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CHILDHOOD MALNUTRITION AND LANN INTERVENTION: CASE STUDY OF FIVE STATE INTERVENTION AREAS IN INDIA

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ABSTRACT

Higher prevalence of chronic malnutrition in vulnerable and backward pockets of India sets back the pace of inclusive growth in Indian economy. Indian villages consisting of marginalized population in states like West Bengal, Odisha, Jharkhand, Madhya Pradesh and Rajasthan retards the aggregate improvement in development indicators. This is one major reason hindering the achievement of optimal well being at an equitable way. Welthungerhilfe and different non-profit organizations are doing interventions to reduce malnutrition among children and intergenerational transfer of malnutrition through community intervention. Present paper provides the situation analysis evidence of such project to assess the barriers to reduction in chronic malnutrition in order to design the programmatic intervention strategies in the study area. Baseline study was carried out in all the five intervention states as a cross-sectional sample survey covering 400 households with children under the age of two. Along with their socioeconomic and demographic information, data has been collected on morbidity, food security, water, sanitation, hygiene to assess the context. Local hunger Index is created to rank the study areas as per the value of chronic hunger. Different bivariate and multivariate analyses are done using STATA. Baseline study findings show higher prevalence of chronic hunger, moderate to high prevalence of chronic and acute malnutrition, higher food insecurity and significant knowledge-practice gap in childcare and feeding. Widespread multidimensional poverty is prevalent with huge scope to cure the situation with community led intervention and micro planning.

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INTRODUCTION

Child malnutrition is a curse on the developing world children. It implies physical and cognitive growth deceleration that occurs as a response to suboptimal nutrition to maintain equilibrium between genetic growth potential and nutritional intake. Though there have been a substantial economic growth and poverty reduction in the Indian economy, how far such scenario is sufficient to bring better health of child population is questionable (IIPS 2007). If their health and nutritional achievements remain behind then there is a possibility to have negative impact on the economy in the long run since nutritional status affects future productive capacity of individual through physical and cognitive development and thereby control the future earning potential (Dasgupta and Roy 1986, Mahal *et al*. 2001, Linnermayr *et al*. 2008). Existing literature establishes poor children are more malnourished (Navaneetham and Jose 2005). Literatures name this two way relationship as feedback loop of poverty and malnutrition (Deolalikar 2004, Svedberg 2000, Navaneetham and Jose 2005, Hong and Mishra 2006, Svedberg 2008). However, different development agencies and donor organizations are concerned about mainstreaming nutritional interventions in poverty reduction strategies to sustain economic development which is needed to be properly targeted (Shekar and Lee 2006). Human well-being and development are under a threat with millions of children under the age of five are

malnourished, more specifically under-nourished. Malnutrition implying chronic or acute protein and energy deficiency i.e. macronutrient deficiency as well as vitamin and mineral deficiency i.e. micronutrient deficiency - is responsible for 2.2 million deaths and 21 percent disability adjusted life years among children under the age of five in low and middle income countries (Black *et al*. 2008). This paper will investigate how far the knowledge, attitude, practice gap regarding childcare and feeding practice of children, food insecurity are responsible for higher prevalence of chronic hunger and malnutrition among marginalized population subgroup in India.

Background

As indicated in figure 1, chronic childhood malnutrition in India declined by 14 percentage points in a period of twenty years (IIPS 2017).

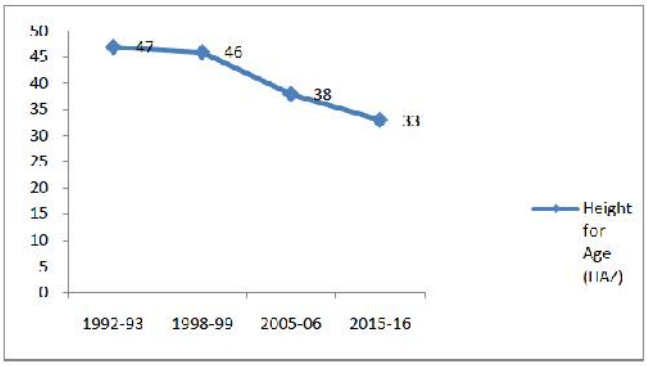

Figure 1. Percentage of malnourished children in India in three time points (1992-93, 1998-99, 2005-06, 2015-16)

underweight children under same population subgroup is 130 million in the developing world (ibid.). It is difficult to achieve a few other goals under Millennium Development Goals if the first goal is not accomplished (UNICEF 2009). So the need of the hour is assessment of the crucial contributors to malnutrition and controlling them through cost-effective interventions. Twenty four countries are burdened with 80 percent of world's childhood stunting and more than 90 percent of developing world's stunted children live in Asia and Africa (Table 1). Among low and middle-income countries, India shares the greatest burden of stunted children (31%) compared to any other. Among other high, medium or low prevalent countries, each of them shares less than 10 percent of total prevalence of developing world. Malnutrition is responsible for a substantial amount of child mortality and morbidity. More than one third of child deaths are due to intergenerational transfer of malnutrition (Caulfield *et al*. 2004). Thirty seven percent of neonatal death is directly related to malnutrition (ibid.). Fifty percent of child deaths from different diseases like Acute Respiratory Infection, Diarrhoea, Malaria, Measles, and HIV/AIDs are indirectly related to malnutrition (ibid.). Among ten developing countries that contribute most of the malnutrition burden, five are in Asia. These countries are India, Bangladesh, Indonesia, Pakistan and Philippines. South Asia is the hub of the most malnourished. Though India does not have the highest prevalence of stunted children, it has the greatest number of stunted children. India thus accounts for more than three out of every ten stunted children in the developing world. In Asia it declined from 44 percent to 30 percent and in Africa overall the fall is from 38 percent to 34 percent (UNICEF 2009). South American countries like Bolivia and South and East Asian countries like Bangladesh, Vietnam, and China had

Table 1. Chronic malnutrition in different developing countries in total developing world

Country	Prevalence	Stunted in absolute number ('000)	% in developing world total (195.1 million)
India	*48*	*60,788*	*31.2%*
China	15	12,685	6.5%
Nigeria	41	10,158	5.2%
Pakistan	42	9,868	5.1%
Indonesia	37	7,688	3.9%
Bangladesh	43	7,219	3.7%
Ethiopia	51	6,768	3.5%
Democratic Republic of the Congo	46	5,382	2.8%
Philippines	34	3,617	1.9%
United Republic of Tanzania	44	3,359	1.7%
Afghanistan	59	2,910	1.5%
Egypt	29	2,730	1.4%
Vietnam	36	2,619	1.3%
Uganda	38	2,355	1.2%
Sudan	40	2,305	1.2%
Kenya	35	2,269	1.2%
Yemen	58	2,154	1.1%
Myanmar	41	1,880	1.0%
Nepal	49	1,743	<1%
Mozambique	44	1,670	<1%
Madagascar	53	1,622	<1%
Mexico	16	1,594	<1%
Niger	47	1,473	<1%
South Africa	27	1,425	<1%

Source: UNICEF 2009.

The world Scenario in relation to chronic malnutrition

Long-term deficiencies in nutritional status are indicated by stunting. Underweight or wasting indicates mainly the acute malnutrition i.e. short-term deficiencies. Estimates of UNICEF (2009) show that the global burden of stunting is much higher than that of underweight. The number of stunted children under five years of age is 200 million whereas the number of

shown more than 20 percent decline in stunting during this decade (UNICEF 2009). National Family Health Survey data shows that, stunting prevalence among children in India has declined from 47 percent to 33 percent in last two decades (IIPS 2016).It has long been established that in India stunting is higher among the poor (which is not true for all the developing countries) (e.g. Figure 2). Though poverty is considered as basic determinant of stunting and in last two

decades India experienced a substantial decline in incidence of poverty (as per the evidence from Human Development Report 2011), the prevalence of stunting has been reduced at a lower rate compared to the rate of poverty reduction. Given this backdrop, Welthungerhilfe has taken initiative to eradicate stunting and other indicators of malnutrition from different developing countries following a unique approach of community led intervention.

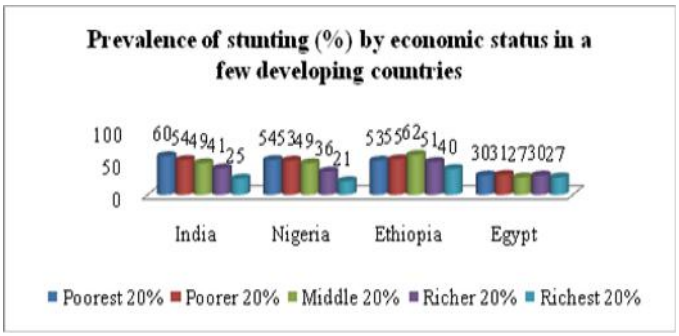

Figure 2. Inequality in nutritional status by economic quintile

Indian context

The Welthungerhilfe is executing Participatory Learning and Action approach to implement LANN in India which is a new initiative with respect to methodology to improve the nutritional status of poor and marginalized population through enhancing the cropping pattern, utilization of natural resource and behaviour change. LANN stands for Linking Agriculture with Nutrition and Natural Resource. PLA follows a livelihood approach combined with behaviour change communication strategies to improve the child caring practice and health seeking behaviour through common household decision making model so that malnutrition prevalence can be reduced among children. It also focuses on breaking intergenerational transfer of malnutrition through imparting proper knowledge within communities to take action for providing nutrition across all age groups in a gender unbiased manner so that maternal, neonatal, infant, under five mortality and morbidity can be reduced and adolescent health issues can be taken care of. With this objective, PLA cycles are stressing on imparting knowledge regarding how to progress the agricultural practice through natural agro-diverse resource management involving male earning members of families. One main strategy is increasing the land productivity of food crops instead of cash crops so that the community can be self sufficient in producing food crops. Another way to increase the availability of diverse food crops is increasing knowledge about the utility of uncultivated foods and kitchen garden. To do that PLA cycle starts with exploring community Knowledge, Attitude, and Practice with respect to →

Matrix 1: Determinants of Malnutrition

Determinants of malnutrition	
Management of natural resources	Intergenerational transfer of malnutrition and how it can be broken
Infant and Young Child Feeding	Overall child care
Balanced food in regular diet	Water, sanitation and hygiene
Uncultivated food	Nutrition Garden
Entitlements related to food, health and livelihood	Agricultural practices

With the objective to reduce malnutrition, morbidity and mortality, Welthungerhilfe has adopted the initiative of PLA trainings through mobilizing communities to educate them for taking actions on linking agriculture, natural resource and nutrition (LANN). This study is done to assess the current situation of the intervention area in all these aspects.

MATERIALS AND METHODS

The Study Area

The study area was the intervention area of Welthungerhilfe in India comprising of five states – West Bengal, Jharkhand, Odisha, Madhya Pradesh and Rajasthan.

Data

Data has been collected from programme areas of each block. Data collection has followed stratified random sampling method after rapid listing of households in the study area. For household survey, following method has been used to collect the data. The block was divided into two strata based on the intervention area location of Gram Panchayats. Then villages were divided according to livelihood of inhabitants. The sample size calculation is based on three factors (i) the stunted child population (ii) the desired level of confidence and (iii) the acceptable margin of error. Hence the required sample size has been calculated using the following formula,

$n = \{t^2 \times p(1-p) \times d\} / m^2$, where,
n = required sample size
t = confidence level at 95% (standard value of 1.96)
p = stunting prevalence (0-5 years is 37.4%) (DLHS 4)
m = margin of error at 5% (standard value of 0.05)
d= design effect (taken as 2- the default value)

The total sample size with 10% of oversampling (to cover non-response) is 394. The household head and the caregiver/mother having at least one living child under the age of two in 400 households in the study area were interviewed.

Quantitative study

Household data - to explore the objectives - has been collected to gather information from the same vulnerable area using structured questionnaire. Information on child nutrition and health indicators like malnutrition, Diarrhoea, ARI, sources of treatment for ailing children, knowledge, attitude, belief, practice regarding child feeding, childcare, dietary diversity, crop planning and consumption habit of uncultivated food, barriers to access healthcare has been collected using household structured questionnaire. Information has been collected on family's agricultural practices and livelihood pattern including seasonal migration.

Analytical method

First, qualitative data has been analysed. The collected quantitative data has been cleaned and entered using CSPro/Excel and has been analysed using STATA and ENA software. Bivariate analyses are done to explore the research objectives. Quantitative data analysis has been done to know the cross-tabulation results of outcome variables by background characteristics.

Local Hunger Index

In this study Local Hunger Index is calculated partly following Global Hunger Index methodology. LHI is different from GHI in few aspects.

Table 2. Basic background profile of the study area

State	District	Population	Sex Ratio	Poor Population	Female Literacy Rate	% of agricultural labourer	% of women married before 18 years of age	% of institutional delivery
West Bengal	South 24 Parganas	8,161,961	956	44	71.4	19.9	29.1[d]	67.7[d]
Jharkhand	Deoghar	1,491,879	921	58.7	51.8	38	55.2[e]	16.2[e]
Odisha	Rayagada	967,911	1051	72.5	39.2	53.1	35.2[e]	18.1[e]
Madhya Pradesh	Khargaone	1,873,046	965	15.4	53	47.6	27.6[e]	66.0[e]
	Panna	1,016,520	905	47.6	54.4	46	32.5[e]	38.0[e]
Rajasthan	Banswara	1,797,485	980	35	43.1	21.8	35.1[e]	46.7[e]

a=Source: Census 2011; b= Planning Commmission 2010, c = Economic Survey 2010, d = DLHS 4, e = DLHS 3

Table 3. The Target area under study

State	Jharkhand	Jharkhand	West Bengal	Odisha	Madhya Pradesh	Rajasthan	5 States
District	Deoghar CWS	Deoghar PRABHAH	24 Parganas	Rayagada LIVING FARM	JANSAHAS a. Khargone b. Panna	JANSAHAS Banswara	6 Districts
Block	Devipur	Sonaray-thari	Joynagar II	a.Bissamcuttack b. Munniguda	a. Jiraniya b. Powaii	Anandpuri	8 Blocks
Population of block	107.015	76.116	239.918	134.729	317.762	122.550	998.090
Targeted communities (Panchayat)	5	5	2	11	6	12	41
Targeted villages (old + new)	42 (27+15)	50	16	100	50	45 (0+45)	303
Targeted population persons / families)	23.979 / 4.085	15.693 / 2.860	49.338 / 12.394	27.000 / 5.000	54.953 / 8.146	10.972 / 7.641	181.935 40.126

- LHI is prepared according to Indian study area context. Since chronic malnutrition prevalence is very high in intervention areas and one major focus of Welthungerhilfe is working on stunting, so to create LHI stunting has been taken to reflect childhood malnutrition instead of underweight.
- Adult malnutrition has also been considered to prepare LHI where only BMI of mothers of young children has been taken to capture the intergenerational transfer possibilities of malnutrition.
- Only 0 to 2 years aged children are considered in the study.
- Instead of child mortality, the child morbidity has been taken to reflect the vicious circle of low food intake, unhealthy environment and morbidity which aggravates chronic malnutrition and increases the existence likelihood of hidden hunger (Heller and Drake 1979).
- Perception about length of hungry season has also been considered to indicate perceived hunger of the study sample.
- Cropping pattern has been included to reflect the actual food availability in the study area.
- The variables used in creating the index show good scale reliability (coefficient value 0.63). Using factor analysis procedure, the LHI scores are estimated.

Against this background of the whole intervention area incorporated in the Baseline study, the paper will now discuss the baseline situation of the five state intervention areas with respect to knowledge-attitude-practice of childcare and feeding, food security, malnutrition and hunger.

RESULTS

Situation in the study area

Welthungerhilfe intervention through BCC on knowledge, attitude and practice of childcare and feeding combining structure of agricultural practice change and natural resource management is successfully hitting the three layers of determinants of malnutrition. Current study tries to assess the pace of progress with respect to different dimensions of intervention.

High prevalence of chronic hunger is evident in the intervention focus area. Factors leading to chronic hunger in the study area are

- Chronic poverty coupled with livelihood insecurity,
- outmigration leading to insufficient earning and dependency on borrowing,
- landlessness,
- less knowledge of preserving uncultivated forest food for lean period

Higher malnutrition prevalence across the study area along with persistent chronic hunger, limited acceptability and physical inaccessibility to healthcare

- Across all the states, prevalence of three malnutrition indicators – stunting, wasting, and underweight – are very high.

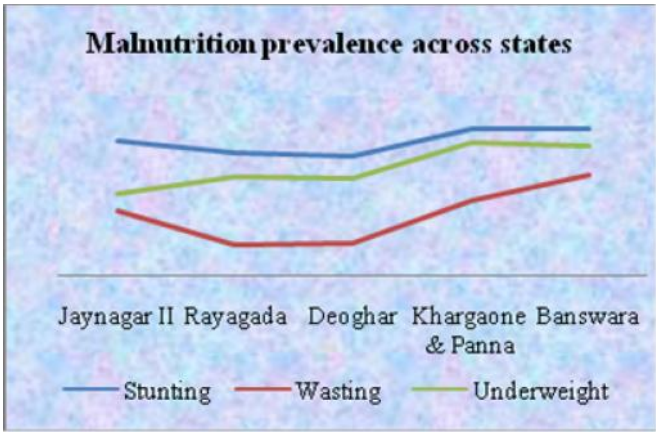

Figure 3: Malnutrition situation in the study area

Moderate knowledge about factors and symptoms of malnutrition

In four out of five states, knowledge about symptoms of malnutrition is very poor. Odisha intervention area shows moderate knowledge level in this aspect. Moderate knowledge level is evident with respect to malnutrition-morbidity association and intergenerational transfer of malnutrition from mothers to children in all the states. Lower awareness about need of care for children aged one to five years and no awareness about adolescent nutritional need is evident in the study area.

EBF and CF knowledge level is high, practice of CF and continuation of EBF is driven by tradition

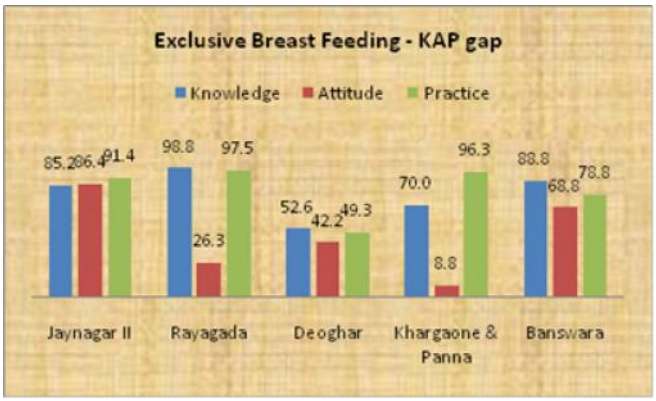

Figure 4. KAP gap in exclusive breastfeeding

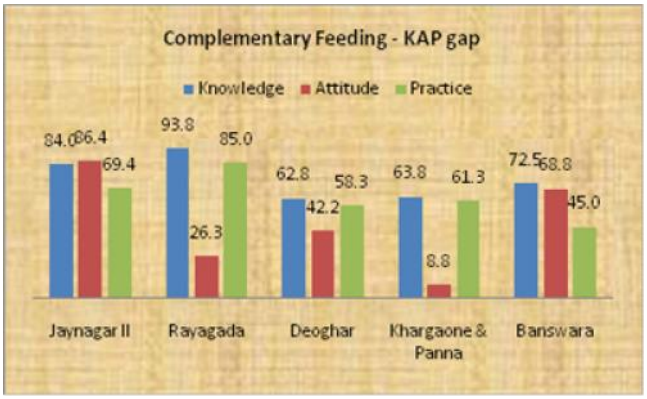

Figure 5. KAP gap in complementary feeding

Knowledge about EBF and CF is better than other issues; but practice is much lower and mainly driven by tradition in all the intervention area. More awareness needs to be generated on complementary feeding practice in all the states. In Jharkhand, knowledge and practice improvement is required more in Sonaraithari compared to Devipur. In Madhya Pradesh, quantitative evidence showing moderate practice of EBF in reality cannot be termed as exclusive because focus group discussion exposed feeding water along with breast milk is a common practice before six months of age. In summary, Welthungerhilfe is successful in increasing the knowledge in relation to EBF and CF in the study area though there is much scope to increase the awareness in varying degree and converting the knowledge into practice is need of the hour.

Gender inequity is prominent in stunting but initiation of intervention phase influenced to reduce the gender gap in childcare – reflected in acute malnutrition: Gender bias is moderate in all the study area which is revealed in quantitative study mostly but qualitative study reveals that food insecurity during lean season increases gender bias disfavouring girls. Such context is retarding the proper provision of nutrition to infants and young children.

Respondents are to some extent aware about the role of nutritious food and uncultivated food in reducing malnutrition: Awareness about food diversity is poor to moderate. Limited number of caregivers are aware about hand washing and sanitation practice. Mono-crop (sometimes duo-crop) cultivation with lack of water for irrigation in most of the states, dependence on borrowing for food, and no or little storage of uncultivated food make them food insecure.Knowledge about preserving uncultivated food for hungry season and extra nutritional care requirement for pregnant woman and lactating mothers has improved to some extent. Practice of CF and EBF explains the stunting prevalence of children in the study area. Poor CF practice should be rectified to reduce malnutrition. Practice of kitchen garden just started to flourish as visible from the study.

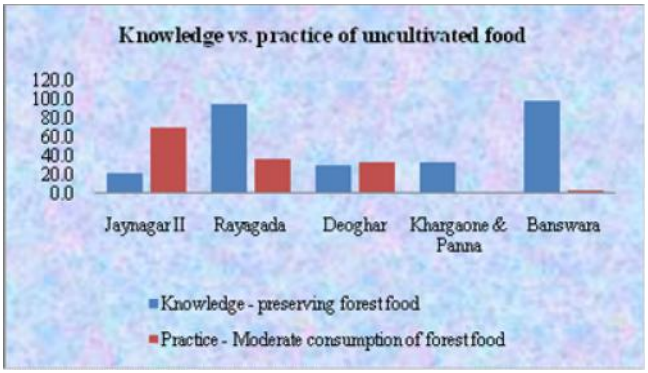

Figure 6. Knowledge – Practice gap in the use of uncultivated food

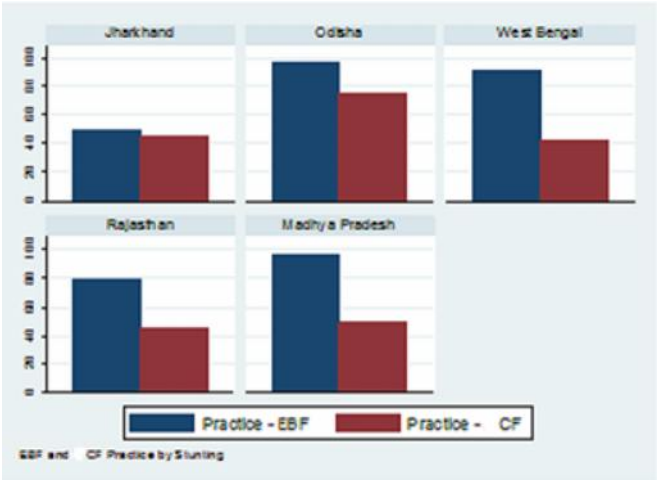

Figure 7. Practice of EBF and CF across states

WASH practice is very poor mainly among SC and minority community

It should be noted that though the impact of intervention has accelerated pace, knowledge and practice with respect to WASH are poor. Awareness of hygiene is moderate with varying degree across states. Practice of drinking water, hygiene and sanitation is worse. Most of the households defecate openly.

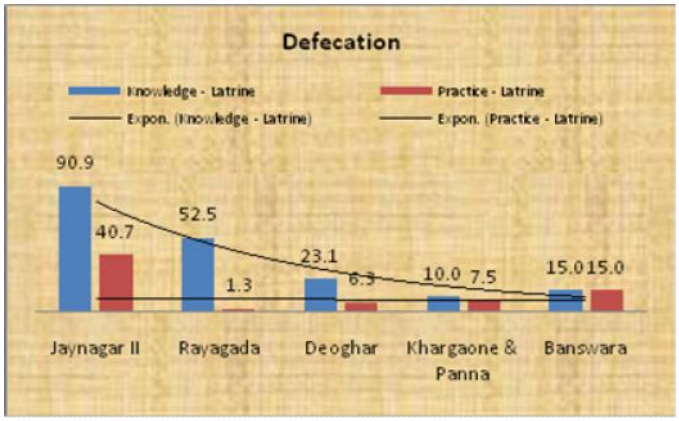

Figure 8. WASH practice in the study area

Dependency on kitchen garden needs to be increased with proper water availability

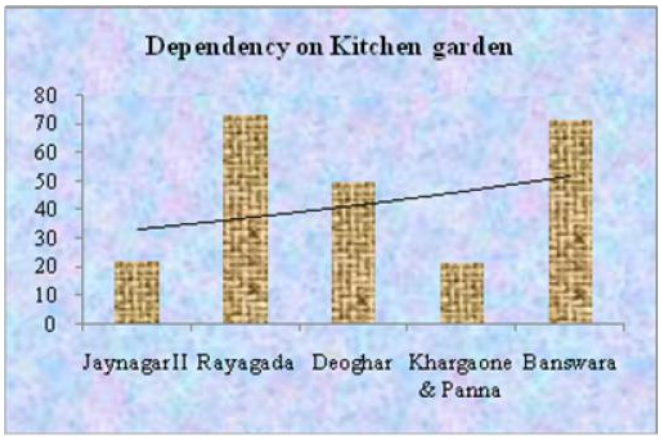

Figure 9. Dependency on kitchen garden across the study area

Kitchen garden set up is visible among less percentage of villagers in West Bengal study area because of unavailability of homestead area. In Madhya Pradesh study area water scarcity is retarding the kitchen garden practice.

Side by side, good individual as well as collective irrigation system helped them to start building kitchen gardens successfully. Though GP level variation is there, PLA meetings at current pace of progress is effective in bringing the change. One suggestion would be memorization of previous meeting focus in the first day of meeting is required to assess how far they are following. Monitoring and evaluation at periodic interval will help to accelerate the pace of progress through familiarity with challenges and lesions to overcome them.

Local Hunger Index and Malnutrition status in the study areas

Prevalence of chronic hunger is higher in all the study areas. Density of the distribution shows alarming situation with respect to Deoghar and Khargaone & Panna whereas alerts can be generated for other three areas. Chronic hunger is distributed from +1 to -2 in Jaynagar II and Banswara depicting worse condition of households which is almost evenly distributed within the sample. In Banswara, some of the households are suffering in higher degree compared to other study area. In Rayagada though prevalence is highest, the density is concentrated within -1 to 0 indicating worse condition for particular few groups. Further research is required to identify their attitudinal aspects to accelerate the output driven intervention. In Deoghar and Khargaone & Panna the condition is worst as some of the households fall under the zone 0 to -1.5 and 0 to -2 respectively. So, extreme chronic hunger is evident among them in both the areas. In spite of different interventions at knowledge level the malnutrition prevalence levels are also very high in all the study area and gender differential in prevalence disfavouring girl children is evident in stunting compared to wasting and underweight in West Bengal, Jharkhand and Rajasthan. Wasting and underweight prevalence is higher among girls in Odisha and Madhya Pradesh.

DISCUSSION

The "Fight Hunger First Initiative' in the 2nd phase has emphasis on upscaling and sustaining of the interventions

Table 4. State-wise LHI score estimates in the study area

	Jaynagar II	Rayagada	Deoghar	Khargaone& panna	Banswara
Min LHI score (Worst)	-1.61	-1.59	-1.09	-1.30	-2.36
max LHI score (Bad)	2.31	2.57	2.74	2.51	1.93
Density Estimate	Thick density within -1 to +1	Thick density within -1 to 0	Thick density within -1.5 to +1.5	Thick density within -2 to +2	Thick density within -1 to +1

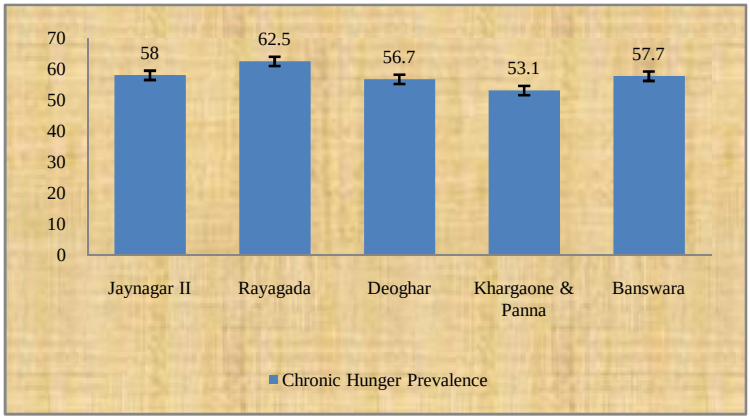

Figure 10. Chronic hunger prevalence with robust standard error estimates in the study area

targeted towards reduction of poverty and hunger. In this phase the main interventions are the selected good practices from the first phase which have proved to be impact oriented and sustainable. These are the Linking Agriculture, Natural Resource and Nutrition (LANN) Participatory Learning and Action (PLA) meetings, village micro planning, Nutrition camps for Global Acute Malnutrition (GAM) children, Child tracking & Screening (0-2yrs), Household Dietary Diversity Score (HDDS) and strengthening of Community Based Organizations (CBOs). The current research is done to guide the intervention through identifying the areas to be focused with the above intervention strategies. In this section, analytical findings are represented with respect to community and intervening partners' outlook.

Higher prevalence of chronic hunger is evident across the intervention blocks. This can be contributed to some major factors – dependency on mono-cropping, lack of purchasing power. Another prime reason is earning members migrating locally to earn more and when they come back spends mostly on luxury commodities other than food. Gender inequity in outcome indicators may be due to the fact that intra-household food allocation is skewed towards male members and boy children that are practiced for long. Recently, after awareness generation programmes and monitoring of childcare by partner organizations, the care for girl children is increasing. But previous gender discrimination practice is reflected in higher gender differential in stunting. Intervention impact is visible in short term indicators of malnutrition as gender differential in wasting and underweight are marginal. Landlessness and outmigration are major factors influencing hunger level in the study area. Male members who migrate for better livelihood options return home once in a year and give a percentage of their income to the family which is much insufficient in amount than which is required for annual household food consumption. Therefore, most of the families depend on borrowing to purchase food from market as mainly they depend on one major crop supported by insignificant production of other crops. Major portion of annual family income is spent to pay the debt amount to moneylenders. In arid and semiarid area, like Deoghar, though everybody has some piece of land, such landholdings are mostly fallow lands. Regarding the response reflecting knowledge level on symptoms of malnutrition, mothers generally report the symptoms which are visible to them. But there is much scope to improve their knowledge from reporting any one symptom to at least any two to three symptoms. Remarkably different impact in Odisha knowledge level is evident as they are running PLA meetings for longer period compared to other study areas.

Moreover, performance of Jharkhand cannot be assessed as the new intervention villages had been incorporated in the survey. Another reason is that the study focused on the children under the age of two. As intervention has been started through engaging and strengthening local CBOs and SHGs who arrange local meetings with caregivers for awareness generation, mostly mothers of younger children stay inside their houses to take care of the young and infant one whereas mothers of elder children are attending the meetings. So the partner organizations have to monitor that inclusion of caregivers of younger children are being ensured before starting any awareness camps and nutrition camps. One midline assessment of these villages may depict the impact of the cycles with time. Less effective adolescent programmes are evident. Though adolescent awareness programmes are running in the villages such initiatives focus adolescent girls as target groups. But such awareness is not permeated into other members of the family or community. Gender bias against girl children is not visible in knowledge due to impact of intervention but previous existence of discrimination is reflected in stunting inequality among boys and girls. According to quantitative study, intergenerational transfer of malnutrition has strong association with stunting in the study area. Qualitative evidence reveals that gender discrimination is evident at adolescent age and intra-household food allocation and neglect of reproductive health issues make them malnourished. This influences the BMI level of young mothers of infants and younger children.Qualitative evidences also reveal that practice of early marriage and consequently early child bearing are widespread in the study areas which are strongly associated with malnutrition among younger children. As for example, in jaynagar II in West Bengal, families prefer early marriage to avoid higher dowry amount andin Deoghar in Jharkhand, the 'Gauna' practice is reduced within communities to lower the expenditure on young married girls which are the major causes of early marriage among less cared adolescents and early child bearing among young married women. Increased knowledge of childcare and feeding in spite of less effective ICDS can be contributed to Government initiative of recruiting nutrition counselors in the study area. Handholding of Welthungerhilfe with Government initiative is helping to strengthen community knowledge through supporting ICDS and intervention activities.

Though majority of the mothers show good knowledge about initiation of breastfeeding and exclusive breastfeeding but if the child birth takes place in other villages and mothers come back with infants after few months, they did not attend PLA cycles due to absence. They follow child feeding practice based on tradition but constitute the population in the LANN village thereby creating bias against impact assessment. Still one major reason behind less practice of imparted knowledge with respect to EBF and CF is that the programme has started awareness generation only for few months, some of the target groups of mothers of infants and young children have not attended the meetings because they stay at home to take care of children and also it will take time to convert the knowledge into practice breaking the tradition of providing honey to infants aged 0 to 6 months and providing breast milk as major diet up to one year or 1 ½ years of age. The PLA intervention cycles must focus on changing attitudes of following tradition in child feeding as it may hamper the sustainability of the programme in the long run. Because if in the medium or long run market access of the community increases due to any livelihood enhancement process, they may convert the practice of infant feeding to other milks in place of EBF because of some visible facts like

- Families are inclined towards spending on luxuries if they get cash in hand
- Already provide honey or water along with breast milk
- ICDS provision of packed food for small children is changing their attitudinal preference towards packed foods

Limited practice of dietary diversity may be due to less idea about importance of uncultivated food or imperfect knowledge about protein availability within easily available fish and availability of other vegetables. As for example, in Rajasthan

study area, communities eat uncultivated vegetable 'Kenkri' collected from forest but do not consider it as uncultivated food and its utility so that it can be preserved for hungry season. In Jharkhand study area, currently consumption of oilseeds has been improved with increased production of it in the locality. The WASH practice is very poor in the study area where communities belong to SC or minority population subgroup compared to ST communities. Majority of them raise livestock near their kitchen which makes the house dirty. Also they use clay or ash for hand washing after defecating in open area.

Figure 11. Kitchen garden in Jharkhand

Kitchen garden initiative is another major part of LANN intervention. In West Bengal only one out of five sample households are practicing kitchen garden due to lack of space to develop. Households who are producing in kitchen garden, most of them produce vegetables for sale. In Jharkhand area, the initiative is successfully penetrating among inhabitants as already 50 percent of the households are doing it though the area of survey constitutes new intervention villages. In Odisha and Rajasthan, success in kitchen garden is due to two different factors. In Odisha community responsiveness is very high, LANN has been implemented for more than one year whereas in other areas the concept is new. In Rajasthan, scientifically improved irrigation technique is helping to produce both in bigger farmlands as well as in homesteads. Welhungerhilfe and its implementing partners are in the process of sensitizing and strengthening CBOs to effectively reach communities. Partner organizations are trying to increase community responsiveness through regular visits and counseling AWWs to increase their accountability which will help to enhance ICDS effectiveness. Girls' Group and adolescent Groups are formed for awareness generation and to spread information to their mothers, elder sisters and sister in laws.

Recommendations and conclusion

Initiative need to focus on several issues when micro level planning will be prepared for intervention. Reducing early marriage, early child bearing to stop intergenerational transfer of malnutrition is most important area of concern. Opportunity costs of social obligations are paid sacrificing child's treatment in distant hospitals or NRC care. Proper local strategies to be built to address this issue. Changing attitudes towards social acceptability of health seeking is required so that people can come out from poverty- malnutrition- morbidity vicious circle across age groups. Addressing issues related to physical inaccessibility to health and nutrition care provided by the Government is needed to increase access to SNP services and group meetings along with other ICDS services. This will help to initiate change in perception and attitude of mothers and caregivers. Sensitization of the mothers to improve the feeding and care of young children with special focus on gender discrimination will bring change in decision making process of intra-household food allocation. Strong monitoring is required to eliminate gender bias in childcare and feeding practice in a sustainable manner to reduce the likelihood of being stunted. Extra care needs to be taken for stunted girl children with zinc supplementation, increased availability of fruits e.g. banana in everyday diet so that stunting can be reversed in the medium run. Quality and quantity of complementary feeding should be enhanced in the study area to reduce malnutrition level.

Most of the poor households feed liquid prepared from millet or similar item in smaller katoris which needs to be changed as well as to be monitored. Proper monitoring of food habits and improvement in dietary diversity is required for adolescent girls, young currently married women, pregnant women and lactating mothers through CBO groups to stop intergenerational transfer of malnutrition. More stress on practice of acquired knowledge with reflection in preservation of uncultivated food, increased dependency on kitchen garden, increased dietary diversity and above all proper start of CF along with reduction of perceived and actual hunger are required. Late start of complementary feeding needs to be addressed through frequent home visits of AWWs within the community. More participation of caregivers in anganwadi meetings, VHND, panchayat meetings must be encouraged. Welthungerhilfe and its partners can run their implementation activities smoothly with proper periodic assessment studies and analyses of intervention aspects. It will help them to address contextual challenges and needs which both the implementers and the receiving communities face during intervention. Such within project monitoring assessments of target oriented result achievements will help to reach the target outcome within time frame.

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Appendix

Effectiveness with time:

Case Study 1 – Rajasthan

Nutrition focused micro planning changes the lives of small farmers in Rajasthan. FHFI – Upscaling best practices

Shantilal, son of ladjiKalsua, living in Tamatiya village in the Ananpuri Block, of Rajasthan, owns a total of 6 bigha of land. In spite of this, the economic condition ofthe family was quite poor. His family, includes his wife, two sons and one daughter. The family used to struggle to feed themselves for nearly 5 months in a year. During the distress periodthey even migrated to Gujarat for work.The family would grow crops, mostly corn, only once in a year, that too with the excessive use of fertilizers. As a result it did not turn out to be very profitable. Besides their own produce of corn they received the wheat distributed from the Government rationing system. The family mostly depended on the market for vegetables and consequently the dietary diversity was low, only limited to cereals and some leafy vegetables.

Supported by the Fight Hunger First Initiative of Welthungerhilfe, his wife became a member of a SHG within the village. She participated in the PLA LANN meetings regularly. From these meetings she learnt about kitchen gardening and sustainable organic farming systems. The family gradually started a small garden on their homestead land. Having learnt about the different schemes under the NREGA the family for the first time actively participated in the Gram Sabha and demanded for support through the village micro planning. Through a government scheme under the horticulturethey received 40 mango saplings. The family now also has started organic manure pits and recycles household waste. The waste water is diverted towards the kitchen. Every bit of resource is now planned and utilized. Today with the kitchen garden they have stopped procuring vegetables from the market and have started growing seasonal vegetables using local seeds. In addition, they cultivate minor millet MAL (Finger millet). The millet is mixed with the wheat flour that they receive from the Public Distribution system (PDS). As a result the food has not only become more nutritious but also economical as they do not have to buy additional wheat. Through this intervention the dietary diversity has also improved. Now the family grows spices like turmeric, coriander and chilies, apart from the cooking oil and iodized salt, all other food is grown on their own land.They started organic farming on one bigha of land and now they are practicing organic farming on the entire land that they own. They don't need to buy chemical fertilizer anymore. This has helped them to save 7500 INR in one season. Shantilal had also demanded for the construction of a cow shed on his own land under the 'Individual benefit scheme' of NREGA. The cow shed has been sanctioned, so he has gained wages as well as reconstructed the shed in a way to collect the cow urine for use as fertilizer and also maintain hygiene. Nobody form Shantilal's family has to migrate out of distress. When we conducted the Household Food Insecurity access Scale (HFIAS), he achieved a score of 5, signifying no food insecurity, though he did mention that he still has to improve his income as it is still a pressure for the family during the festive seasons.

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