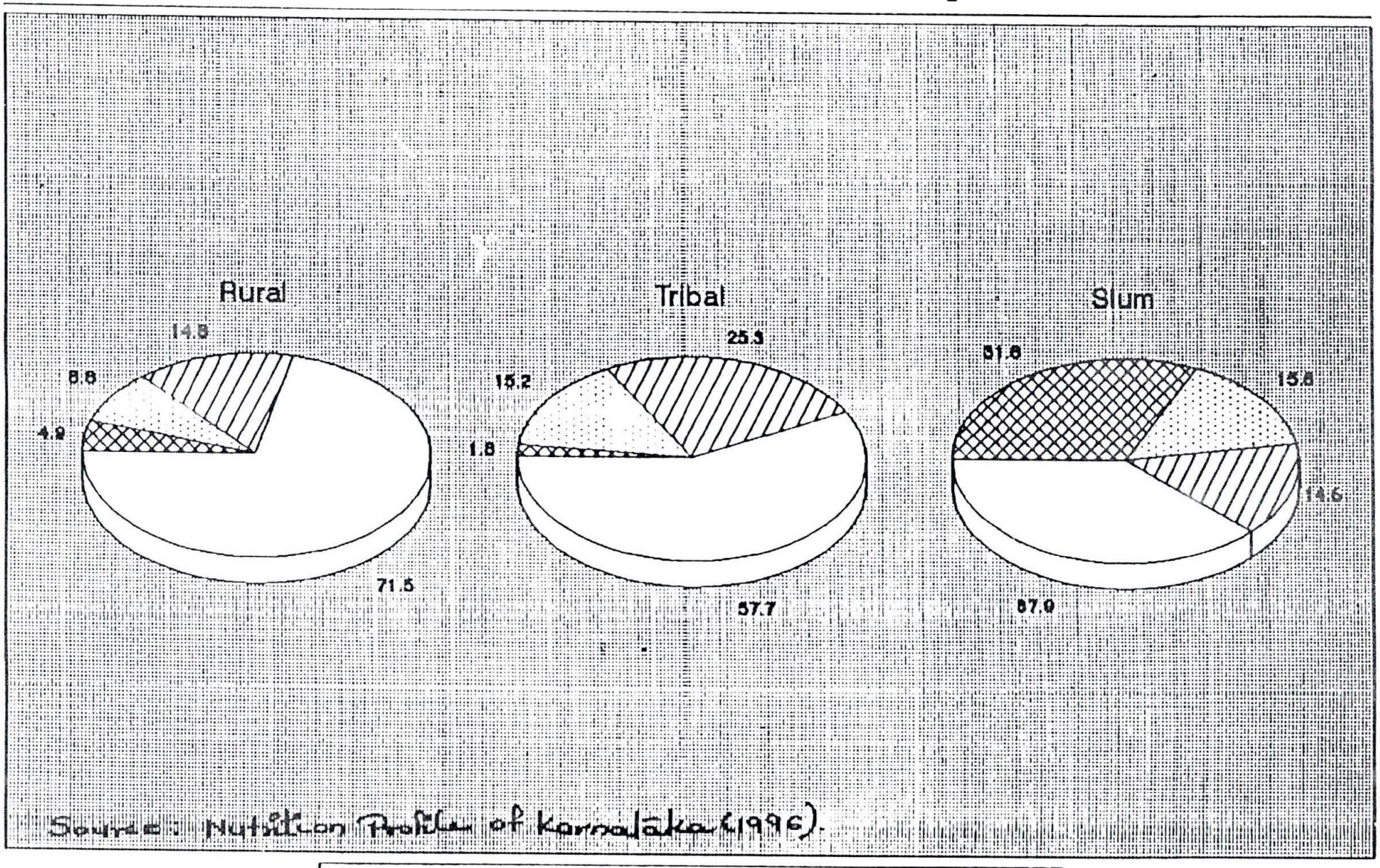


Source: Nutrition Profile of Karnataka (1996)

3.5 KNOWLEDGE, ATTITUDE AND PRACTICES (KAP)

1. **Knowledge and Practice regarding Age of Marriage:**
   Adolescent girls are married much too young usually at 14+ years, when they have **not completed their own growth and development.** This has been shown to have very negative outcome for the young mother and child. This is particularly bad in Gulbarga and Raichur .
2. **Practice of discarding Colostrum:**
   In Rural, Tribal and Slum, Karnataka, about 60% discard colostrum. The first milk is considered unclean. This is on the advice of the elders.
3. **Initiation of Breast Feeding:**
   Late initiation of breast-feeding of the newborn. Only about 30% in the Rural and Tribal; and about 20% among the Slum Dwellers initiated breast feeding on the first day.
4. **Pre-Lacteal Feeds:**
   These consisted of plain water, sugar water, herbal concoctions, castor oil or cow's milk in 60% or more homes. The figures in two of our Project Districts were 62% in Gulbarga and 63% in Tumkur.
5. **Reduction of Period of Exclusive Breast-Feeding by the Slum Mothers:**
   Fig.7 shows that about 32% of the slum mothers breast-feed their babies for only two months. Expensive proprietary brands of Infant Formula are bought and fed to the baby in miniscule amounts.
6. **Use of Unsafe Water:**
   Use of Unsafe Water for making up the feeds. This is probably the **worst practice.** There is scanty knowledge that **water is food.** If unclean water, utensil and/ or feeding bottles are used the baby will surely have severe diarrhoea and may die.
7. **Unclean breast and / or finger-nail hygiene:**
   Mother is unwittingly very often the cause of GIT illness in their babies. Studies have shown that the mother's fingernails are very often contaminated with fecal matter. The mother's say, "where is the water to stay clean?"
8. **Abrupt Weaning** and/ or late Introduction of miniscule amounts of household diet/ or diluted cows/ buffalo's milk, or kanji. In Karnataka, the 1-2 year old child gets only about 600 to 700 kcal of food energy leaving a wide gap of about 300 to 500 kcal. Since the home diet is virtually **devoid** of protective foods, the baby misses out on these essential foods as well. No major survey has yet quantified the item/s and or **amount** of CF given to the baby. In short, **an infant one-year-of-age needs half what his father eats.** This knowledge is totally lacking at any level and needs to be reinforced.
9. Last but not least, we the educated, especially our medical and health fraternity need to have a better understanding and appreciation **of Public Health Nutrition,** before expecting miracles regarding KAP in the LIG and illiterate populations.
10. In Karnataka, atleast half of all the boys and girls **finish upto secondary school.** This population group is a huge one-fifth of the total population or a little more than a crore of a receptive and captive audience for practical IEC. We should capitalize on this.

FIG 7: PERCENTAGE DISTRIBUTION OF INFANTS
Based on Duration of Exclusive Breastfeeding



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CHAPTER FOUR :KARNATAKA'S SPECIFIC NUTRITION GOALS FOR 2000 AD AND ITS ACHIEVEMENTS IN THE 4 ICDS STUDY DISTRICTS OF THE PILOT STUDY AS OF FEBRUARY, 2000

- **To bring down the levels of moderate and severe malnutrition to half the 1990 levels.** As of 2000AD severe malnutrition in the ICDS Projects of the 4 Study districts, has been virtually wiped out in Chikmagalur and Tumkur in the 'Below One' age group and in the 1-3 years age group. It is 2% in Gulbarga and 3% in Raichur. In the 1-3 years age group the figures are again 2% for Gulbarga and 3% for Raichur, In the 'Below Ones' the task of moving the 23% in the Moderate Category to the Mild in Gulbarga; or 29% in Raichur; or the 9% in the Tumkur; or 12% in Chickmagalur **will not be easy.** The picture for the 1-3 year olds in similar to the figures for Chickmagalur being 13%; for Gulbarga-30%; for Raichur 32%; and for Tumkur-14%.

- **Reduction in the incidence of Low Birth Weight (LBW) babies by 20% from the level existing in 2000**
  The prevalence of LBW is 27-56% in the urban areas and 33 to 41% in the rural areas. In the intergenerational life cycle the birth outcome depends to start with on the nutritional status and nutriture of the schooler → the adolescent → the married woman → the pregnant women → birth outcome. **Hence, it would be best to tackle the problem starting with the Schooler (both boy and girl from Primary upto Secondary School Level) and carry on with services/ interventions thereon. This is where great success in reducing LBW can be achieved through an equal and willing partnership between Education and DH&FW, especially at the district, Taluka, Block and Village Levels. School enrolment in Karnataka is high (70-80%). Attendance at the Secondary school level is 55% even among the females. Nutrition-Health Education (NHE), a meal + the health package of "deworming + iron + VitaminA" can be easily delivered in the 'Class Room'. Each child can become a powerful messenger to his/ her family. This will lay a strong foundation for atleast half the school population to become better-nourished fathers/ mothers. LBW can be wiped out in just a few years if we can tackle the problem at its root and not wait till the horses have bolted their stables.**

  If we miss the chance at the school-level we can with difficulty catch up with the pregnant mothers and **either enrich the ICDS food supplement with atleast iron-folic acid or deliver iron folic acid tablets just two-times a week as soon as the woman realizes she is pregnant.** Even these strategies can considerably reduce the percentage of LBW babies. District-wise data are not available on LBW and needs to be included in the Pilot Project Baseline Survey. **Since IFA tablets have not succeeded very well in India, perhaps we should change track and try a high dose of vitamin-C in a multinutrient tablet or 'Add-On' of iron, folic acid and vitamin B-12.**

- **Elimination of blindness due to VitaminA Deficiency**
  The control, let alone elimination of blindness due to vitaminA deficiency (VAD), has **not** been successful or eliminated in India or in Karnataka. The average intake of vitaminA is 403µg in Chickmagalur; 188µg in Gulbarga; and 263µg in Raichur; and 267µg in Tumkur VS the RDA of 600µg. The population segment most affected in descending order are the Under 1 to 6 year old child; the school child (where Bitot spots are >7%); and then the others. Atleast 40% of the total population can be protected through the ICDS and the Mid-Day-Meal Programme. The common man's diet in Karnataka is **most deficient in vitaminA. All strategies** to reduce the prevalence of the clinical signs of VAD. let alone blindness, should be employed. It should be

made mandatory that PDS commodities such as fats/ oils, be enriched with vitaminA. It should also be made mandatory that the double toned milk (Rs.9/ litre) be enriched with vitaminA, vitaminD and E. Although the percapita milk be fortified. Consumption is very low among poor families, yet even this little bit more of vitamin A, will help reduce the eye signs, morbidity and GIT episodes to a great extent. Karnataka is rich in horticulture. Dehydration methods to save horticulture crops and re-distribution to the poor could be another strategy.

This Pilot Project could make a beginning by fortifying the SNP with 100% of the RDA of each vulnerable group for as many vitamins/ minerals as possible. This has been found to be the most cost-effective way of reducing/ eliminating VAD and other micronutrient deficiencies in the rest of the world.

Post-partum women can be safely dosed with a mega-dose of 2 lakh units of vitaminA (capsule or syrup) from the 4 to 40th day post-portrum. This will help enrich the breast-milk and thereon to the infant.

- **Reduction in Iron Deficiency Anemia (IDA) in Pregnant women to 30%**
  This has not been achieved in India nor in Karnataka in 2000 AD. There is a paucity of information in the IDA status of the vulnerable groups in Karnataka as a whole and in the 4 Pilot Study Districts. Using the Sahli's method, the Nutrition Profile of Karnataka, 1996,reported that practically all women in Gulbarga, Chitradurga, U.kannada, Mysore Tribal and Tumkur Slums were found to be anemic with 46% being severely so; 43% moderately so and 9% mildly so. The most recent data of the National Family Health Survey-2, using the accepted cynmethamaglobin method has found the values to be **quite improved.**

  Unless Karnataka takes extremely innovative and bold steps and strategies it is unlikely that the 30% IDA status in the pregnant women will be achieved. Pregnant women for some reason do **not** like taking an IFA tablet every day for 100 days in their last trimester. Some of the innovative strategies could be:

- **An add-on vitamin-mineral packet to their morning 'ganjee' (rice or ragi gruel).**
- **Fortification of the atta (ragi, rice, wheat, jowar, jowla) sold through the PDS with iron, folic acid and ascorbic acid (vitaminC).**
- **VitaminC medicinal supplementation tablet on 'Add-On' form. Mass deworming of the subjects.**
- **Popularising the greater use of fermented (iddli, dosai, appam) and/ or germinated cereals/ pulses.**
- **Try methi-pak in the North-Western region.**
- **We would restate that the place to start is at the Primary School level for both the boy and girl where each district would have a huge captive and receptive audience.**
- **Distribute fortified foods for all the vulnerable groups in the ICDS.**

Universal Consumption of iodized salt:

- IDD appears to be becoming an endemic problem inspite of note-worthy increases in the consumption of iodized salt in Karnataka. **This could be due to spurious brands of iodized salt being sold in the market.** A most recent survey (1998) conducted by Tara Consultancy Services, in Chickmagalur (one of the study districts), put thyroid enlargement at 18% in the Tea Pluckers (mostly female) 20% in the non-pluckers, and nil in children below 6 years of age. The Karnataka Nutrition Profile (1996), put thyroid enlargement in Gulbarga and Tumkur at 13%

each. Another survey (1988-91) conducted by the Directorate of Health and Family Welfare Services, pointed to only Chickmagalur being a problem district with 41% schoolers/ adults being clinically affected. In 1996, only 1% each in Gulbarga and Tumkur were using iodized salt.

In sum, food crops grown on soils deficient in this (Iodine) and other micronutrients (iron and zinc) will surely affect the populations that are consuming food from these crops.

- **Encouragement of all women to breast feed their babies for the first six-months and continue to do so with appropriate complementary foods thereafter upto the child's second year.**

  Fortunately exclusive breast-feeding till the milk dries up seems to be the norm in India and Karnataka. However, there is a trend that only about 40% exclusively breast-feed their infants' upto 6 months of age.

  The more serious problem is the non-introduction of an appropriate and adequate complementary food from the child's 6th month of life. The introduction of **any kind of complementary food (amount not specified),** was 8% in Gulbarga and 19% in Tumkur.

Making all hospitals and maternities "baby friendly" as defined by the Ten Steps to Successful Breastfeeding.

The Nutrition Profile of Karnataka states that in 1996 over 60% discarded colostrum; well over 80% gave prelacteal feeds; and only about 20-30% commenced breast-feeding on the first day. All these poor practices should be addressed in a **massive Awareness Programme** not only the **mother,** but to the **lay public,** the families, the schoolers, the adolescents, the grass-root implementers of the ICDS and MDM Pogrammes, particularly at the District level and down wards.

- A simple strategy would be to give the lactating mother 2 lakh units of vitaminA within 4 days post-partum.
- Let the umbilical cord stop pulsating. Much more micronutrients, especially iron will flow into the baby. Then cut and tie.
- Emphasise breast and nail hygiene.
- Emphasise cup and spoon feeding rather than bottle-feeding.

Institutional deliveries still tend to be poor at about 40% in Rural and even Urban communities.

Further Nutrition Goals that could be introduced in the Pilot Project

- **Water is food. Ensure that safe drinking water is available in the Project areas.**
- **Include 5mg zinc/ day in the vitamin-mineral pre-mixes. It is absolutely safe and improves the growth of the child enormously USAID-donated food, which India has been accepting for its ICDS fortifies its Corn-Soya-Blend (CSB) with 5mg zinc/ 100 g CSB.**
- **Sometimes indirect measures such as periodic and mass community or at least deworming (ICDS & MDM) of the vulnerable groups improved sanitation, better personal hygiene of mother and child can improve the nutritional status of the vulnerable groups.**
- **Massive Nutrition-Education is required for all Health and Non-Health functionaries of the ICDS and MDM. So also for the higher rungs of medical personnel.**
- **Make Public Health Nutrition a compulsory subject in all Medical and Health Institutions of the 4 Pilot Project Districts. Also for the state of Karnataka.**

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CHAPTER FIVE: INTER-SECTORAL LINKAGES

For the purpose of this Pilot Project, five State Departments have been picked out for close partnerships and linkages, especially at the District Level. These are:

- The State Department of Woman and Child (nodal department, DWCD)
- The State Department of Health and Family Welfare (DH&FW)
- Zilla Panchayat
- Civil Supplies
- Information and Broadcasting.

The Design of the ICDS and the Key Role of DWCD-Karnataka:
A close interaction and collaboration between the nodal Department of Woman and Child (DWCD-K); and the Department of Health and Family Welfare (DH&FW) **is essential.** The Department of woman and Child is the king-pin department in the ICDS. Its key role is to ensure **inter-sectoral coordination,** especially of those departments listed above, to achieve its Nutrition Goals.

As can be seen from Section 4, Karnataka's ICDS programme has done remarkably well in practically eradicating severe malnutrition by 2000AD. With a strong linkage with Health, Zilla Panchayat, Civil Supplies and Information and Broadcasting, it is sure to make a success of the '4-District Pilot Project'. It could specifically undertake the following Actions for Success.

Health:
Some of the activities that would help this Pilot Project would be:

- DH&FW-K, can play a pivotal role in ensuring that its paramedical staff (LHVs/ ANMs) work in close collaboration with DWCD at District, Taluka, Block and Villages levels. There should be **convergence of services of the non-health and health on the (INHP) days (Please see section 7 for details).**
- Ensure that the PHCs/ SHCs are functioning in the four programme districts.
- Ensure that Public Health facilities are set-up at the Taluka Level to carry out simple estimations of Hb, (in blood), iodine (in urine) and vitamin A (clinical) safe water (using kits) etc. One should have continuous monitoring and evaluation.
- Ensure that the Medical and Health Staff at the District to Village Level know **their NHE as far as the ICDS goes. Give status to Nutrition and introduce it as a compulsory subject in the medical curriculum.**

Zilla Panchayat (ZP):

- Karnataka has a strong Panchyati Raj (PR) institution at District, Taluk, Block and Village Levels. It is these institutions that should play a key role in improving the nutritional status of the vulnerable groups, especially the 'Under Threes' who are scarcely visible at the Anganwadis (AWCs)
- It should play a pivotal role in forming linkages between the various departments listed above at District level to the Village. This where things appear to go wrong. For instance, PR could identify and establish the Self-Help-Women's Groups.
- **If (PR) could promote and support activities such as a crusade for Nutrition in the ICDS; food processing activities, especially weaning/ complementary foods) Nutrition-Health-Population education at every level especially to men and the Primary and Secondary School Levels;**
- Fortification of milk with Vitamin A and D:

- Working closely with Information and Broadcasting to broadcast messages that are location relevant in order to improve the nutritional status of the "Under Threes";
- Also to promote the Concept of the Intergenerational Life Cycle for Good Nutrition and that of a "Small Family Norm";
- Ensure that there is clean and safe water in the Project Districts. Water is Food in Nutrition.

Civil Supplies:

- Ensure that the PDS runs smoothly at every level.
- Promote the concept of co-operatives or community and/ or 'Panchayat-owned and run' ration shops.
- Promote the idea of fortification of fat/ oils with Vitamin A; and of the local flours/ attas with 'add-on-mineral/ vitamin' packages.
- Only stock good brands of iodized salt. Agitate for double-fortified salt (iodine and iron)
- Expand the PDS list to include common drugs (anti-diarrhoeals, anti-malarials, multi-vitamin-mineral tablets, ORS packet etc.)
- Sell the Complementary Food made by the 'Under Threes' by a centrally processed factory. Do not compromise the nutrition/ health of your precious under threes, especially your 6-24 months age group with SHGs or with local diet.

Information and Broadcasting:

- Multi-media, particularly the TV can be a potent influencer for good or bad in 2000 AD. Hence Information and Broadcasting should ensure that the 'Crusade for Nutrition' is their mission.
- Broadcast the good work the ICDS had done and proposes to do in the 4 programme districts.
- Take the initiative to be properly oriented to the Objectives/ Goals and Work Plan of the particular ICDS-Pilot; and promote it strongly.

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CHAPTER SIX : ORIENTATION/ TRAINING AND CAPACITY BUILDING

6.1. Karnataka is very fortunate in having the Regional National Institute of Public Cooperation and Child Development,NIPCCD, an excellent Training Institution for senior Level Officers, located at Bangalore. This Regional Institute continuously trains the Child Development Project Officers (CDPOs) of the ICDS of Karnataka, Tamil Nadu, Kerala, Andhra and the UT of Pondicherry. **It charges no training fee, as it is part and parcel of NIPCCD-GOI, New Delhi.** It also holds several orientation, capacity building and training courses for State and District level functionaries. Hence, NIPCCD-Bangalore could be identified to **orient** the State and District Level Implementing officers of the Pilot Study.

6.2. **NIPCCD, Bangalore is promoting the excellent concept of 'Nutrition-Health Dyads' which is very much in tune with the 'INHP Days' promoted in chapters 3 to 5 , Part Two of this Report.** It could also be identified as the **Training Centre** for the **34** ICDS-CDPOs and 34 PHC doctors of Chikmagalur, Gulbarga, Raichur and Tumkur. These 34 CDPOs + 34 PHC doctors would become the Master Trainers for their Supervisors at their respective Block Head Quarters. The Supervisors-ANM, dayads, in-turn will become the Master Trainers for their respective flock of Anganwadi workers/ CCAs/ TBAs/ & Adolescent Girls.

6.3. This type of descending tier upon tier type of In-Service-Training with **emphasis on the Implementation of the various strategies suggested (pl. refer chapters 1-14 of Part Two)** has been successful in CARE-India's Project Poshak and CARE-India's Integrated Nutrition Health Day Strategies (1,2). It is also a cost-effective method of Training. Please refer to Table One. Approximately 1088 State, District, Block Level and 28472 Block to Anganwadi Level functionaries need to be Trained in just the four Pilot Districts.

6.4. **However there is a problem currently in Karnataka. Many of the posts of CDPOs, Supervisors, Anganwadi workers and Helpers are not filled. Similarly, several District level to the Village-level posts of Medical and Health Workers of DH&FW remain unfilled. These posts need to be filled immediately in the four Pilot districts, if the Training Component is to have any meaning or impact (pl. refer to Specific Short Term Objectives listed at Chapter Two, Part One).**

6.5. Training of the different categories (District Level) downwards would again depend on which Strategies DWCD decides to implement in the Pilot Programme. The more focussed one is on the Strategy/ ies, the better will be the Impact.

6.6. For the State Level to District Level officers, one could dwell on the Situational Analysis and Nutritional Profile of the 'Under Two'; the P/L woman; the 'Above Threes'; and the Adolescent Girl. Then go on to the Consequences and so on. Then to the strategy/ ies, Pilot District by Pilot District. In the case of the Block Level to the lower rungs of the ICDS, in my experience, **acting out and demonstrating each service input works better.** For instance the Flip Chart used in Project Poshak was well understood by the doctors, LHVS and ANMs. In the case of the Tribal and Non-Tribal illiterate mothers, it was actual 'demos' that were comprehended. This would be true for 'Caring Practices' (1,2,3) or reconstitution of a RTE food supplement for the 'Under 2'; use of an 'Add-On' of "ARF + micros"; or the use of common medicines.

6.7. **The Chapters of Part One,** that the four Coordinators/ Field officers and Communication Media and Master Trainers should familarize themselves for relevant Nutrition-Health-Hygiene NHE messages would be **chapters 3 to 5 and chapter Seven of Part One of this report.**

6.8. There is only one Supervisor's Training Centre at Ujjiare, Mangalore. Hence, there is no other alternative except for the Tier-upon-Tier Training suggested at point 6.3 .

6.9. I have tried to identify some key teaching institutions in the 4 Pilot Districts that could serve as the key link Institution/s. This is set out in Table Two.

6.10. The Training and Information Dissemination component should also focus on :

- Need to review, evaluate and revise the ICDS, the Health, and the Medical Curriculae and make it much more practical, do-able and grounded in field-realties.
- Focussing on Integrated Nutrition Health Systems
- Training in building bridges with communities
- Training particularly in the absolute necessity of Nutrition and Health Services to Converge.
- **Training particularly in the importance of addressing Micro-nutrient Hunger.**

6.11. The Budget for Training will be quite different from that presented for West Bengal. It would be considerably lower as NIPCCD, Bangalore can do all the Orientation and/ or Training for the high-level functionaries. There is only **one** institution to train Supervisors. The budget estimate can only be worked out jointly by the DWCD and DHFW-Karnataka.

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CHAPTER SEVEN : MEASUREMENT OF NUTRITIONAL AND HEALTH OUTCOMES IN THE AREA OF PROGRAMME EVALUATION IN THE ICDS :

I. INTRODUCTION :

This chapter will overview input indicators, process indicators, output indicators and the measurements to be used for the output indicators, with reference to the Nutritional and Health status of the 0-6 year old child only. A similar Monitoring Format can be worked out for the Pregnant/ Lactating woman; and the Adolescent Girl.

In the ICDS, Supplementary Nutrition, Health Services; Pre-School Education and Nutrition Health Education are the four legs of the stool. I will now discuss each of the above components in some detail.

The **Food Component** is the most expensive part of the package and easily accounts for well over 50% of the total costs/ child/ annum. It is also the 'most valued' component of the ICDS package, by both the parent and the community (Gopaldas and Seshadri, (1987); Gopaldas etal (1975); the PEO Evaluation Report (1982); Gujral and Gopaldas (1991); and Kanani and Zararia (1996); Shah and Barua (1997).

After the Food Component, it is the Pre-School Component in the ICDS which is used **most regularly by the 3-6 year olds.** It is also the **most valued.** It is also highly valued by the parent and community for serving as (i) A free day-care cum free lunch Centre and (ii) The child's first school.

Although the Health Component (health, checkups, referral, immunization) are extremely important for the child's good health, the parent and community do not appear to attach much importance or value to the Health Services given at the AWCs. The major reasons being that the Health Staff are not readily available when they should be at the AWC (NIPCCD, 1992; and Kanani and Zararia, 1996). Generally, health and medical services **are sought,** but from a private practitioner. There is hardly any convergence of the Health and Nutrition Services in the ICDS (Shah and Barua, 1997) and (Pillai – 1995).

When it comes to monetizing, it is not **only the value** the parent or community attaches to a particular ICDS component, but also the cost of that component. The Food Component costs Rs.300/ child/ 300 feeding days/ annum. Hence, any error in monetizing the value of this component can land one in trouble. This will hopefully, go upto Rs.600/ child/ annum in 2000 AD in Karnataka.

There is a perennial shortage of Vitamin A. Although iron (ferrous sulphate) is both cheap and available, there is a lot of confusion with respect to its delivery, coverage or consumption by the child at the AWC. At the very least the child requires adequate amounts of Fe, VitaminA and I in its diet or as a medicinal supplement. All three are required to lessen morbidity, enhance cognitive ability and physical – work – capacity. **Hence, we should assign a high value to these 'mighty micros'!**

If there were less births, then those who are born would automatically get a better opportunity for a healthy existence. Hence, if ICDS and FP are linked and we should assign a high value for this.

However, it must be granted that the ICDS has resulted in better growth and development of the child. It had also resulted in better enrolment, more retention and fewer drops – outs.

TABLE ONE : APPROXIMATE NUMBER OF FUNCTIONARIES TO BE ORIENTED OR TRAINED

Name of District	Approx. No. of State/ District Level Officers to be oriented	Approx. No, of CDPO PHC Dyads to be trained	Approx. No, of Supervisor ANM Dyads to be trained	Approx. No. of AWWs/ Helpers of CCAS & TBAS etc. to be trained
1. Chikmagalur	7 x 30 = 210	7 x 2 = 14	7 x 10 = 70	1179 x 4 times = 4716
2. Gulbarga	11 x 30 = 330	11 x 2 = 22	11 x 10 = 110	2300 x 4 times = 9200
3. Raichur	5 x 30 = 150	5 x 2 = 10	5 x 10 = 50	1304 x 4 times = 5216
Tumkur	11 x 30 = 330	11 x 2 = 22	11 x 10 = 110	2335 x 4 times = 9340
Total	**1020**	**68**	**340**	**28,472**

Notes :

(i) There will be no charge for the 1020 senior officials or for the 68 CDPO PHC doctor dyads trained at NIPCCD, Bangalore.

(ii) If the 340 CDPO PHC doctor dyads jointly train the supervisor-ANM dyads at the ICDS-Block Head Quarters, it is for DWCD and DHFW to work out this cost.

(iii) If the Supervisor-ANM dyads jointly train the 28,472 AWW-Community Change Agents-TBAs-Adolescent Girls (4 types of Trainees) at the Anganwadi, the budget again will have to be worked out by DWCD-K.

TABLE TWO : Names of Some Teaching Institutions that could be the Link Institutions for Continuous Support and Training in each of the Pilot Districts.

1. Chikmagalur :	No teaching institution. The United Planters Association of Southern India, could depute its doctors to be the Link Trainers.
2. Gulbarga:	• D.R.H School of Nursing • School of Nursing, Khaza Bhandra Nawaz Hospital • School of Nursing, Kreethi Education Trust Society, Gulbarga
3. Raichur:	• School of Nursing, Raichur
4. Tumkur:	• School of Nursing, Siddaratha Educational Society, Tumkur • Shreedevi School of Nursing, Shreedevi Educaional Society, Tumkur

II. INPUT INDIATORS

1. Supplementary food to deliver 300 kcal + 8 to 12g protein/ child/ day for 300 feeding days/ annum at a low cost of Re.1/ ration (inclusive of **all** costs). A higher value should be given to Ready To Eat (RTE), appropriate and fully fortified foods Vs local foods. If the food is fully fortified with the child's daily requirement of vitamins and minerals, we need not have **vertical programmes such as currently operating for VitaminA Deficiency (VAD) or Iron Deficiency Anemia (IDA).**
2. Monthly recording of weight-for-age of all beneficiaries. It would be useful to have length-for-age or height-for-age taken once in 3 months. Then we could calculate the Body Mass Index (BMI) of the child (wt/ ht^2).
3. Nutrition Health Education for the mother/s at the AWC or the home/s of beneficiaries.
4. Safe water at the AWC (tap, borewell).
5. Iron, folic acid supplementation. It is syrup for the 'Under Threes' at 20mg elemental Fe/ day/ 300 feeding days. Usually there are difficulties in procurement, delivery, coverage and participation.
6. Mega VitaminA (2,00,000 IU) oral dose 2 times a year. Vitamin A is always in short supply. The GOI and States should take cognizance of this fact and resolve it.
7. Use of iodized salt (30 parts per million) in the RTE or cooked food preparation.

Health

1. Immunization : Each baby should have received by one year of age : BCG, DPT (3 times); OPV (3 times); and measles vaccine (once).
2. Health checkup by the PHC – doctor once a year/ child. Rarely done!
3. Referral of sick children to PHC or District-level-hospital.
4. Timely and proper management of GIT, URI, ARI and dehydration by the ANM and AWW. This requires adequate stocks of common medicines at the AWC. These are rarely there.
5. Regular deworming with Mebendazloe or Albendazole (200 to 400mg/ child/ twice/ year). Stocks are rarely sufficient.
6. Health and FP education.

Hygiene:

1. Safe water at the AWC.
2. Toilet (hopefully clean and usable) at the AWC.
3. Personal hygiene e.g. child comes bathed, neatly dressed and combed. No scabies, No lice, cuts nails. This is possible to check at the AWC for the 3- 6 years – olds.
4. Environmental hygiene. The AWC has a fairly clean area. No garbage. Proper storage space. Clean cooking area. Adequate space. No open drains. Usually the opposite is true!
5. Type of flooring. A mud or kucha flooring is an open invitation to soil transmitted-helminthic diseases.

III. PROCESS INDICATORS:

1. **Overall :**
   - (i) Efficiency of Delivery
   - (ii) Efficiency of Coverage
   - (iii) Efficiency of Participation.

2. **Food :**

(i) Percentage efficiency of **Delivery of the Food** (RTE of donated food such as Corn-Soya Mix) from the point of Manufacture to the point of receipt in the quantity required, in good condition, and when required (time frame) to the AWC.

(ii) Percentage efficiency of **Coverage** of the Registered Beneficiaries (0-1, 1-2, 2-3, 3-4, 4-5 and 5-6 years) for the 300 feeding days. (A regular beneficiary can be defined as one who gets the ration more than 15 days/ feeding month).

(iii) Percentage efficiency of **Participation** of the Registered Beneficiaries (0-1, 1-2, 2-3, 3-4, 4-5 and 5-6 years) for the 300 feeding days.

3. **NHE/ Growth Monitoring:**

(i) Percentage efficiency of **Delivery** of Flip Charts/ Demonstration Materials/ Weighing Scales (in working order), Growth Charts, Registers etc. from the CDPO's office to the AWCs on time, in good condition and in adequate quantity.

(ii) Percentage efficiency of **Coverage** of Parents of the registered children (fathers should be involved too), for NHE, GM and Demonstrations. This should be done for the 6 age segments of registered beneficiaries.

(iii) Percentage efficiency of **Participation** of the Registered Beneficiaries e.g. the Mothers and/ or the Fathers.

4. **Safe Water:**

Percentage availability of safe drinking water at the AWC and the child's home (?)

5. **Health:**

1. Immunization :

(i) Percentage efficiency of delivery by health personnel. Also vaccines/ equipment etc. in good condition (cold chain), adequate quantity and on time for immunization of the 0-1 year age group.

2. Health Checkups:

(i) Percentage efficiency of **Delivery** by the Health Personnel with equipment on time to give a health checkup to every enrolled beneficiary once a year at the AWC.

(ii) Percentage efficiency of **Coverage** all the enrolled beneficiaries.

(iii) Percentage efficiency of **Participation** for the Health Checkups by the children

3. Referral:

(i) Percentage efficiency of **Referring** the ill child with escort to the PHC or District Hospital.

(ii) Percentage efficiency **of Participation** of taking the sick child to the hospital.

4. Management of Common Illness/ FP Demand:

(i) Percentage efficiency of **Delivery** of common drugs or other materials in good condition, on time and in adequate quantity to last for 2 months, to the AWC. The drugs like Albendazole/ Mebendazole, ORS, Paracetamol, Chloroquine, Cotrimoxazole (Antibiotic), Oral contraceptive pills, Condom packets, Vitamin A bottles, IFA tablets (Large and Small) etc.

(ii) Percentage efficiency of **Coverage** of beneficiaries in the last 2 months.

(iii) Percentage efficiency of **Participation** of the beneficiaries in the last 2 months.

5. Deworming Tablets: Please see above.

6. Health and FP Education:

This is not given in the ICDS but should be.

7. Other Related Materials:
   (i) Percentage efficiency in delivering, covering and participation for iodized salt in the past 2 months.
   (ii) Percentage efficiency in delivering cooking utensils, volumetric measures, serving dishes etc. on time, in good condition once a year.

IV. IMPACT INDICATORS AND THEIR MEASUREMENT:

1. **Nutrition Component:**
   (i) Anthropometriy : Weight-for-age and length-for-age in the 'Below Threes' once in 3 months. Weight-for-age and height-for-age in the 'Above Threes' once in 6 months. Compare with IAP standards.
   (ii) Dietary : Spot Check on separate days to assess how much raw ration is cooked/ child/ day. Separately assess what is actually consumed by the 6 age segments. If 'take-home' the same procedure is to be used.
   (iii) Clinical : By standard methods. Pale conjunctiva (almost white) for IDA. Night blindness, conjunctival xerosis (wrinkled conjunctiva) and Bitot's spots for VAD.
   (iv) Biochemical : Try and do a Hemoglobin test by the Direct Cynmeth method (Oser, 1976). Most of our population group would have Hb value less than 11g/ dl (WHO cut off).
   (v) Knowledge, Attitude and Practice : In child-care by Focus Group Discussions or Participatory Research Assessment, questionnaire.

   Obviously, if the impact indicators (I) to (v) above **improved,** and the 2 clinical signs of IDA and VAD **decreased,** the subject's Nutritional Status **would improve.**

2. **Health Component:**
   (i) Immunization : Percentage reduction in the prevalence of cases of polio, TB, Measles, Whooping cough among the ICDS enrolled children (0-6 years). Information can be collected from the Registers by Surveys or by PRA>
   (ii) Percentage improvement in the prevalence of healthy children (0-6 years) in the annual health checkups. Information can be collected as stated above.
   (iii) Referral: Percentage decrease in the referral of cases in the past one-year. Measurement. Sources of information as in (1) and (2).
   (iv) Management of common illness: Percentage decrease in the referral of cases in the past one year. Measurement/ sources of information as in (1) and (2).
   (v) Deworming : Percentage decrease in the referral of cases in the past one-year. Measurement/ sources of information as in (i) and (ii).
   (vi) Health and FP Education : Percentage increase in KAP.

3. **Hygiene:**
   (i) Safe water : Percentage AWCs having safe water (tap, borewell). Measurement through microbiological testing.
   (ii) Toilet : Percentage AWCs having toilet and if so if it is clean. By direct observation.
   (iii) Personal hygiene: Percentage children who can be said to have a decent level of personal hygiene (bathed, combed, no lice in hair, no scabies, cut nails etc.). Direct observation and recording in each of the 6 age segments, especially the '3-6' category.
   (iv) Environmental Hygiene : Percentage AWCs having a fairly decent level of environment hygiene. Percentage in a fairly clean locality, no garbage/ litter, sufficient space (indoor and outdoors) etc. Direct observation and recording.

(v) Kucha/ Puccka flooring: Percentage AWCs having Puccka flooring. Direct observation and recording. There is a direct relationship between kucha flooring and intestinal helminthic infections (10).

Evaluation Design:

Several Evaluation Designs are possible. However a Pre-Post cross-sectional Evaluation Design is the most simple and cost effective. For instance, ICDS and non-ICDS areas can rarely be matched for even the simplest of socio-economic parameters.

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PART TWO

IMPLEMENTATION STRATEGIES

Chapter One	:	Programme Organization and Management
Chapter Two	:	A Strong Awareness Campaign (Especially at the District Level)
Chapter Three	:	An Improved Nutrition Health Package for the Under Twos
Chapter Four	:	Self-Help Groups (SHGs) of Women to make Supplementary Foods for the 3-6 Years Age Group in the ICDS
Chapter Five	:	The Adolescent Girls in the ICDS
Chapter Six	:	The Pregnant/ Lactating Woman in the ICDS
Chapter Seven	:	Safe Water At All The Project AWCS
Chapter Eight	:	Mass Deworming of All ICDS Beneficiaries
Chapter Nine	:	Enrichment or Fortification of Double Toned Milk with VitaminA in All the Dairies of Karnataka
Chapter Ten	:	A Multinutrient Tablet Including Iron, Folic Acid, Vit. A, Vitamin-C and Vitamin B-12 For All Pregnant/ Lactating Women In The ICDS of the Pilot Districts
Chapter Eleven	:	Enriching Ragi Atta with an Add-On of 6 Micronutirents
Chapter Twelve	:	(i) Drying/ Dehydration of Fruits/ Vegetables in the Glut Season. (ii) Better Storage of Perishables at Point of Harvest (iii) Development of a Simple Cooling Box.
Chapter Thirteen	:	Use of Double Fortified Salt
Chapter Fourteen	:	Deworming + Vitamin A + Iron + Iodised Salt for All Schoolers

7. IMPLEMENTATION STRATEGY/ IES

Overview/ Summary:

Based on the Situational Analysis (**Chapter 3, Part One**), the Strategies/ Types of Interventions would cover **all avenues of nutritional status improvement in the vulnerable groups, namely:**

Chapter One: Organization and Management

Chapter Two: Launching a strong Awareness/ IEC/ NHE campaign from August 15, 2000 regarding the Pilot Study at **all levels** from the State Capital (Bangalore) to the Pilot-Study Anganwadis/ Communities. Apart from the mothers – fathers , fathers-in-law and other caregivers will be included for NHE **(Refer Chapter 3, Part One).**

Chapter Three : It would be evident from the Situational Analysis **(Section3),** that the **'Under Twos' have to be given the maximum importance.** However, the 2-3 year old child is also very undernourished and will be included in the **special category group.** They will receive exactly **what the 'Under Twos, receive.**

Chapter Four: Self-Help-Groups of Women, who could make local recipes such as rotis, usals, ragi muddes, laddus, dry snacks etc could be set up. The Ready-To-Eat Products could be transferred to the near-by ICDS for all **vulnerable-groups except for the 'Under Threes'.** The 'add-on' of micronutrients at the last step of production, will be tried here. The district will be Gulbarga only.

Chapter Five : The **Adolescent girl** will receive a multi-vitamin-mineral tablet to cover her micronutrient deficits. She will be included in the bi-annual deworming campaign. She will also receive focussed NHE as to how to improve her own health/ nutritional status; as also that of 5 children (6 months to 24 months) she will be responsible for in the 'Take-Home-Ration' (THR). She will ensure that the THR **reaches** and is **consumed in full by** the 'Under Two'. She will be responsible for reducing the 'Sharing Factor'.

Chapter Six: The **Pregnant and Lactating Woman** will receive a fully fortified ration to meet both her macro/ micro deficits in the THR situation. She will also receive the biannual deworming . NHE, Caring Practices and actual Demonstrations will form the plank of her NHE education.

Chapter Seven: Safe water will be provided atleast at the AWCs. Attempts will be made to also provide a toilet at all the AWCs of the 4 Pilot Districts.

Chapter Eight: Mass deworming of all ICDS beneficiaries will be conducted on a campaign mode.

Chapter Nine: Milk dairies will enrich their double-toned-milk (which the poor buy) with atleast 10μg vitaminA/ ml. If vitamin D and E can be added – so much the better. This will be done in the Urban setting only.

Chapter Ten: Distribution of a multi-nutrient tablet including Fe, Folic acid, VitaminC, Vit A and Vitamin B-12 to the Pregnant/ Lactating women and Adolescent Girls.

Chapter Eleven: If possible the ragi atta (widely consumed in Tumkur) will be enriched with an 'add on' of "iron + folic acid + vitaminC" for Tumkur district only. Attempts will be made to encourage "chakki-atta" millers or households to use the 'add-on'.

Chapter Twelve: Karnataka is a 'Horticulture State'. Steps will be taken in all four districts to dry/ dehydrate the surplus vegetables/ fruit crops in the shade (to preserve the β-carotene and other vitamins) during the glut season and to distribute the same through the Anganwadis to the needy communities at subsidised rates. Also to promote better storage of perishable produce on the field; and the development of a household cooling box.

Chapter Thirteen: Deworming + VitaminA + Iron + Iodized Salt for All Schooler in the 4 Pilot Districts.

Chapter Fourteen: Use of Double Fortified Salt to Chikmaglur District.

CHAPTER ONE: PROGRAMME ORGANIZATION AND MANAGEMENT

1.1. **Introduction :** Thirteen types of strategies, almost all of them to control or reduce overall under-nutrition; and 'Micronutrient-hunger' in the ICDS and/or total populations have been suggested **(Chapter 2 to 14 of Part Two).** Ideally, all the concerned State Level Departments, namely DWCD, DH&FW, the Department of Panchayati Raj (Zilla Panchayats), Civil Supplies, Information and Broadcasting, and the other concerned departments such as Agriculture/ Horticulture and Food Processing Industries **should be coordinated by one Nodal Agency or Department. The Nodal Department would be DWCD of Karnataka at the State Level. At the District Level it could be either the District Collector or the District Level Counterpart of the Zilla Panchayat. Coordination with the NGOs, other SHGs, and Industry is also required.**

1.2. At the Apex Level an Advisory Committee of Ministers of atleast the Minister of Woman and Child (Chair); the Minister of Health and Family Welfare; the Minister of Panchayati Raj and the Ministers of the other concerned Departments with their Principal Secretaries, could be formed. A few eminent experts in Nutrition, Health, Food Technology etc. could also be included. In Year One of the Pilot Study, the Apex Level Committee should meet atleast **once a month** to review Operational Plans, Progress of Implementation, and to decide on which of the 13 strategies should form the core of the Pilot Study.

1.3. A Programme Management Cell (PMC) could be set up, headed by a Senior Officer. He/she will also serve as the Member Secretary of the State Level Task Force. The PMC would function as a part of DWCD and would operate for the entire project period.

1.4. The PMC would have small sections for financial control as well as programme operations with programme co-ordinators to coordinate activities with concerned Departments/ Agencies in the areas of Communications, Training, Pre-Post Evaluations, and Management Information Systems for the major strategies suggested.

1.5. The PMC would produce monthly monitoring reports for distribution to the concerned agencies and the State Level Task Force. The PMC also would prepare an annual consolidated budget and work plan in consultation with the concerned departments, which will provide a consolidated and transparent resource to track programme progress and direction.

1.6. A District Nutrition Committee headed by the DM and consisting of district-level officers of the concerned departments would monitor the progress of implementation every month.

1.7. Insofar as possible, the program would be fully integrated into the normal operations of implementing agencies/ departments. However, in its early implementation stages the programme will require strengthening, initiation and coordination of activities involving a number of departments especially that of DWCD and DHFW.

1.8. The details of the Programme Organizational Chart, the Programme Management Cell, the Plan of Action in Summary and the Budget for the same are attached at Annexure 1,2,3 and 4 of this chapter.

1.9. CARE-India is possibly the most skilled and experienced NGO in the Management of such Pilot Studies. It might be a good idea for DWCD to explore the possibility of their managing the Pilot Programme in Bangalore, Gulbarga, Raichur, Chickmagalur and Tumkur. CARE-India has worked in Karnataka previously with the MDM programme. It has now shifted its focus to the ICDS, where it works in 7 states, namely AP, Bihar, MP,

UP, West Bengal, Orissa and Rajashthan. It is particularly skilled in food commodities procurement, logistical delivery, coverage of target populations by appropriate food delivery systems such as the 'Take-Home' for the invisible Pregnant/ Lactating women and 'Under Threes' of the ICDS. **The 'Take-Home-Ration' (THR) and Integrated Nutrition Health Programme (INHP) are one of CARE-India's most successful innovations in recent years.** It has kept pace with the Computer Age and uses Management Information Systems (MIS) extensively.

1.10. It is beyond the scope of this report to go into details of Program Management. The Program Management Cell when in place may like to consider the following aspects of Programme Mangement.

- Modern management methods in ICDS programmes.
- Maximal utilization of potential or existing resources
- Utilization of PERT as a planning and evaluative tool
- Utilization of manpower and personnel management systems
- Incorporation of modern administrative procedures in training programmes for ICDS and PHC staff
- Motivation of staff to superior job performance
- Utilization of efficient purchasing and procurement methods
- Vital importance of efficient logistical planning in large-scale nutrition and public health programs
- Budgetary control and fiscal management
- Cost-effectiveness and Linear Programing
- Utilization of the Systems approach and MIS in large-scale nutrition and public health programs

Fig 1: Programme Organisation and Management

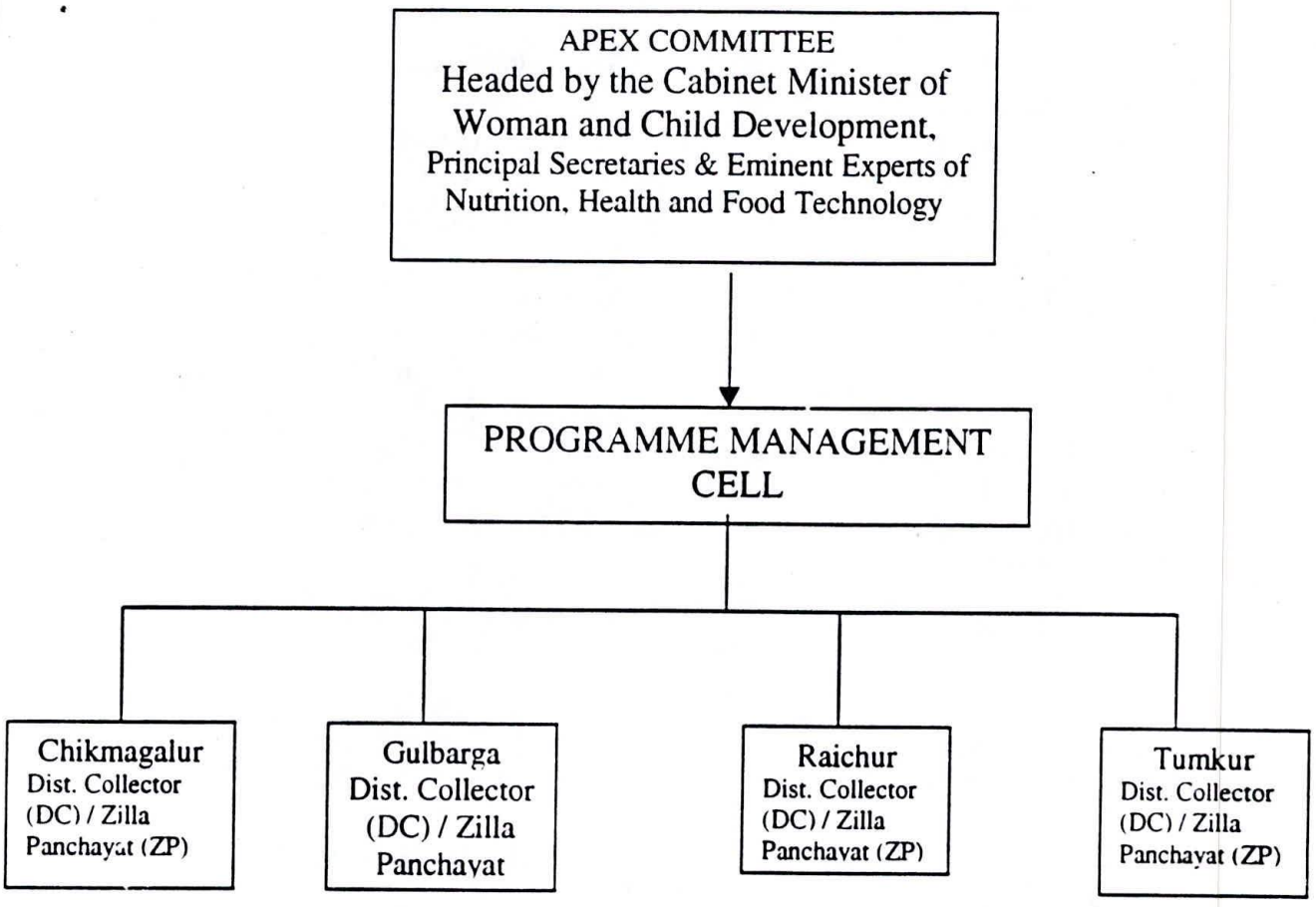
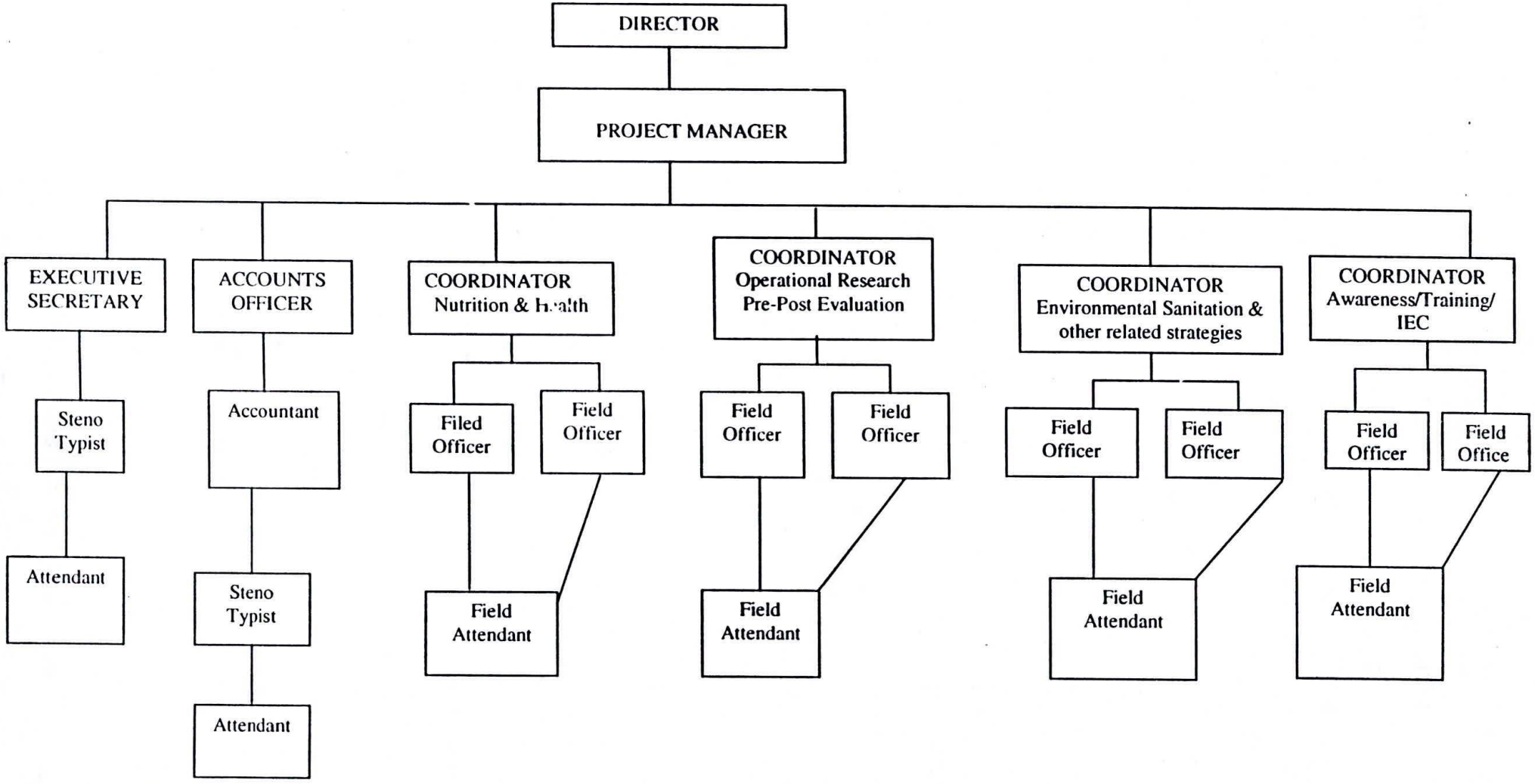


Fig 2: PROGRAMME MANAGEMENT CELL



Source : Adapted from Micronutrient Malnutrition Control in West Bengal, Report of the Task Force Set-up by the Govt. of West Bengal, Social Welfare Dept. 1998.

TABLE 1 : SUMMARY STATEMENT OF PLAN OF ACTION STRATEGIES

S.N	STRATEGIES	CONCERNED DEPARTMENT/S	COST
I.	**Must be done Strategies by DWCD:**		
1.	Awareness Campaign For whole State/ 4 Pilot Districts	DWCD. IB (State) FN Board. DH&FW. Agriculture. Civil Supplies. Food Processing Industries. Education. Private and Public.	Rs. 3 crores
2.	Under Threes in the ICDS of 4 Pilot Districts 2.30.000 Under Threes in the 4 Districts.	DWCD. DH&FW and District Panchayt	Rs. 40 crores
3.	Above Threes in the ICDS of Gulbarga (i) 86,137 'Above 3s' Rounded off to 1.00.000 beneficiaries.(ii) Total No. of ICDS 'Above 3s' = 2.40.000 in the 4 distircts.	DWCD. District Panchayati and the Self-Help Groups of Women (SHGs)	Rs.17.20 crores
4.	Adolescent Girls in the ICDS of the 4 Pilot Districts 46.000 Adolescent Girls	DWCD. FN Board. DH&FW and District Panchayat	Rs. 6 crores
5.	Pregnant/ Lactating Women in the ICDS of the 4 Pilot Districts 1.38.778 rounded off to 1.40.000 P/L beneficiaries	DWCD. FN Board. DH&FW and District Panchayat	Rs. 23.20 crores
II	**Should be done in Collaboration with other Depts.**		
6.	Safe Water and Sanitation in all the AWCs in the 4 Pilot Districts 7168 AWCs in the 4 districts.	DWCD. The District Panchyat. The District level Water and Sewerage Boards	Rs. 14 crores
7.	Deworming of all Vulnerable Groups of the 4 Pilot Districts (About 7 lakh beneficiaries)	DWCD. The District Panchayat and a reputed Private Pharma Cos.	Rs. 4 crores
8.	Fortification of Double Toned Milk with VitaminA in Gulbarga, Raichur and Tumkur for the Open Market All those who buy double toned milk will benefit	Concerned Dairies and Suppliers of VitaminA	Rs. 3 crores
9.	A Multinutrient tablet including Iron. Folic Acid. Vitmain-C and Vitamin B-12 for all Pregnant/ Lactating Women in the ICDS of the Pilot Districs	DWCD. Food Processing Industries. Private & Public. The District Panchayat	Rs. 1.5 crores
10.	Fortifying Ragi Atta in Tumkur District 31,000 Pregnant/ Lactating women	DWCD. Civil supplies. Food Processing Industries. Private & Public. The District Panchayat	Rs. 4.19 crores
11.	Drying of Fruits/ Vegetables During the Glut Season for the open market	DWCD. Agriculture/ Horticulture. The Distrit Panchayat	Estimate cannot be given
12.	Use of Double Fortified Salt in Chikmagalur District or Reputed Brands only	DWCD and Food Processing Indus.rv	Estimate cannot be given
III.	**Strategies that should be seriously considered**		
13.	Deworming + VitaminA+Iron+Iodised Salt for All Schoolers in the 4 Pilot Districts	DW&FW. School Health and Education Department	Estimate cannot be given

Total cost = Rs.127 crores.

Approximate Total Budget Cost to DWCD/DHFW and other Departments for the 2-Year-Pilot Project

- To DWCD - Approximately Rs.90 crores.
  It may be noted that DWCD is already paying about Rs.70 crores for 2 years in the way of Food Supplement alone to its ICDS beneficiaries in just these 4 Pilot Districts.
- TO DHFW - Approximately Rs.14 crores.
- To Sanitation and Sewage - Approximately Rs.14 crores.
- To the 3 Dairies in Gulbarga, Raichur and Tumkur - Approximately Rs.3 crores.
- To FPI and other Departments/ Institutions - Cannot be budgeted at the present time.

The Total Budget is estimated to be **Rs.127 crores** for the Pilot Study of 2 Years duration.

TABLE 2: BUDGET FOR PROGRAMME IMPLEMENTATION CELL

Non-Recurring Costs		Rs.
1. EQUIPMENTS	...	
i. Computer, Laser Printer & Necessary Softwares	...	5.00.000
ii. Fax	...	40.000
iii. Telephone	...	15.000
iv. Photocopier (Digital)	...	3.50.000
v. E-mail Registration & installation	...	4.000
	...	
2. FURNITURE & FIXTURES		5.00.000
3. STATE LEVEL MICRONUTRIENT LABORATORY		50.00.000
Total Non-Recurring Costs		9.09.000
		7.31.80.000
Recurring Costs (Annual)		
	For 2 Years	**For 5 Years**
1. HONORARIUM TO PROJECT PERSONNEL		
i. Director, Programme Implementation Cell – 1 No.	2.40.000	6.00.000
ii. Project Manager – 1 No.	1.92.000	4.80.000
iii. Field Co-ordinator – 4 Nos. x Rs.3.60.000	5.76.000	14.40.000
iv. Accounts Officer – 1 No.	1.20.000	3.00.000
iv. Executive Secretary – 1 No.	96.000	2.40.000
vi. Accountant – 1 No.	72.000	18.000
vii. Computer Analyst – 3 Nos. x Rs.1.50.000/-	1.80.000	4.50.000
viii. Field Assistant – 8 Nos. x Rs.1.20.000/-	3.84.000	9.60.000
ix. Steno-Typist – 2 Nos. x Rs.1.20.000/-	96.000	2.40.000
x. Field Worker – 4 Nos. x Rs.60.000/-	96.000	2.40.000
xi. Office Attendant – 2 Nos. x Rs.60.000/-	48.000	1.20.000
Sub-Total Recurrent Costs	21.00.000	52.50.000
2. OFFICE ARRANGEMENT		
i. Space Hire Charge (Rs.15.000/-p.m.)	72.000	180.000
ii. Electricity (Rs.5.000/-p.m.)	24.000	60.000
Iii. Phone, Fax & E-mail (15.000/-p.m.)	72.000	180.000
3.TRAVEL & TRANSPORT		
i. Vehicle hire charges including P.O.L. (3xRs.20.000x12)		
ii. TA/ DA	40.000	100.000
Sub-Total Recurrent Costs	3,28.000	820.000
4. OPERATIONAL & MAINTENANCE COST OF MICRONUTRIENT LAB INCLUDING STAFF COST	2.40.000	600.000
5. MEETING EXPENDITURE	2.00.000	500.000
6. CONTINGENCY (Post, Telegram, Printing, Stationery, etc. including contingency staff) 10% of Recurrent Cost of (1) + ... + (5)	3,07,000	769,000
Total Recurrent Costs	**3,38,30,000**	**8,459,000**
Total Recurrent Cost for Five Year=5xRs.8.459.000/- = Rs.4.22.95.000 Assuming an escalation of 35% Total Recurrent Cost = 1.25 x Rs.4.22.95.000 = **Rs.5,28,68,750/-** Hence Total Cost = Non-Recurrent Cost + Recurrent Cost = Rs.64.09.000/- + Rs.5.28.68.750/- =		**Rs.5,92,77,750** **Rs.2,37,20,000**

Source : Adapted from Micronutrient Malnutrition Control in West Bengal, Report of the Task Force set-up by the Govt. of West Bengal, Social Welfare Dept. **1998.**

Note : The WB budget is on the Low side. We feel that about Rs.6 crores will be required in a 2-year-Pilot Programme.

CHAPTER TWO: A STRONG AWARENESS CAMPAINGN (ESPECIALLY AT THE DISTRICT LEVEL)

2.1. Introduction: The problem with Nutrition is that though everybody talks about Malnutrition, yet, there is insufficient knowledge about it. Nutrition is our country needs to get the status of Health or Medicine if not IT!

The various activities that might set the stage for the launch of the Pilot Programme on 15th August, 2000 could be as under:

For Information and Broadcasting:

- Accord high priority to awareness generation programmes concerning Nutrition in General and this Pilot Programme in particular.
- Allocate free time for communicating location specific Nutrition Themes/ Messages during **prime time** on Siti Channel (Karnataka), Kaveri Channel (for Karnataka) and on Doordarshan.
- Involve Subject Matter, Advertising Agencies and Communication Experts in IEC programmes.
- Use social marketing strategies for conveying nutrition and health messages.
- Create adequate software to highlight nutrition issues.
- Arrange preparation of various types of programmes on nutrition with special reference to prevention and control of protein energy and micronutrient malnutrition.
- Regularly telecast/ broadcast these programmes for communicating the requisite messages.
- Overview the activities concerning mass-media communication on nutrition through a screening committee.
- Undertake steps for creating nutritional awareness among the people through different units of information and broadcasting like the State F&B Board, Publication Division, Dept. of Advertising and Visual Publicity, Research and Reference Division, Photo Division, AIR, Doordarshan, Press Information Bureau and Directorate of Field Publicity.
- Incorporate nutrition education programmes in Educational Programmes on AIR and in Special Campaigns, Rural Programmes, Educational Programmes and Social Awareness Programmes on Doordarshan.

2.2. Orientation/ Capacity Building/ IEC/ Others

- The various State Level Departments, that is, Woman and Child, Health, Agriculture, Civil Supplies, Food Processing Industries and Education should be oriented **together.**
- Involve IEC Experts to evolve simple frequency and reach messages that will highlight the **plight of the 0-3 years age group.** Highlight that what **everyone** in Karnataka needs is their daily vitamins/ minerals. Highlight that the adults are eating too much of cereals. Highlight that they need to eat much more of pulses. Also seasonal vegetables/ fruits, milk, fat/ oils and flesh foods.
- Doordarshan, AIR, Field Publicity Units, the Press (Vernacular and English) should be involved in a big way.
- Make a directory of media institutions in the capital/ districts that can and should help. Give facts as to how fortification of common man's foods can wipe out micronutrient undernutrition for man, woman and child in a couple of years. Until then support the strategy of a multinutrient tablet for every member of the family. Stress the dire consequences of undernutrition for everyone, **especially the 'Under-Threes' and the Pregnant/ Lactating woman.** Stress the fact that water is food and should be clean. Promote consumption of fermented/ germinated foods.

- Make each District a unit for **accountability for all activities of the Pilot Project,** starting with **Raising of Awareness Levels of Public, Private, NGOs, Funders and the Lay Public, with respect to Nutrition and Health.**
- Print booklets in the vernacular of the district/s based on the Nutrition Component of Karnataka's State Programme of Action for the child and disseminate information widely.
- Involve Milk Dairies, Weaning Food Units, Pharma Companies to create a **corpus fund** to fund the Market and Advertising Research Component of this Pilot Project.
- Approach the IT giants of the State to evolve the software for the Awareness Campaign. Also to form a generous **corpus fund** on a **continuing basis,** to fuel the **Awareness** as well as **other Activities** in this **Pilot Project.**
- Set-up a small secretariat at DWCD (nodal department) to oversee and report progress to the Secretary DWCD and Secretary DH&FW (main actors) once in 3 months.
- Capitalise on the present political will for Good Nutrition for Woman and Child and periodically inform the Cabinet and MLAs.

2.3. Baseline Assessment: Pre –Post Survey will be done by a reputed Market Research/ Advertising Research Organization.

2.4. Type and Number of Beneficiaries: A notational figure of 15 lakh beneficiaries has been taken at atleast 2 members/ ICDS family into approximately 6.5 lakh ICDS families + the ICDS Programme Implementers + others such as the District Panchayats, the District Level Officials and the lay public.

2.5. Time Frame: August 15th, 2000 and continuously till the end of the Pilot Study.

2.6. COST: The estimated cost is **Rs.3 crores** (taken at a notational value of Rs.10/ beneficiary x 15 lakh beneficiary x 2 years). It may be noted that media budgets depend on the frequency, and the length/ duration of the radio/ TV spots used.

15 lakh beneficiaries X Rs.10/ beneficiary = Rs.1.5 crores/ annum or

Rs.3 crores for the 2 year Pilot Project.

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CHAPTER THREE: AN IMPROVED NUTRITION-HEALTH PACKAGE FOR THE UNDER TWOS.

3.1. Introduction:

The Interventions/ Strategies proposed will work within the plus and minus aspects of the ICDS as it exists **now** in 2000AD. Most of the proposed Interventions will ride 'piggy-back' on the existing system.(1-16).

3.2. Specific Intervention and Areas of Operation:

It would be evident from the Situational Analysis (Chapter-3) that the 'Under Twos' have to be given the first priority and maximum importance. Therefore, a package of services, including an appropriate nutrient dense and low-bulk complementary feed will be offered to the mother and child through a 'Take-Home-Package' delivery system operated through the ICDS anganwadis in the 4 Pilot Districts. These are Gulbarga, Chikmagalur, Raichur and Tumkur.

3.3. Details of the Intervention:

The 'Under Twos' in the ICDS will receive a centrally, hygienically and fully fortified complementary or weaning food which will deliver about 400 kcal and their Recommended Daily Allowances (RDA) of vitamins/ minerals in a 100g ration. The ration will also contain atleast 10% of ragi malt powder, or 10% wheat malt powder or 2% barley malt powder – the natural source of α-amylase.

3.4. The Karnataka Agro Corn Industries will deliver this complementary food for the said age-group 3 days in the week. **Specifications will be worked out and open tenders will be called for the other 3 days of the week. Parties who have had a good track record in the production of Weaning Foods will be selected.**

3.5. The **cost of the ration** has been unrealistically low. It will be fixed at **Rs.2/ child/ ration** for a 100g individually packed portion. This will ensure to some extent, more accountability, proper ration size, less pilferage/ leakage and **hygiene.** This will amount to Rs.600/ child/ annum. **There are about 2,30,000 'Under Twos' in the ICDS Pilot Projects. These small beneficiaries should be treated as a Very Special Category and proportionately more should be spent on the them VS the other vulnerable categories.**

3.6. Another Re.1/child will have to be set aside to give the mother of the child **some concrete inputs "To Care With".** For just 50p/ child/ day x 300 ICDS-days, or Rs.150/ child per annum, the mother will receive the following for her child:

- Some common generic drugs such as paracetamol, chloroquine (anti-malarial) cortimoxazole (antibiotic for ARI) and ORS for the Index child (about Rs.40/ annum).
- The mother and child will participate in the Mass Deworming for all vulnerable groups in the Pilot (Rs.10 for 2 times). DWCD may get albendazole for much lower rates from its own Pharma Companies or from LOWCOST, Baroda. Although Zentel (400 mg albendazole sells at Rs.5/ tablet, I have known SmithKline Beecham to have a social conscience. They may give Zentel at much lower rates.
- The mother will receive a one-time plastic volumetric measure to make up the child's feed properly (and not dilute it as the Anganwadi Worker or Care Giver usually do). She will also receive an air-tight container to stock the 15 packets of the child's RTE

ration (Rs.20). The Integtrated Nutrition Health Days (INHP) will be held 2 times a month.

- Another Rs.20/ annum will be set aside for items such as carbolic soap, detergents, washing powder etc.
- She will receive 2 ORS packets if required (About Rs.10).
- The remaining Rs.50/ annum will go into a Corpus Fund, which will be used for emergencies, that is, transportation to PHC/ hospitals etc. This is only for the 'Under Threes' age group.

3.7. The main plank and focus of the Nutrition-Health-Education will be on demonstration of how the RTE is to be reconstituted, feeding demonstrations of infants 6,9,12,15 and 18 months of age. Demonstrations of what medicine are to be administered when and why.

3.8. Important behaviours to address would be child care (exclusive breastfeeding, timely introduction of complementary food, home preparation of appropriate complementary foods, treatment of diarrhea with breastmilk, ORS and improved sanitation/ hygiene. Self-care prior to pregnancy, during pregnancy and lactation, and during the inter-pregnancy period (improved diets for adolescents, more equitable gender distribution of high-quality foods in the household, increased intake of energy and micronutrient-rich foods especially during pregnancy and lactation, delay of first pregnancy or of marriage, and adequate birth spacing)

3.9. Since the Delivery System has to be 'Take-Home', inspite of some sharing of all inputs, this is the only system that reaches the infant/ toddler in his home. Hence, the adolescent girl (hopefully with atleast Primary School education), will be made the Monitor for 5 households having 'Under Twos'. This will not only be Learning by doing experience, but will also limit the "sharing" element. The induction of Adolescent Girls as 'Watch dogs' is an innovation in itself. If may or may not work. But most illiterate mothers **do** respect 'learning' whether the giver is young or old.

3.10. The Schooler (Primary and Secondary Grade) makes the best NHE educator for his family. She/ he should be brought Centre Stage to disseminate and demonstrate to the family simple and double practices. The NHE and IEC reach will be tremendous. Parents do **not** listen to outsiders (the AWW or ANM). They do and will listen to their son or daughter.

3.11. The parents in turn have to make a commitment to feed one banana or some seasonal fruit every day to the **index child** at the very least. They must also commit to give 200ml of milk over and above Breast Milk.

3.12. Lastly, couples that have limited their families to 2 children – should be made much of. In fact only the children of the most fertile age group of '15-24 years' women should be enrolled in the ICDS. Although, hard-hearted, there is not much point in enrolling children from large families. At some point irresponsible parents have to get the message of a "small family norm". This will be a bold experiment in the convergence of Population, Health and Nutrition (PHN).

3.13. Details on how to Implement the Integrated Nutrition Health Days for the Pilot Project:

- The Delivery System has to be a 'Take-Home-Ration' or THR (refer point 2.7).
- Village Community Agents (CCA)/ have to be identified and trained in each ICDS village. These could be the Adolescent Girls.

- **On a pre-set date Health (ANM), Non-Health (ICDS Supervisors), AWW and Helper will meet at the AWC 2 times a month.**
- The Community Change Agents (CCAs) will identify and round up all the eligible 'Under Twos' on the specified day, date and time at the AWC. The Adolescent Girls can be recruited as the CCAs. In a village of 1000, there would be about 45 'Under Twos'. Hence the 45 Mothers with their Index Infant/ Toddler and the Containers for the THR will assemble at the AWC. Each child will be quickly weighed and his weight plotted. The mother will be told where her Index child stands. The mothers/ CCAs will help in distributing the THRs for the Index child only. **The Supplementary Food will be demarcated by colour – so that wrong distributions do not take place.** This will be followed by actual reconstitution and feeding of the RTE to a volunteer mother + volunteer demonstration baby. Proper Volumetric Measures will be supplied to the AWC, for the 'Under Twos'. The Index child will set 15 individual packets of THR rations, one for each day. The mother of the Index child will get a one time plastic box to hold the 15 RTE packets and a volumetric measure for the water.
- Other 'Care Giving' Messages as elegantly enunciated by **Engle (16)** will also form the part of the NHE.
- **On this day, date (usually the 1st and 4th Saturday of the month), the older children will not come to the AWC and will stay at home. The Index child will be in focus.**
- On the other two Saturdays, the same procedure will be repeated for the Pregnant/ Lactating women (Chapter Three and Four).
- The mother has to put down Re.1 for a feeling of ownership; and as a token for paying for services.
- It has worked very well in the 7 States where CARE-India works. Please see Table 3 attached.
- Other 'Care Giving' Messages as elegantly enunciated by Engle (16) will also form the part of the NHE.

3.14. Baseline Assessment Survey:

NIPCCD or a professional agency under the guidance of an evaluation expert in this field will conduct an independent Baseline Assessment Survey. From September 1st to December 1st, 2000. Impressionistic data will be in by 1st January, 2000. Concurrently the same agency will collect and collate data from the ICDS registers of the selected ICDS Projects. (Monitoring or Process for the same period of the Baseline Assessment). Please refer Chapter Seven, for details on Monitoring and Evaluation.

3.15. Time Frame: Intervention should commence form 1st January 2001 to 2003.

3.16. Type and Number of Beneficiaries:

Total no. of 'Under Threes' in Chikmagalur =30,000 (*rounded off to the neaest 10,000)*
Total no. of 'Under Threes' in Gulbarga = 90,000
Total no. of 'Under Threes' in Raichur = 40,000
Total no. of 'Under Threes' in Tumkur = 70,000

2,30,000

Type of Delivery System: It will be closely supervised 'Take-Home-Ration" system. All the 'Under Threes' will get their THR 7 days a week or 365 days/ year. They have to get the other medicines, ORS, deworming etc. inputs described earlier at Rs.100/ annum.

3.17. Cost:

i. The cost of the improved SNP at Rs.2.00/ child/ day x 2.3 lakhs beneficiaries

X 365 feeding days/ year = Rs.16.79 crores/ annum x years = Rs.33.58 crores.

ii. Other inputs such as common medicines i.e., deworming tablets, anti-malarials and ORS packets etc. at Rs.100/ child/ annum = Rs.2.30 crores/ annum x 2years = 4.6 crores.

iii. Cost of the corpus fund at Rs.50/ child/ year x 2 years x 2,30,000 children = 2.3 crores
Total of (ii) and (iii) 6.9 crores.

iv. Approximate cost to DWCD = 33.58 crores
Approximate cost to DHFW = 6.90 cores
Total = 39.48 crores
Or rounded off 40 crores.

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Table 1 : A Ready-To-Reconstitute "Take-Home" ration for children below three years of age, providing about 400 kcal energy + 12g protein for the child, as well as the complete RDA of key micronutrients.

Item	Infants 6-24 months (g)
Ragi or rice flour	60
Green gram flour	20
Sugar	16
Commercial Barley Malt Powder	4
Total*	**100**

* Plus micronutrient mix: calcium (500mg), iron (20mg), zinc (5mg), retinol (500µg), thiamin (0.9mg), riboflavin (1mg), nicotinic acid (11mg), pyridoxine (0.9mg), ascorbic acid (40mg), folic acid (30µg) vitamin B-12 (1µg). (ICMR, 1992).
Manufacturer : Jeevee Foods Pvt. Ltd., Bangalore.

Table 2: A Ready-To-Reconstitute "Take-Home" ration for children below two years of age, providing about 380 kcal energy + 14-15g protein for the child, as well as the complete RDA of key micronutrientss.

	per 100g
Wheat/ maize/ Bajra flour	35g
Malted Ragi Flour	5g
B.G.Dhal flour	12g
Edible Groundnut/ Edible low fat soya flour	17g
Powdered Jaggery	30g
Vitamin/ Mineral Premix	1g
Total	**100g**

Calcium (1gm), iron (40mg), niacin (5mg), vitamin B-12 (0.8µg) , vitamin B1 (0.6mg), vitamin B-2 (0.8 mg), folic acid (10µg), vitamin A (1500 IU)
Manufacturer : Karnataka State Agro Corn Products Ltd.

Note :

(i) The differences in the levels of micronutrients added should be noted. It should be made **mandatory** that **all** Weaning Food/ Complementary Food Manufacturers add the micronutrients as prescribed for a 2-year-old Indian child (ICMR, 1992).

(ii) Although there is **no danger** of any vitamin/ mineral being dangerous/ toxic to the infant/ toddler, at the levels used in either Table 1 or Table 2, we feel a little more uniformity in the micronutrient mixes used, should be insisted upon.

(iii) Manufacturers of such mixes will also find it **much** easier to produce **one mix.** It will also be **cheaper.**

Table 3: Improvement in Selected Nutrition Performance Indicators in CARE-INHP Project

Performance Indicator (Results for Q4-HI)	All States		AP		MP		UP	
	Final 1997	Baseline 1996	Final 1997	Baseline 1996	Final 1997	Baseline 1996	Final 1997	Baseline 1996
Supplementary Nutrition % 6-24 months (past 2 days)	68	41	87	57	NA	11	72	22
Breast Feeding % giving within 6/8 hours	65	35	33	29	NA	66	43	8
Complementary Feeding % 6-10 months giving mushy foods (Amount not specified)	75	46	62	56	NA	49	NA	52

Source: INHP : Integrated Nutrition Health Programme.

CHAPTER FOUR: SELF HELP GROUPS (SHGS) OF WOMEN TO MAKE SUPPLEMENTARY FOODS FOR THE 3-6 YEARS AGE GROUP IN THE ICDS

4.1. Introduction : The self-help-groups of women are not in place. Hence, till they **are,** it will be rather premature to give a strategy for the same. Until such time, the 3-6 year old ICDS beneficiaries in the 4 Pilot Project Districts will receive whatever they were getting to date. The children will also be mass-dewormed twice a year. They will get vitaminA mega dose two times a year.

In Gulbarga a well-known NGO, namely, MYRADA is operating in a big way. Please see Annexure One of this chapter for details as to why MYRADA may be a good choice. It may be noted that MYRADA's largest number of partners are Self Help Groups (3547 out of 5744 partners). Although they have not specifically managed a Nutrition-related-project, their organizational, training and management skills are very evident. It has had the financial support of Ford Foundation, the Swiss Agency for Development and Cooperation (SDC), German Agro Action, CIDA/ HIDA. It has a committed and well-trained staff. It is hoped that they will manage the **SHGs and operate this venture both for the ICDS and the Open market.** In the case of poor income and poor literacy groups, it is the lack of **Numerically,** and the total lack of **Management Skills** that has brought many such ventures to a short and sad end. (Please refer Table one which shows that several such ventures have been tried from village to the Centrally Processed Scale (CPS). It is the CPS that has survived.

4.2 Specific Intervention: A weekly and cyclic menu within the ration limit of 100g of cereal-pulse per beneficiary/ feeding day will be adhered to. These items as well as other items such as sugar, jaggery, condiments and oil will have to be purchased by the SHGs on a 'Micro-Credit System'. Provided they supply **the required quantity as per weekly indent from the ICDS centres, they will be permitted to sell the excess at a higher rate in the open market. The SNP rate per ICDS pre-Schooler (3-6 years) would be the same R.2/ beneficiary/ feeding day.** The emphasis will be **on units of consumption** namely, ladoos, muddes, chappatis, iddlis with much **less pilferage** in this system. It will also free the AWWs and Helpers from the daily and time consuming task of cooking the SNP.

4.3 Micro-credit will be given to the woman at a maximum of Rs.20,000/ enterprise.

4.4. 'Add On' of the Micronutrients:

The RDA of micronutrients for the '3-6 year old' in sachets to **fortify 10kgs of the the said item. (raw ingredients)** will be supplied by a reputed supplier on the oper tender system. This amount will be required per AWC on the assumption that 100 preshoolers will be fed. Since, it is expected that about 80 '3-6 year old's should be at the AWC at the feeding time, 100 ladoos, 100 big chappatis, 100 ragi muddes, 100 servings of upittu, etc will be made. The 'Add On' will be added at the intermediate state (atta dough, iddili batter, ragi mudde; or at the last stage for upittu, ladoo etc.) Although there **will be some loss in the micronutrients,** yet, it is hoped that atleast 30-50% of the much needed RDA, will go into the child.

The expertise of MI in Small Scale Mill Fortification will be utilized.

4.5. Number and Type of Beneficiary:

(i) The '3-6 years old' in the Gulbarga ICDS = 86137
Since, many more than those who should be fed **are fed** in this category, we have rounded off the figure to 1,00,000.

(ii) The total number of 'Above threes' in the 4 Pilot Districts are about 2-4 lakhs in number.

4.6. Time Frame:

January 1st, 2001 to January 1st 2003.

4.7. Cost: Only for SNP (Gulbarga):

(i) One lakh ICDS preschoolers X 300 feeding days X Rs.2/ ration X 2 years = Rs.12 crores. **Only for Gulbarga.**

(i) Common medicines etc. for 4 Pilot Districts (same as for the Under Three) at Rs.100 per child/ annum X 2 Years x 2.40 lakh beneficiaries = Rs.4.8 crores.

(ii) Baseline Assessment and Pre-Post Evaluation = Rs. 10 lakhs.

(iii) Research Studies on loss in Micros by the colleges of Home-Science = Rs.10 lakhs.

(iv) Training and Managerial Costs to Myrada = Rs. 20 lakhs.

Total = Rs. 12 crores + Rs.4.80 crores + 0.40 crores = Rs. 17.20 crores.

Table 1 : Protein enriched RTEs for infants, toddlers and pre-school children at the community and industrial level :

REFERENCE	PRODUCT	INGREDIENTS
COMMUNITY LEVEL :		
1. Pasricha et al (1973)	Ready-to-mix powder	60g cereal (wheat, bajari or ragi) 15g pulse (roasted bengal-gram), an oilseed and 40g sugar/jaggery.
2. Devadas et al (1974)	Weaning mix	Cereal (cholum, ragi or maize), pulse (roasted grrengram or bengal gram dal) oil seed (roasted groundnut) and jaggery.
3. Gopaldas et al (1975)	Poshak (a)	Cereal (wheat, maize, rice or jowar), pulse (chana dal or mung dal), an oil seed (groundnut) and jaggery in the proportion of 4:2:1:2
	Poshak (b)	Same ingredients as Poshak (a) but in the proportion of 60:17:14:9
4. Rau et al (1975)	Extruded RTE	85g corn soya milk (CSM) and 15g salad oil.
5. Chandrashekhara et al (1976)	Kerala indigenous food (KIF)	Tapioca rava, soya fortified bulgar wheat (SFB) rava and groundnut flour.
6. ICMR (1977)	Ready-to-consume mixture	Roasted cereal (cholam, maize, ragi or bajra). Pulse (roasted or sprouted bengalgram, greengram or foxgram), oil seed (groundnut, groundnut/sesame cake flour.)

ANNEXURE ONE (EXCERPTS) ON THE PROFILE OF MYRADA (1999)

MYRADA was started in 1968. In Karnataka. staff has been deputed on a long-term basis to the Women's Development Corporation. Belgaum Zilla Parishad and to Regional Rural Banks. MYRADA has initiated a District strategy through a network of NGOs. and the support of Regional Rural Banks (RRBs) and private institutions to foster Self-Help Groups and to promote Watershed Management and technical support for off-farm livelihood sources. MYRADA has emerged as a major training resource. On average 4700 training programmes are conducted annually, 90% for our people and the rest for NGOs. Bankers and Government officials.

Our Partners:

The following institutions are the primary partners of MYRADA.

Self Help Groups	3547
Watershed Development Associations	129
Apex Bodies	65
Village Development Committees/ Councils	84
School Better Committees/ Parents Teacher Assn	305
Village Water and Sanitation Committees	112
Village Progressive Farmers Association	10
Children's Clubs	261
Village Forest Committees	296
Village Health Committees	18
Others	917
Total	**5744**

Our Staff:

In 1990 MYRADA had 699 staff. The numbers declined to 460 in March 1999. Groups are taking over many of the functions earlier performed by MYRADA. Besides. MYRADA's interventions have become more strategic in recent years; this requires fewer but experienced staff. There are over 1500 volunteers trained in health care. animal husbandry. forestry. literacy and other relevant areas who provide services in project areas. enabling MYRADA to withdraw. 98% of MYRADA's staff come from the rural areas; they are graduates or post graduates. MYRADA has invested over Rs.12 million in training staff during the past 14 years with the support of the Ford Foundation. Swiss Agency for Development and Co-operation (SDC). German Agro Action and CIDA/ HIDA. MYRADA looks for and develops the following qualities in its staff: commitment. professionalism. innovativeness and the ability to work in a participatory manner.

FIVE OUT OF TEN CRITICAL APEAS OF MYRADA RELEVENT TO OUR PROPOSAL

1. **Identifying and fostering affinity groups :** Since 1984-85 MYRADA has fostered SHGs of the rural poor. These groups not only manage credit. they also provide space for the poor to grow skills and in confidence to make decisions regarding their lives.

2. **A focus on women and children:** MYRADA adopts the SHG strategy for women's empowerment and invest heavily in formal and non-formal education for school going children and dropouts. **with a basis towards the girl child.**

3. **District Strategy:** During 1998. the District was identified as a suitable operational area. MYRADA's district strategy (initially in three districts Gulbarga, Chitradurga and Mysore) rests on three thrusts or pillars:
(i) Provision of credit (ii) Microwatershed management (iii) Off-Farm enterprise

4. MYRADA has not actively promoted itself as a **Training Resource.**

5. **Off-Farm IGPs.** MYRADA. like most NGO's. is weak in design and marketing; it therefore linked up with Industries. which provide support in these areas. while it built up the capacity of the poor to cope with organisational demands and quality control.

CHAPTER FIVE: THE ADOLESCENT GIRL IN THE ICDS

5.1. Introduction : This group is not a regular beneficiary of the ICDS. The Pilot Project will for the first time include this age group. To the extent possible school-dropouts (12-18 years of age) will be recruited. About 10 adolescents per village of 1000 population will have to be recruited at the rate of one girl to supervise and oversee the THR of five 'Under – Twos', the Pregnant/ Lactating woman. The girl will receive a token honorarium of Rs.200 per month. The main focus will be on her taking over as a Helper or Anganwadi Worker later on. Capacity building by on the job-training and demonstrations, will be the key in building up her efficiency and confidence.

The Situational Analysis data (1999 NNMB-Repeat Survey Data) show that the adolescent girl is actually consuming more calories than she needs. She is more or less OK for protein and calcium too. However, like the other vulnerable groups, what she needs is more iron, much more vitamin A, a little more of the B-complex vitamins and vitamin C (to enhance her Hb levels). Consequently, she will receive a multi-vitamin-mineral tablet to meet her RDA. She will also receive the bi-annual deworming along with the other vulnerable groups of the ICDS. Since she will be a active helper in the 4 monthly THR days, she will receive practical NHE; and also how to keep her self and her **reproductive health** in better shape.

5.2. Baseline Assessment Survey ;

Since not much information is available regarding this group, a Baseline Assessment Survey will be done from August, 2000 onwards. Impressionistic data should be in by January 2001.

5.3. Time Frame :

The Intervention should commence from 1st January 2001 to 1st January 2003.

5.4. Type and Number of Beneficiarie:

	No.
Adolescent Girl Helper/ Trainees in Chikmagalur	6,000
Adolescent Girl Helper/ Trainees in Gulbarga	18,000
Adolescent Girl Helper/ Trainees in Raichur	8,000
Adolescent Girl Helper/ Trainees in Tumkur	14,000
	46,000

Note: This is based on each Helper/ Trainee being in charge of 5 'Under Threes'. Their mothers will also be supervised. The Trainee has to demonstrate her mettle in ensuring that **sharing** is kept to the **minimum** in the THR situation.

5.5. Cost:

(i) Cost of a complete vitamin-mineral tablet to cover the adolescent's micro-nutrient deficiency at Re.1 per micronutrient tablet X Rs.365 per beneficiary per annum x 2 year intervention x 46,000 beneficiaries = Rs. 3.36 crores.

(ii) Cost of common drugs, cheap yet clean cloth in lieu of sanitary napkins, soap, detergents etc at Rs.150/ Trainee X 2 years 46,000 = Rs. 1.38 crores.

(iii) Cost of Nutrition-Health-Education, On-the-job-training and Capacity Building at R.100/ adolescent girl for 2 years x 46,000 = Rs.92 lakhs.

(iv) Baseline Assessment and Pre-Post Survey = A total Adhoc Grant of Rs.30 lakhs

Total cost of the Adolescent Girls Intervention would be about Rs. 6 crores.

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CHAPTER SIX: THE PREGNANT/ LACTATING WOMAN IN THE ICDS

6.1.Introduction: There would be approximately 1.4 lakhs of Pregnant and Lactating women in the ICDS of the 4 Pilot Districts. These two categories will also be included in the 'Take-Home-Ration' Delivery System.

6.2. Specific Supplementary Food Interventions:
The Pregnant/ Lactating woman is presently getting 140 g of the local cereal with some pulse in the ICDS. However, what she needs to get is **less of cereal**, but her entire RDA of vitamins & minerals. Hence, the 'Take-Home-Ration' can consist of an **energy bar,** made out of the local cereal, local pulse, groundnuts and the 'Add On' of the Pregnant/ Lactating Woman's entire RDA. Thie Energy Bar would deliver 400kcal + 25g protein per feeding day. However, what the Pregnant/ Lactating –ICDS beneficiaries **need even more is their large quota of vitamins and minerals.** Please see ***Table 4*** for the Pregnant/Lactating woman (higher value has been taken) for her 'micro + macro' requirements. The commodity Change Agent (CCA) and/ or the 'Watch-dog-adolescent girl' should try and ensure that the targeted beneficiary consumes **this ICDS supplementary ration,** and does **not** share it with other family members.

6.3. If the woman prefers an "add on of her vitamins/ minerals" to her morning kanjee or tea rather than an **Energy Bar,** this would be infinitely simpler and should be tried out. In this case, she will also receive 3kgs of local staple + 15 sachets of the 'micros'. Since some 'sharing' is bound to take place, at least one can ensure she gets her iron, vitaminC, calcium, folic acid, vitamin B-12 and riboflavin. In short, she will get 6kgs of staple + 30 sachets per month. The Integrated Nutrition Health Days will be held on the alternate Saturdays. As in the case of the "Under Threes", she will bring her containers for the 'Take-Home-Ration' and her one-time-box for the sachets. The AWC will be kept free for the **woman only.** She will put down her Re.1 for services rendered.

6.4. Everything else will be similar as described for the "Under Threes'.

6.5. In the case of the Pregnant/Lactating group, a woman doctor could be in attendance for counselling and for giving specific advice on birth-control. If the woman wants a terminal method (which is what most woman want after their second child) **she should be helped in this.**

6.6. The Pregnant/ Lactating-INHP day can be combined with the sale or the give-away of such medicines/ sanitary requirements specifically required for reproductive health. She would also require common medicines such as paracetamol, anti-diarrhoeals, anti-malarials, ORS, etc as listed for her child. She could also be given carbolic soap (to keep herself clean and for breast hygiene), detergents, washing powder etc. Re.150/ annum can be set aside for the above.

6.7. The mother will also participate in the bi-annual deworming campaign.

6.8. If the woman is a lactating mother, she can receive 2,00,000 IU vitamin A post-partum dose within from 4-40 days of delivery.

6.9. The NHE will be given to her, mostly concentrating on eating **more** home food, doing less hard work, more rest, and 'demos'. The adolescent girls and trained TBAs should **also** attend.

6.10.Baseline and Pre-Post Evaluation:

The same agency that did the Karnataka Nutrition Profile, can be hired to do the above.

6.11.Time Frame : Intervention should commence from 1st January 2001 to 1st Jan 2003.

6.12. Type and Number of beneficiaries by District

Type (P/L)	**Nos.**
Chikmagalur	11165
Gulbarga	63973
Raichur	32981
Tumkur	30959
Total	**1,38,778** or about 1.4 lakh beneficiaries.

6.13. Cost

(i) 1.4 lakhs Pregnant/Lactating women at Rs.2/ feeding X 365 days X 2 years = Rs.20.044 crores.

(ii) 1.4 lakhs Pregnant/Lactating women at Rs.100/ woman/ annum for common medicines/ RCH health/ etc. X 2 years = Rs.2.80 crores. (This will be borne by DHFW).

(iii) Baseline Assessment, Pre-Post Evaluation = Rs.20 lakhs.

Total cost is **Rs.23.20 crores.**

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CHAPTER SEVEN: SAFE WATER AT ALL THE PROJECT AWCS:

7.1. Introduction:
Apart from safe and clean water (atleast for drinking purposes) water is a fundamental and human right. It is also a vital and essential **FOOD.** Consequently, the Pilot Project in the 4 districts with a total **7168 Anganwadi Centres**, will accord **high priority** to atleast (i) one tap for drinking purposes; (ii) one for washing the ICDS utensils; and (iii) one (need not be potable) but plentiful for the pour-bucket-of-water-latrine. All three sources, particularly (i & ii) will be tested periodicaily.

7.2. Baseline Assessmnet: and Pre-Post Evaluation will be done.

7.3. Time Frame: January 1st, 2001 to January 1st, 2003.

7.4. Type and Number of Beneficiaries:

The number of AWCs in the 4 Pilot Project districts are as under:

Chikmagalur	=	1179 AWCs
Gulbarga	=	2350 AWCs
Raichur	=	1304 AWCs
Tumkur	=	2335 AWCs
Total		**7168 AWCs**

7.5. Cost:

(i) It is difficult to assign a cost. An adhoc one time cost of Rs.10,000 for the installation of the 3 taps (probably from a deep bore well) + Rs.5000 for annual maintenance has been provided.

(ii) A cost of R.45,000 for the one time construction of a low-cost, deep pit and pour-bucket latrine will be constructed. Rs.5000/ p.a. will be set aside as maintenance cost.

(iii) Water safety testing kit every year + analyst at Rs.500/ annum/AWC.

(iv) Total cost for the Project Period would be : Capital cost **Rs.1,45,000**
Recurring every year (average) would be : **25,000/ AWC.**

Consequently the one-time cost for 7168 AWCs at Rs.1,45,000 will be Rs.10 crores.

Consequently the recurring cost for 7168 AWCs at Rs.25,000 x 7168/ annum will be 2 crores/ annum or Rs.2 crores for 2 years of Project.

A capital cost of Rs.10 crores to be made.
A recurring cost of Rs.4 crores to be made for 2 years of the Project.

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CHAPTER EIGHT : MASS DEWORMING OF ALL ICDS BENEFICIARIES

Introduction:

Recent studies among Working Girls in peri-urban Bangalore (1), among plantation workers in Chikmagalur District (2) and among school children for free Municipal Schools in Gujarat (3,4,) and elsewhere(5-9) have clearly shown the high prevalence and incidence of **all worms, not only hook-worms,** on negative overall nutritional status, the iron status, and vitaminA status of the vulnerable groups in question.

8.1. Intervention:

(i) **It may be noted from chapters 2,3,4 and 5 that it is intended to cover all the vulnerable groups in all the ICDS Projects for bi-annual deworming.**

(ii) All staff in the ICDS, especially the AWWs, Helpers will also get the treatment along with the ICDS beneficiaries.

(iii) All members of families in the most dis-advantaged sections of a village, where caste is still very predominant, will receive the deworming.

(iv) All members of families (will overlap with iii) in 'kucha' dwellings with mud floors will be eligible for deworming.

(v) The remaining populations will be encouraged to buy the deworming tablets from the open market.

(vi) Deworming has to be done only 2 times a year, 6 months apart. It will be done in the campaign mode. The Panchayat and the ICDS staff will take full responsibility for the deworming campaigns.

8.2.Number and Type of Beneficiaries:

About 10 lakhs in the ICDS (Under 3s, Above 3s, Adolescent girls, P/ L Women) plus all AWWs + disadvantaged families in all the ICDS projects of 4 Pilot Districts.

8.3. Time Frame: Since the **cost effectiveness of deworming is well established** the first campaign could be launched on 15th August, 2000. The next campaign could be planned for February 15th2001 and so on until 1st January 2003.

8.4. Cost of Product and Cost

(i) The approximate number of beneficiaries (ICDS) + staff + most disadvantaged families has been taken to be about 10 lakhs.

(ii) The cost of albendazole in bulk order should not be more than Rs.5/ tablet (400 mg). Again the open tender system will be followed.

(iii) Consequently the approximate cost of this essential intervention will be = 10,00,000 (target population) x Rs.5 (cost of 1 tablet) x 2 times = Rs.1 crore/ annum.

(iv) Therefore for 2 years of the Pilot Project, the cost of the deworming drug will be = **Rs.2 crores.**

(v) Rubber chappals will be sold at subsidizsed cost (cost of subsidy Rs.20/ subject/ year) = .20 x10 lakhs beneficiaries = **Rs.2 crore.**

(vi) The cost of evaluation (by questioning for prevalnence of worms) and by Hb status (Pre and Post) will be included in the evaluations of the ICDS beneficiaries, namely, the'Under Twos', the 3-6 year olds, the adolescent girls, and the Pregnant/ Lactating women.

The Total Cost of the Deworming + chappal intervention will be **Rs. 4 crores.**

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CHAPTER NINE : ENRICHMENT OR FORTIFICATION OF DOUBLE TONED MILK IN ALL THE DAIRIES OF KARNATAKA

9.1. Introduction/ Strategy:

The Situational Analysis has clearly shown that Karnataka as a State is most deficient in VitaminA. On the basis of an average per capita consumption of **50ml a day with 10ug of vitamin A per ml with vitamin A palmitate will deliver 500ug vitaminA/ subject.** The dairies of Gulbarga , Tumkur and Raichur will be persuaded to do this. The three districts have a daily production of about 500 lakh litres/ day. Even at just 100 lakh litres being the daily production of double-toned-milk which is bought by the poor, would be the most feasible method of delivering vitaminA to the needy populations at large. If the ICDS can afford to give the 'Above 3s' atleast 50 ml of double toned milk at the AWCS, this will add a much needed 500µg to the child's everyday diet. Logistics may be the problem.

This will be offered through the open market and **not** the ICDS.

9.2. Baseline Assessment and Pre-Post Intervention Evaluation:

(i) Evaluation of random samples of milk for the vitaminA content/ ml milk. HPLC is very expensive but accurate. CFTRI could be approached. About Rs.6 lakhs.

(ii) A Pre-Post Evaluation could be done by CFTRI. The Market Research by a reputed Technical Agency.

(iii) Cost of Evaluation is relatively expensive, **but necessary** , especially in a newly tested innovation as in the above.

9.3. Number and Type of Beneficiaries: All those who buy the double toned and enriched milk in Gulbarga, Tumkur and Raichur will benefit.

9.4. Time Frame: whenever the dairies are ready to enrich the double-toned milk with vitaminA. Tentatively January 1st, 2000 to January 1st, 2003.

9.5. Cost:

Cost of fortification of 1000 litres = Rs.31
Cost of fortifying one lakh litres would be = Rs.3100
Cost of fortifying 100 lakh litres would be – Rs.3,10,000 (about Rs. 3 lakhs)

This is a relatively small sum, which can be absorbed by the dairies themselves. There would be a problem in acquiring the required amount of vitaminA-palmitate. The Private Sector could donate this.
Total cost plus R & D plus Market Research and Pre-Post Assessment = Rs.3 crores.

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CHAPTER TEN: A MULTINUTRIENT TABLET INCLUDING IRON, FOLIC ACID, VITAMIN-C AND VITAMIN B-12 FOR ALL PREGNANT/ LACTATING WOMEN IN THE ICDS OF THE PILOT DISTRICTS

10.1. Strategy/ Innovation:
The IFA tablet distribution has not been very successful. VitaminC is known to be the most powerful enhancer of Hb status. Hence, a micronutrient tablet, which would include Iron, Folic acid, Vitamin C and Vitamin B-12 needs to be developed.

10.2. Pre-Post estimation of Hb status will be done.

10.3. Time Frame: Two Years.

10.4. Type and Number of Beneficiaries: All the Pregnant/ Lactating women enrolled in the ICDS. 1,40,000 + 46,000 = approximately 2 lakhs beneficiaries in all the 4 Pilot Districts.

1.5. Cost: About 1.5 crores. (DWCD will synchronize, implement and pay).

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CHAPTER ELEVEN: ENRICHING RAGI ATTA WITH AN ADD ON OF 6 MICRO NUTRIENTS

11.1. Introduction/ Strategy:

Ragi is widely consumed in Tumkur District. Ragi flour will be supplied to the 2335 AWCs in Tumkur. An 'Add on' of Iron, Ascorbic Acid, Riboflavin, vitamin B-12 and Folic Acid which are the major (IDA and Vitamin B comlex) micronutrient deficiencies in the State, will be tried on an experimental basis to provide the entire RDA of the Pregnant/ Lactating woman for 7 days a week. Since the delivery system will be a 'Take-Home-Ration' (THR) as in the case of the 'Under Threes', the mothers will receive 200g/ day x 15 days = 3kg of ragi powder. Ragi is the cheapest millet at Rs.4/ kg orRs.24 for 6 kg of ragi powder. The mothers will be taught how to 'add on' as one would , salt to taste at the end of the cooking. It is quite possible that 'sharing' to the extent of 50% will take place. Even so, the Pregnant/ Lactating woman will receive atleast half her RDA. It is now well excepted that dosing of iron even once a week is sufficient to raise Hb levels. Ragi does contain high levels of calcium, which is known to inhibit the absorption of iron. However, to counter this, the packet or sachet will contain ascorbic acid, which is known to be a known enhancer of dietary iron.

The Packets/ Sachets;

(i) A Pregnant woman needs 38mg iron, 600µg vitaminA, 40mg ascorbic acid, 1µg vitamin B-12, 100µg folic acid and 1.5mg vitamin B-2 per day.

(ii) A Lactating Woman needs 38mg of iron, 950µg vitaminA, 40mg ascorbic acid, 1.5µg vitamin B-12, 150µg folic acid and 1.5µg vitamin B-12 per day.

Any fine chemicals/ vitamins manufacturer will be able to make individual packets of the same. Or else the local chakki grinder of ragi flour could be given larger sachets of micronutrients/ kg of the ragi flour to be blended into the ragi flour. The price will be set at Re 1/ RDA of the woman. This would be inclusive of a bio-degradable sachet package.

11.2. Baseline Assessment and Pre-Post Evaluation would be done.

11.3. Number and Type of Beneficiaries: 31,000 Pregnant/ Lactating women in Tumkur District only.

11.4. Time Frame: January 1st 2001 to January 1st 2003.

11.5. Cost:

(i) The cost of the Micronutrient Sachet at Re.1/ sachet x 365 days x 2 years of Project = Rs.730/ beneficiary for the Project.

(ii) Therefore for nearly 31,000 Pregnant/ Lactating women, the cost would be 31000 x Rs.730 = Rs. 2.30 crores.

(iii) Cost of the Ragi Flour at Rs.24/ beneficiary x 12 months X 12 months 2 years X 31000 Pregnant/ Lactating woman = Rs.1.79 crores.

(iv) Pre-Post Evaluation = Rs. 10 lakhs (for IDA and VAD status Pre and Post)

Total of (I) + (ii) + (iii) + (iv) = **Rs. 4.19 crores.**

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CHAPTER TWELVE:

(i) DRYING/ DEHYDRATION OF FRUITS/ VEGETABLES IN THE GLUT SEASON.

(ii) BETTER STORAGE OF PERISHABLES AT POINT OF HARVEST

(iii) DEVELOPMENT OF A SIMPLE COOLING BOX

12.1. Introduction/ Strategies:

Bangalore is a 'Horticulture State'. Steps will be taken in all four districts to dry/ dehydrate the surplus vegetables/ fruit crops in the shade (to preserve the β-carotene and other vitamins) during the glut season and to distribute the same through the Anganwadis to the needy communities at subsidised rates. Also to promote better storage of perishable produce on the field; and the development of a household cooling box.

This chapter will cover strategies for drying of fruits/ vegetables during the glut season; strategies for better storage conditions; and lastly a simple cooling box to save food commodities such as milk, gruels, left over cooked food for atleast 12 hours for the Low Income Group Families.

(i) **Strategies for fruits/ vegetables:**

The simplest method would be to have sufficient space at the point of harvest to set up simple dehydraters to dry the surplus vegetables/ fruits without extensive loss of β-carotene and/ or vitamins. The CFTRI, Mysore could be the Technical Adviser.

(ii) **Strategies for Better Storage Conditions for freshly harvested produce (fruits/ vegetables:**

- Even small storage hut-like containers on stilts will be the first step in saving much of the perishable crop.
- The Indian Council of Agricultural Research has come-up with simple brick-lined storage bins/ containers. More details will be sought from ICAR, who could serve as the Technical Adviser for this porject.

(iii) **A cooling box in lieu of a poor-man s refrigerator:**

Practical and Action-Research needs to be done urgently in this area. A multi-centric-study involving colleges of Home-Science is urgently needed.

12.2. Baseline Assessment and Pre-Post Assessment can only be done after the strategies have been well defined.

12.3. Number and Type of Beneficiaries: Not relevant at this point of time.

12.4. Time Frame: Not relevant at this point of time.

12.5. Cost:

A costing cannot be given as a great deal of preliminary enquiries have to be made.

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CHAPTER THIRTEEN : USE OF DOUBLE FORTIFIED SALT

13.1. Introduction & Rationale : The technology for Double-Fortified Salt is available at long last through the excellent Research done by University of Toronto, Canada and funded by the Micronutrient Initiative Canada. If the technology is made freely available it will wipe out IDA and IDD in entire populations of Karnataka. It will also free the DHFW from the vertical programmes for IDA and IDD. The National Institute of Nutrition, Hyderabad has also had this technology available for some time. Consequently if the Food Processing Industries, the National Institute of Nutrition, MI India, and DWCD join hands this could become a distinct strategy for Chikmagalur District in the near future.

13.2. Chikmagalur District is a plantation district. And is dotted with several large plantations who would like to keep their work force in good health. *(1).* Unfortunately Chikmagalur district is highly endemic for IDD. Please refer to **table 21, chapter 3 of part 1** for further details on the prevalence of goitre. Chikmagalur heads the list with the prevalence of 41% in schoolers and adults. Generally districts which are hills or slopes such as Chikmagalur and Kodugu; or coastal sealine districts, such as D.Kannada and U.Kannada are effected.

A baseline survey report on goitre prevalence in Karnataka by the DHFW-K has pin pointed the reason to be a deficiency of these vital micronutrients namely, iodine, zinc and iron in the soil of these districts.

13.3. The Strategy :

(i) 1 kg of double fortified salts could be sold through the plantations at a heavily subsidised rate *(1)* . For instance if it could be sold at Rs.4 versus R.7, which is the current market rate for iodized salt, it would capture the entire plantation population. It should also be made mandatory that no other types of salt or spurious brands of iodized salt be sold in Chikmagalur District. Concurrently the pricing of double fortified salt should be such that it is 1 rupee/ kilo lower than the cheapest types of rock salt or crystal salt sold in the market. Possible partners in this enterprise could be Hindustan Levers and/or Tata Chemicals.

(ii) The 7 ICDS Projects of Chikmagalur will distribute 1kg packet of double fortified salt per ICDS family per month – **free.**

(iii) All other ICDS services will continue as before.

13.4. Baseline Assessment and Prepost Evaluation :

(i) A Pre-Post Evaluation would be done.

(ii) Continuous testing of the potency of iodine in random samples using kits should also be done.

13.5. Number and Type of Beneficiaries

There are 87627 ICDS beneficiaries in the 7 ICDS projects of Chikmagalur. If one includes adolescent girls we could round off the figure to 1 lakh beneficiaries.

13.6. Time Frame:

1st January 2001 to 1st January 2003.

13.7. Cost:

(i) Double fortified salt is not yet available anywhere in the open market.

(ii) Taking a notational cost of Rs.10/kg of double fortified salt, the cost for 1 lakh beneficiary families x 24 months would be **24 lakhs.**

(iii) **The total cost of project + the Pre-Post Evaluation would be approximately = 50 lakhs. (This cost would be borne by DWCD)**

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CHAPTER FOURTEEN : DEWORMING + VITAMIN A + IRON + IODISED SALT FOR PRIMARY SCHOOLERS (6-15 YEARS)

14.1. Introduction and Rationale :

Schoolers are a population group that are most infected with parasitic infestations. The prevalence of IDA, IDD and VAD is also known to be very high in this population group. Karnataka at the present time has a total population of approximately 60 million. Approximately this would yield a captive audience in the classroom in Karnataka of about 12 million schoolers.

14.2. Strategy/ Strategies:

In Gujarat approximately 3 million schoolers who are enrolled in the MDM programme are dosed with albendazole (400mg) at the beginning of every school term. They are also dosed with mega vitamin-A dose (200,000 IU). It has been mandaotry by the commissionerate of the MDM programme that only iodised salt is used in the Mid Day Meal. Iron tablet (60 milligram elemental iron as ferrous sulphate) is distributed in the classroom by the teacher. This cost the MDM commissionerate only about Rs.11/ child/ year. Since it is the chepest of cheap intervention which can reach and benefit the schooler we would request DHFW to seriously consider this strategy.

The schooler is the only population segment left out of the intergenerational life cycle described in **Part one of this report.** We would urge DHFW to consider synchronising with DWCD and launch this project from January 1st, 2001.

The school child can also be given nutrition-health-education in general and on the importance of micronutrient in particular to keep him/ her physically and mentally active and in a good state of ehalth.

14.3. Baseline Assessment and Pre-Post Evaluation : This will be done. Such an evaluation done on approximately 6000 schoolers availing of the improved MDM programme in Gujarat clearly showed a significant benefit in terms of improved Hb levels, decrease clinical signs of vitamin-A deficiency and decreased prevalence of intestinal worms (1).

14.4. Time Frame: 1st January 2001 to 1st January 2003.

14.5. Cost :

(i) In 1993 the above intervention cost the Government of Gujarat only about eleven rupees/ child/ year.

(ii) Assuming that only 50% of the 12 million schoolers would be in school and eligible for this service, the cost would be as under:

6 million x Rs. 20 (at current cost) / year x 2 years = 24 crores (Will be borne by DHFW).

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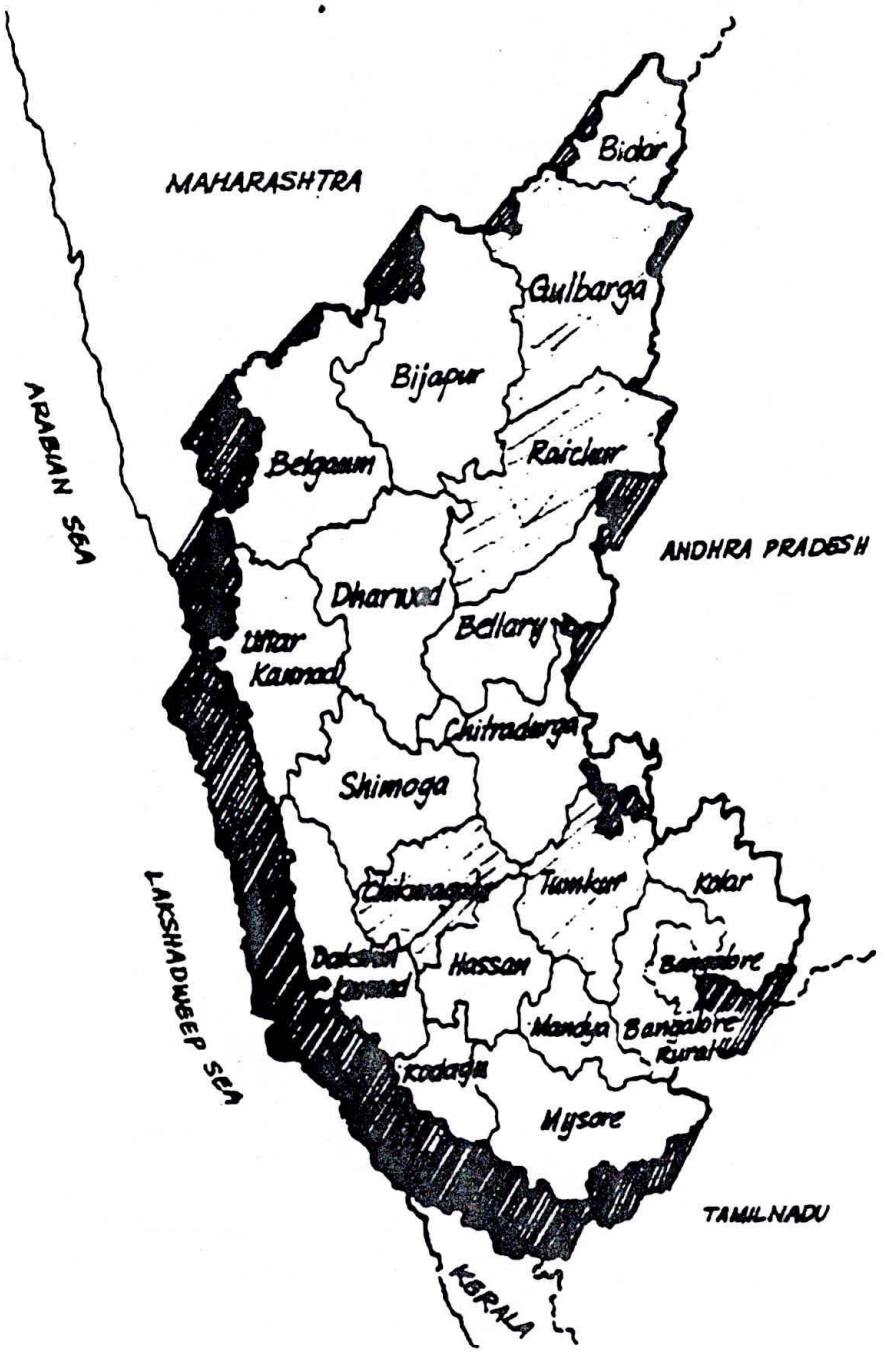
ACRONYMS

AIR	All India Radio
ANM	Auxiliary Nurse Midwife
AWC	Anganwadi Centre
AWW	Anganwadi Worker
BMI	Body Mass Index
BMI	Body Mass Index
CCA	Community Change Agent
CED	Chronic Energy Deficiency
CFTRI	Council Food Technological Research Institute
CSB	Corn Soya Blend
CSIR	Council Of Scientific And Industrial Research
CSSM	Child Survival And Safe Motherhood Programme
DHFW-K	Department Of Health And Family Welfare. Karnataka
DWCD-K	Department Of Woman And Child Development Of Karnataka
EPI	Expanded Programmed Of Immunization
GLVs	Green Leafy Vegetables
GOI	Government Of India
I&B	Information And Broadcasting
ICDS	Integrated Child Development Services
ICMR	Indian Council Of Medical Research
IDA	Iron Deficiency Disorder
IDD	Iodine Deficiency Disorder
IEC	Information Education Communication
IFA	Iron-Folic-Acid
INHP	Integrated Nutrition And Health Programme
IT	Information Technology
KAP	Knowledge. Attitude. Practice
LBW	Low Birth Weight
LBW	Low Birth Rate
LIG	Low Income Group
MDM	Mid Day Meal
MPs/ MLAs	Members Of Parliament/ Legislative Assembly
NCHS	National Centre For Health Statistics. USA
NGO	Non Government Organization
NGOs	Non Government Organizations
NHFS	National Health Family Survey
NIN	National Institute Of Nutrition
NIPCCD	National Institute Of Public Cooperation And Child Development
NNMB	National Nutrition Monitoring Bureau
ORS	Oral Rehydration Solution
P/L	Pregnant And Lactating Women
PDS	Public Distribution System
PEM	Protein Energy Malnutrition
PHN	Population Health Nutrition
PWC	Physical Work Capacity
RDA	Recommended Daily Allowances
RTE	Ready-To-Eat
SHGS	Self-Help-Groups
SNP	Special Nutrition Programme
THR	Take-Home-Ration
UIP	Universal Immunization Programme
VAD	Vitamin A Deficiency
ZP	Zilla Panchayat

KARNATAKA



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