

**Assessment of Chakki Owners Perception towards Flour
Fortification Project in Salumbar Block of Udaipur District**

**Dissertation
in
Bhoruka Charitable Trust (BCT), Jaipur**

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**Under the Guidance of
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**School of Rural Management
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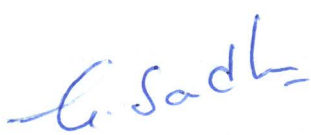
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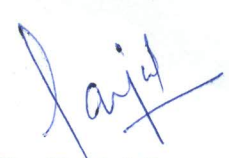
TO WHOM SO EVER MAY CONCERN

This is to certify that **MR. ASHISH SINGH** student of Postgraduate Diploma in Rural Management (PGDRM) from the Institute of Health management Research, Jaipur has undergone internship training at **BCT, Dungarpur** from **3rd March to 3rd April**.

The candidate has successful carried out the study designated to him during internship training and his approach to the study has been sincere, scientific and analytical.

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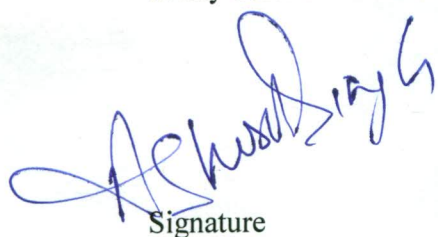
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This is to certify that the dissertation titled **“Assessment of Chakki Owners Perception Towards Flour Fortification Project in Salumbar Block of Udaipur District”** and submitted by **Mr. Ashish Singh Baghela** Enrollment No. 45 under the supervision of **Dr. Tanjul Saxena** for award of Postgraduate Diploma in Rural Management (2012-2014) of the Institute carried out during the period from **3st March 2014** to **3th April 2014** embodies my original work and has not formed the basis for the award of any degree, diploma associate ship, fellowship, titles in this or any other Institute or other similar institution of higher learning.



Signature

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Executive Summary

1. The NGO “Bhoruka Charitable Trust” is working to strengthen the micronutrient among the community of Salumbar block by flour fortification project. Here the key stakeholder is small chakki owners and the community, the end beneficiary.
2. The assessment taken up on the chakki owner perception towards flour fortification project had the following objectives: 1) To assess attitude & behavior of small chakki owners towards fortification of wheat flour under the wheat flour fortification project. 2) Also with the help of chakki owners, To know the perception of the community for use of fortified wheat flour.
3. The convenient sampling technique was used to select the chakki among the village enrolled under flour fortification project. Respondent were the chakki owners.
4. A total sample of 30 chakkis owners was taken as in the study; in which 3 chakki found to be close rest 27 chakkis were interviewed.
5. The study shows that almost all (100 percent) chakkis grinding the wheat and maize. In which wheat is the primary vehicle which followed by maize only in winter session.
6. Data were also analyzed regarding availability of supplies at chakki. The result shows that during assessment hundred percent respondent shows the tin box with a sticker on premix storage, display board and register. However 15 chakki owner use instruction flex for other purpose like to cover the window, gate, premix tin boxes and use as a bed sheet.
7. Out of respondent chakki owner who are aware about fortified atta 10 chakki owner in Salumbar block reported that they do not know the health benefits from the fortified atta. 13 chakki owners explain well about that fortified atta benefits for the pregnant women, lactating female, adolescent girls and old age person among the community. Among thirteen chakkis owner four reported that one micronutrient iron and three reported that micronutrient vitamin B12 is added to fortified atta. Six chakki owners mentioned both micronutrients added for fortification of atta. Not even a single chakki owner mentioned about micronutrient Folic acid during the interaction.

8. It's was found that 21 chakki owner reported that there is awareness among community regarding wheat flour fortification and its benefits. But it was surprising that this awareness in the community, not helpful to do fortification, chakki owner mentioned behind this black spot is the main reason.
9. Data related to a training workshop for miller shows that 22 chakki owners attend the training workshop and it's related to fortification of flour. 21 chakki owner mentioned that they attend two training workshop, but maximum among found second training is not beneficial for the regarding adding premix in wheat flour.
10. On analysis of perspective of miller towards flour fortification project, it is found that 52 percent (approx) chakki owners satisfied towards flour fortification and they do flour fortification in chakki. Rest miller mentioned that in the past they do fortification but customer decrease at chakki due to black spot on roti they stop doing it.
11. All 14 follow the standard operating procedure shared during training. It's surprising that only 3 chakki owner shows interest to continue for flour fortification after the project ends.
12. The study reveals that 423 customer came daily at chakki out it was surprised that daily only 79 customers came for fortification. After probing, it's found that chakki grinds 4070 kg of wheat flour daily which includes only 540 kg of fortified flour per day.
13. Finding of the study recommends that to further maximize the uses of premix in wheat flour it's must to make sure that premix is available at consumer door step. For this small packet of premix can be distributed to each household and to those who own small grinding machine. This will boost up their positive attitude towards fortified atta after usage it daily.
14. Incentive scheme could be developed for users to motivate chakki owners. Awareness and IEC activities like wall painting, puppet show also have to be selected and done according to chakki owner also.

Acronyms

BCT	Bhoruka Charitable Trust
DSC	Development of Support Communication
GDP	Gross Domestic Product
ICDS	Integrated Child Development Services
IEC	Information, Education, and Communication
IIHMR	Institute of Health Management
MDGS	Millennium Development Goals
MDM	Mid Day Meal.
MGNREGA	Mahatma Gandhi National Rural Employment Guarantee Act
MNM	Micronutrient malnutrition
NFHS	National Family Health Survey
NGO	Non-Governmental Organization
NNMB	National nutrition Monitoring Bureau
PDS	Public Distribution System
RDA	Recommended Dietary Allowance
SOP	Standard Operating Procedure
SPSS	Statistical Package for the Social Sciences

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CHAPTER-ONE

INTRODUCTION

1.1. Background

Micronutrient malnutrition (MNM) is widespread in the industrialized nations, but even more so in the developing regions of the world. It can affect all age groups, but young children and women of reproductive age tend to be among those most at risk of developing micronutrient deficiencies. Micronutrient malnutrition has many adverse effects on human health, not all of which are clinically evident. In addition to the obvious and direct health effects, the existence of MNM has profound implications for economic development and productivity, particularly in terms of the potentially huge public health costs and the loss of human capital formation. Worldwide, the three most common forms of MNM are iron, vitamin A and iodine deficiency. Together, these affect at least one third of the world's population, the majority of who are in developing countries. Of the three, iron deficiency is the most prevalent. It is estimated that just over 2 billion people are anemic, just under 2 billion have inadequate iodine nutrition and 254 million preschool-aged children are vitamin A deficientⁱ.

1.1.1 Burden of deficienciesⁱⁱ

(Vitamin and Minerals Deficiencies):-

- Impair millions of growing minds and lower the I.Q level.
- Cause damage to immune systems and death of more than a million children a year
- Causes 300,000 serious birth defects annually.
- Contributes to the death of approximately 60,000 young women a year during the pregnancy and childbirth.

1.1.2 Burden of iron Deficiencyⁱⁱⁱ:-

- Reduce work capacity.
- Impairs a child physical and intellectual development.
- Contributes to 20 percent maternal death.

1.1.3 Burden of anemia^{iv}:-

- 17 percent lower productivity in heavy manual labor.
- 5 percent productivity in manual labor.
- Estimated 4 percent loss of earning due to lower cognitive skills.

In India, currently there is more emphasis on micronutrients as compared to macronutrients. This is because micronutrient deficiencies with respect to iron, vitamins A and iodine deficiency, disorders continue to be major nutritional problems. Micronutrient deficiencies result from inadequate dietary intake, poor absorption of nutrients, excessive losses, increased requirement or a combination of these factors^v.

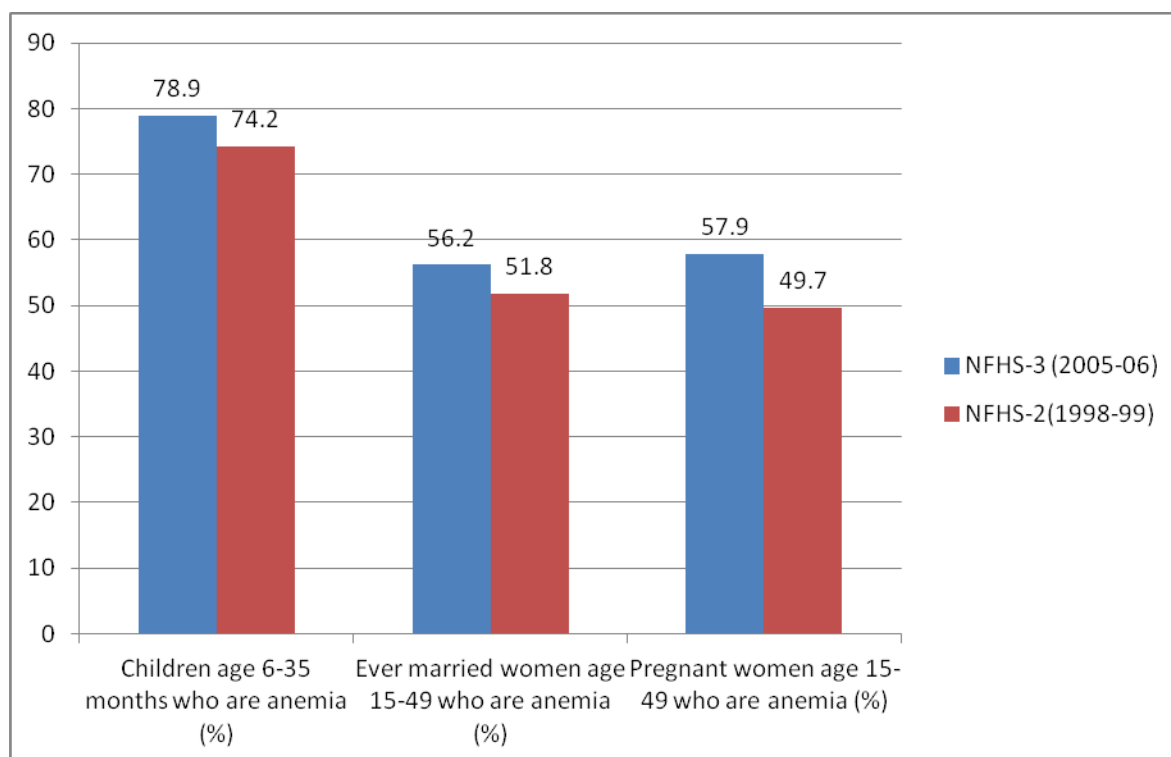
1.1.4 Malnutrition Scenario^{vi}.

Malnutrition is a global issue that affects billions. The term malnutrition refers to both under nutrition and over nutrition. Under nutrition indicates a lack of the necessary energy, protein or micronutrients while over nutrition and obesity mean too much energy, fats or specific micronutrients. Traditionally, under nutrition is prevalent in developing countries and obesity is an epidemic in developed countries. Recently, obesity has increased in developing countries, leading to a double burden of disease, especially in urban settings.

Quick facts and figures about malnutrition around world:

- There are 925 million undernourished people in the world today: one in seven people do not get enough food to be healthy and lead an active life.
- Malnutrition accounts for 11 percent of the global burden of disease. It is the number one risk to health worldwide.
- Each year it kills 3.5 million children under five years old and impairs hundreds of thousands of growing minds.
- Malnutrition is implicated in about 40 percent of the 11 million deaths of children under five in developing countries; lack of immediate and exclusive breastfeeding in infancy causes an additional 1.5 million of these deaths.
- Countries may lose two to three percent of their Gross Domestic Product (GDP) as a result of iron, iodine, and zinc deficiencies.
- Without addressing malnutrition, the world community might not be able to achieve the Millennium Development Goals (MDGS), especially those related to health, hunger, and poverty.

Figure 1 Comparative NFHS Data^{vii}



All India Level data available from NFHS for children age 6-35 months who are anemia indicated that the overall prevalence of anemia is 74.2 percent in NFHS-2 which rise by 4.7 percent in NFHS-3 (78.9 percent). As per NFHS-3, anemia among pregnant women age 15-49 was 49.7 percent. According to the NFHS 2 the overall prevalence of anemia among pregnant women was 51.8 percent.

Ever married women age 15- 49 NHFS-3 (56.2 percent) data increased by 4.4 percent from NFHS-2 (51.8 percent). NFHS-1(1992-93) is not available for above component. 69.7 percent anemia in pre-school children age 6-59 months^{viii}. Thus the prevalence of anemia is high in vulnerable groups (Children, adolescent girls and pregnant and ever married women).

Rajasthan has high level of stunting (40 percent), wasting and under nutrition (37 percent) among children and high prevalence of anemia cutting across all age and income group with 79 percent of children under 3 years, 62 percent pregnant women and even 21 percent men, becoming anemic⁹. From the demographic groups, children from Schedule Tribes had highest prevalence of SAM (8.4 percent) compared to children from Schedule Castes (7.4 percent) and other Backwards Classes (5.2 percent). Approximately 30 percent of all new- born are of low birth weight. The average birth weight still remains at 2.5 to 2.7 kg. Severe malnutrition, prematurity and low birth weights were found to be among the major causes, accounting for 28 percent of the infant deaths. Thus, there is a need to look into the nutritional programs targeting

children, adolescents and pregnant lactating women to make them more effective and bring substantial improvement in the morbidity and mortality indicators in the state^{ix}.

1.1.5 Food Fortification

Food fortification refers to the addition of micronutrients to processed foods. In many situations, this strategy can lead to relatively rapid improvements in the micronutrient status of a population, and at a very reasonable cost, especially if advantage can be taken of existing technology and local distribution networks. Since the benefits are potentially large, food fortification can be a very cost-effective public health intervention. However, an obvious requirement is that the fortified food(s) needs to be consumed in adequate amounts by a large proportion of the target individuals in a population. It is preferable to use food vehicles that are centrally processed, and to have the support of the food industry^x.

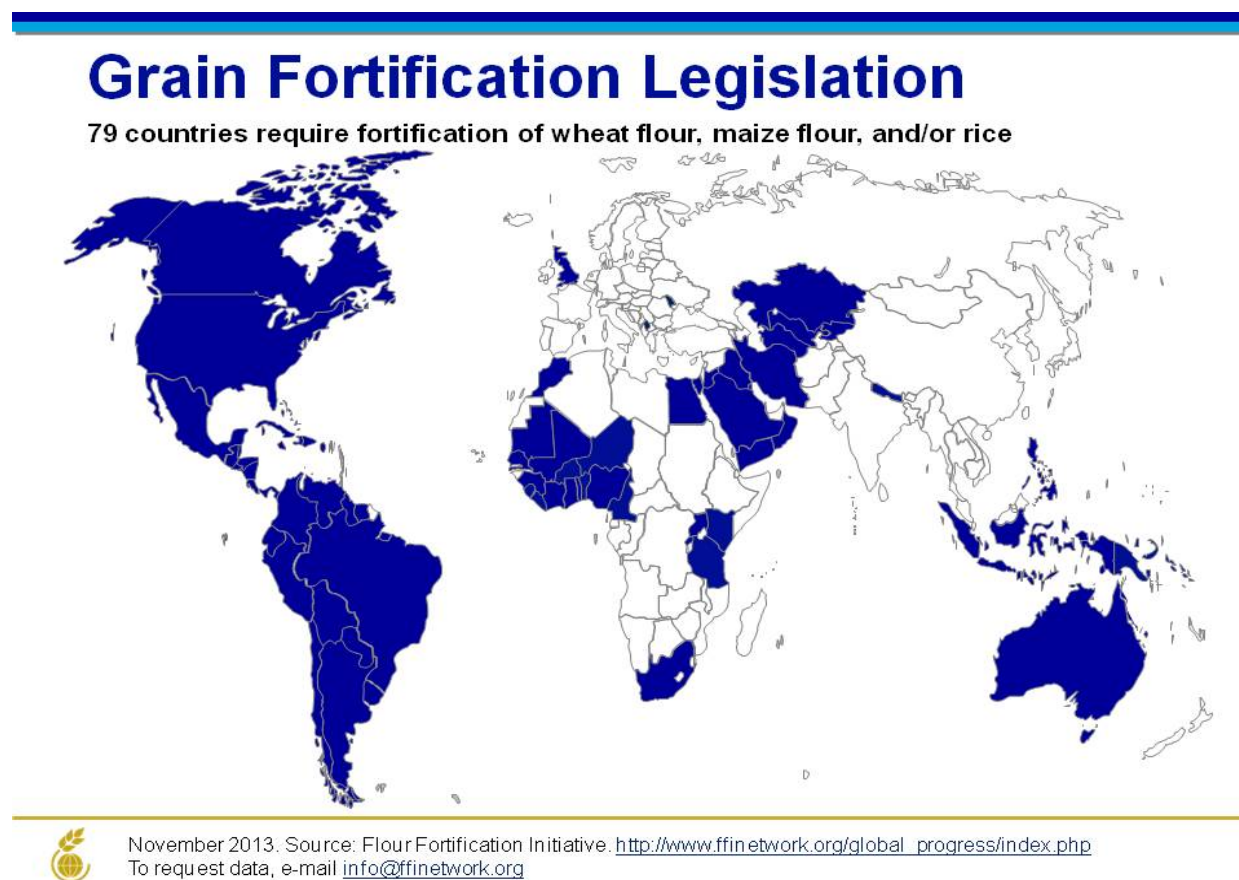
In order to address widespread micronutrient deficiencies, fortification of multiple staple foods (wheat flour, oil, milk and lentils) made available through open market channels, through Public Distribution System (PDS) and also through public funded programs such as the Integrated Development Services (ICDS), Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) and Mid Day Meal (MDM). These are the primary vehicle meant to prevent under nutrition in India.

1.1.6 Global progress in Fortification

Globally 79 countries have legislation to mandate fortification at least one major cereal grain. Of these, 78 countries fortify wheat flour, 12 countries fortify maize products, and 5 countries fortify rice. Costa Rica is the only country that mandates fortification of all three grains, and Papua New Guinea is the only country that requires only rice fortification.

Fortification is mandatory as legislation that has the effect of requiring fortification of one or more type of grain with at least iron or folic acid^{xi}.

Figure 2 Grain Fortification Legislation



1.1.7 Food Fortification Project in Rajasthan^{xii}

GAIN is the executive agency with Institute of Health Management Research (IIHMR) who implementing the Food Fortification Project in Rajasthan. The State of Rajasthan has been selected for this project as it more clearly communicated to the fortification initiative. Project critically identified and selected three food vehicles which are wheat flour, oil and Milk. Production and consumption pattern of these three food products in Rajasthan is the primary reason for selection.

Table 1 Average Daily Per Capita consumption

Food	India	Rajasthan
Wheat	160 g	280 g
Edible Oil	14 g	30 g
Milk	82 g	200 ml

These food vehicles are delivered through diverse delivery channels like Public Distribution System (PDS), Mid Day Meal Scheme, Integrated Child Development Services (ICDS), Dairy Cooperatives, Tilam Sangh and other Market channel.

The goal of Project: To improve the micronutrient status of the general population, especially children, pregnant and nursing mothers through large scale staple food fortification in the state of Rajasthan.

Objective of Project: To reduce micronutrient malnutrition in the state of Rajasthan by making available fortified wheat flour, oil, milk and soyadal analogue through both the open market and government distribution channels.

Various implementation mechanisms opted in order to attain the project goals and objectives as Production and Distribution (P&D), Legislation and Quality Control (L&QC), Social Marketing and Communication (SM&C) and Performance Monitoring and Evaluation (M&E)

1.2 Literature Review

A number of studies have been conducted over the past the past years, examining different components of the various food fortification projects in the country. To a large extent these studies have been undertaken as a part of the monitoring/evaluation exercises; there are, however, a number of independent studies, trying to capture the impact of fortification across various projects. In what follows it was trying to highlight some of the important findings from the existing studies focusing on food fortification projects in the country.

1. Report on Micronutrient Deficiency in India by Padam Singh (2007) analysis of Micronutrient deficiencies in Indian population utilizing the information since 1950 till date. Report critically analyses about the three major micronutrient deficiencies. Inadequacy of iron observed as the root cause for anemia, which leads very little improvement over time. Information from the National nutrition Monitoring Bureau (NNMB) of ICMR indicates that iron intake is much lower for children, adolescent girls and pregnant women. NNMB data indicate intake of iron was 44.2 percent & 40.5 percent of RDA for 1-3 & 4-6 years old respectively and for pregnant & lactating women intake was 36.8 percent and 48.7 percent of RDA respectively. Vitamin A deficiency (Bitot spot) found in preschool children. Average intake of vitamin A is below 50 percent of RDA in most parts of the country. A comparative picture of the prevalence of iodine deficiency disorders and cretinism during 1985-86 and re-surveyed in 1988-99 indicated a declining trend in prevalence of goiter for those years. A number of policy and program efforts have been made for the prevention and control of anemia, but the situation requires consideration of approaches to improve logistics, coverage and compliance of existing programs and

critical need to operationalize policy guidelines on screening and treatment of women and children.

2. Rapid Assessment of Promotion of Fortification of Wheat Flour through Small Millers in Sarada and Salumber Blocks of Udaipur District unpublished report (2014) highlighted the knowledge, awareness and practices of millers regarding fortification and perception of consumers regarding fortified atta. Report assesses that 86 percent chakki owner mention awareness about the training workshop being related to fortification of flour. 93 percent checked owners have a positive attitude towards fortification and 100 percent respondent mention they follow standard operating procedure in flour fortification. The study shows that more than half of the consumers (55 percent) were aware of fortified atta.

Social marketing strategies and distribution of sample packets can strengthen the positive attitude toward fortification. Study focus on interpersonal communication which could be prime important to promote food fortification. The report recommended six strategies a) advocacy at grass root level, b) information, education, and communication (IEC), c) training of program implementers, d) community organizing, d) networking, establishing linkages, and building alliances, e) developing curriculum support in school program and f) development of support communication (DSC).

3. Report on Flour Fortification (2013): Millers and Governments Working Together to Reduce Vitamin and Mineral Deficiencies by Flour Fortification Initiative. The report reveals that progress in fortified flour from industrial mills increased from 18% to 30% and mandatory wheat flour fortification countries increased from 33 to 75 percent. Around combined population of these 75 countries is 2.09 billion. Essential nutrients lost in milling process which leads to burden of vitamin, mineral and iron deficiencies. As the food prices go up impact on nutrition security seems, that's the time fortifying flour puts more vitamins and minerals in staple foods which people continue to purchase and consume during economic downturns. Report forced for making flour fortification mandatory legislation as it can be more easily monitored, provides more equitable access to foods made with fortified flour and reduce the need for expensive marketing campaigns.

FFI's gives the strategies; which include national partnerships support by the offering training and communication expertise, Mobilize global leadership, secure human and financial resources and Monitored fortification programs.

4. Paper on “Nutritional status of affluent Indian school children: what and how much do we know?” By Srihari G, Eilander A, Muthayya S, Kurpad AV, Seshadri S (March, 2007). Paper review on nutritional status of Indian school children 6-18 years from middle & high socio economic status highlighted that the variation in anemia prevalence from 19 to 88 percent among five different states, micro nutrients deficiency based on biochemical parameters & clinical sign of deficiency such as folate, riboflavin, niacin, vitamin C, vitamin A & Vitamin B12. Fruit and vegetable components were comparatively lower than predominant component in children diet like cereal’s pulses milk & milk product. Well designed methodology of the prevalence of micronutrient deficiencies and information on the etiology of anemia among children would be valuable to help understand nutritional status and extent of micronutrient malnutrition.
5. Report on “Impact of a multiple-micronutrient food supplement on the nutritional status of schoolchildren” by Vindo Kumar M and Rajagopalma S (September 27, 2006). Paper reveals the pre and post test design study done on residential school children 5-15 year of age to evaluate the delivery of multiple micronutrient through food route. Mean gains is shown in hemoglobin, serum vitamin A, serum Vitamin E, serum vitamin B12 and serum folic acid after giving nutritional intervention to experimental group (n=211) for nine month and no nutritional intervention to control group (n=202) causes mean losses in hemoglobin and serum vitamin A. study believes that because of small doses of micronutrients added and many time delivery through meal throughout the day was beneficial for providing micronutrient among children.
6. Article on “Supplementation of Micronutrient In Community Micronutrient Deficiency Prevention Programmes” by M.D. Dairo and O.K. Ige (June 1, 2009). Article shows that the food based approach is the recommended strategy for the prevention of micro deficiency. Literature provides the basis for the adoption of supplementation programs in certain circumstances, such as in cases of severe deficiencies. Periodic distribution of high dose vitamin A supplements is the most widely applied interventions with proven effectiveness for treatment prevention & control of Vitamin A deficiency.
Low dose supplement programs designed to reach vulnerable group on a weekly or monthly basis; best implemented through community system.

The paper highlights on those strategies that utilize established accessible, sustainable & culturally acceptable system must be developed to increase the coverage of supplementation programs and its diameter of beneficially.

1.3 Objective of study

This study was aimed to conduct an independent assessment of chakkis owners perception regarding the wheat flour fortification project in Salumbar Block of Udaipur District in Rajasthan.

The following was the objective of the study:-

- To assess attitude & behavior of small chakki owner towards fortification of wheat flour under the wheat flour fortification projects.
- Also with the help of chakki owner, To know the perception of community for use of fortified wheat flour.

1.4 Methodology

In 2011 Udaipur had population of 3,068,420 of which 245,994 (80.17 percent) population lives in rural areas of villages and 608,426 (19.83 percent) population lives in urban areas¹³. Wheat flour fortification covered in two blocks of Udaipur (Salumbar & Sarada) having a total population of 435,872 with having 464 villages in total under 83 Gram panchayat¹⁴. Salumbar block having 269 villages form 46 gram panchayats covering population of 212,492 individuals. This study was completed in the Salumbar Block villages which having 100 chakkis selected for flour fortification project. Project Duration is 01st Sep 2012 to 31st Aug 2015^{xiii}.

1.4.1 Study Design

The Study was conducted in thirteen Villages of Salumbar Block. The study used both qualitative and quantitative methods. Methods include questionnaires for millers during interaction and discussion with them.

Figure 3 Salumbar Block Map



1.4.2 Sampling

Convenient Sampling is done in the villages of Salumbar block. Hundred chakki are enrolled in the wheat flour fortification project in Salumbar block and the study covered 30 percent of total chakkis.

i.e $\{(100 \times 30) / 100\} = 30 \text{ chakkis}$

1.5 Tools and Technique

Interview Schedule for chakki owners was prepared. Through these interviews and interaction, data were collected on the attitude and behaviour regarding fortifying wheat flour in chakki and regarding fortified aata among general populations and chakki owners.

1.6 Sample Size

In order to achieve the study objective data were collected from chakki owner. Convenient sampling technique was used to select the chakki among villages. Through these method small number of targeted chakki to be sampled while providing data which are statistically valid. Targeted was set to cover thirty chakkis form Salumbar block for these thirteen villages was touched and questionnaire was administered form chakki owners. Especially the chakki owner was interviewed while administrating questionnaire. On reaching the village having chakki doing wheat flour fortification, convenient chakki was selected. After seeing name of chakki owner in display board, Chakki owner were invited to participate in the interview. After completing the first chakki, The nearest chakki of same village was approached. The survey proceeded in the same manner till all the wheat flour fortification doing chakki covered in villages. A total of thirty chakkis in the thirteen villages were interviewed.

Closed wheat flour fortification doing chakkis were also include in the study i.e three chakki found closed due to lack of customer, unavailability of electricity and due to flexible timing of opening & closing. The Study was completed by using the same process for the remaining twelve villages.

1.7 Limitation of Study

Study was a time bound activity and data was collected within twelve days. Repeat visit were not possible due to far location of chakki and language gap with chakki owners.

1.8 Data Analysis

All the data were entered, edited and analysis in SPSS statistical software package.

Table 2 List of Respondent Interviewed

S.No	Name of Millers	Name of Villages
1.	Bhawar lal ji Teli	Devgaon
2.	Kanti lal ji Jain	Devgaon
3.	Laxmi lal ji Teli	Kharka
4.	Chaman lal ji Teli	Khraka
5.	Rajmal ji Chaudhary	Karavali
6.	Govind ji Patel	Karavali
7.	Devi lal ji	Karavali
8.	Ruplal ji Patel	Bad Birwa
9.	Khuman Singh ji Chundavat	Majavto ka Guda
10.	Shammu Singh ji	Samoda
11.	Mav ji meena	Samoda
12.	Lalit ji jain	Almoda
13.	Maangi lal ji Teli	Almoda
14.	Shankar ji Teli	Baroda
15.	Panna lal ji	Kharka
16.	Hem raj ji	Kharka
17.	Vali ji kalal	Devgaon
18.	Devi lal ji kalal	Ghaarod
19.	Natu lal ji	Ghaarod
20.	Bhagat singh	Ghaarod
21.	Gautam lal ji	Naya Gaon
22.	Ramesh lala ji	Naya Gaon
23.	Rajesh ji Jain	Kholadi
24.	Shankar lal ji patel	Kaliyo ka Guda
25.	Dula meena	Jalaara
26.	Kachra ji patel	Jalaara
27.	Amrita lal	Naya Gaon
28.	Natu ji	Jalaara
29.	Sharda Sevak	Badi Birwa
30.	Nathu lal ji	Baroda

CHAPTER-TWO

FINDING FROM THE FIELD

The Chapter deals with the findings from the survey of thirty chakki owner residing in the thirteen villages of Salumbar block in Udaipur District of Rajasthan. The chapter presents the attitude and behavior of the respondents regarding food fortification especially fortified Atta awareness regarding projects and benefits from the training workshop. This study also addresses the practices regarding food fortification at chakkis.

2.1. Major Findings

- 2.1.1 Study reflects that a large percentage (90 percent) of respondent chakkis opened during the survey. Due to various other reasons the 10 percentages of respondent chakkis were close, i.e Non-availability of the owner, lack of customer, irregular electricity supply.
- 2.1.2 After probing survey it is found that wheat and corn (maize) are usually consumed by the people in the survey villages and 100 percent respondent deals with both wheat and maize flour. It's noticed by the respondent that community, mainly consumed maize in the winter session.

Table 3 Availability of supplies at miller shops

Availability of supplies at miller shops				
	Description	Total	Number	Percentage
1	instruction flex	N=27		
	Yes		12	44.44
	No		15	55.56
2	Availability of tin box, Display board and etc	N=27		
	Yes		27	100
	No		0	0

2.1.3 Hundred percent respondent chakkis owner shows the tin box with a sticker on premix storage, display Board and register during the survey. The entire respondents mentioned that they store the premix in tin containers and keep the containers in a dry place at normal temperature.

2.1.4 Twelve out of twenty seven chakkis owner shows the instruction flex on wall. Rest chakkis owner use instruction flex for other uses like to cover the windows, gate, premix tin boxes and use as bed sheet.

Table 4 Awareness about Fortified aata (Miller owners & Community members)

Awareness About Fortified aata (Miller owners and Community members)				
	Description	Total	Number	Percentage
1	Awareness among Miller Owners	N=27		
	Yes		23	85.2
	No		4	14.8
2	Awareness among Community Member	N=27		
	Yes		21	77.8
	No		6	22.2

2.1.5 Awareness among the respondent regarding flour fortification project was found to be high in the study area. Finding form the block show that 23 out of 27 respondent heard/ know about the fortification project and related things.

2.1.6 Finding depict that 10 out of 23 respondents in the Salumbar block who are aware about the fortification project reported that they do not know the health benefits of fortified aata. Rest thirteen chakkis owners explain well about the benefits of the fortified aata (i.e health benefit to various age groups) and happy to communicate this to consumers.

2.1.7 Four out of 13 respondents reported that iron is added during fortification of aata, three reported that Vitamin B12 is mixed in fortification of aata and Six respondent aware that both vitamin B12 and iron is added while doing flour fortification.

- 2.1.8 21 respondent (77.8 percent) notices that community members are aware about the wheat flour fortification project and its benefits. Millers mentioned that community member know premix add the micronutrient to their flour but this awareness among them does not show at time of adding premix to their flour.

Table 5 Training Workshop for Millers

Training Workshop For Millers				
	Description	Total	Number	Percentage
1	Training workshop attend by millers	N=27		
	Yes		22	81.48
	No		5	18.51
2	Number of training workshop attend by millers	N=22		
	One training attend		1	4.54
	Two training attend		21	95.45

- 2.1.9 About 22 chakki owners mentioned that they aware about the training workshop being organized related to fortification of flour and they attend it. Out of these about 21 millers (95.45 percent) had attended two training workshops and 1 miller (4.5 percent) attend at one training workshops.

Table 6 Perspective of miller towards Flour fortification project

Perspective of miller towards Flour fortification project				
	Description	Total	Number	Percentage
1	Chakkis doing fortify	N= 27		
	Yes		14	51.85
	No		13	48.15
2	Miller satisfaction towards Food fortification	N=27		
	Satisfied		14	51.9
	Not Satisfied		13	48.1
3	Interested Chakki owner to do FF after project ends	N=14		
	Interested		3	21.42
	Not Interested		11	78.57

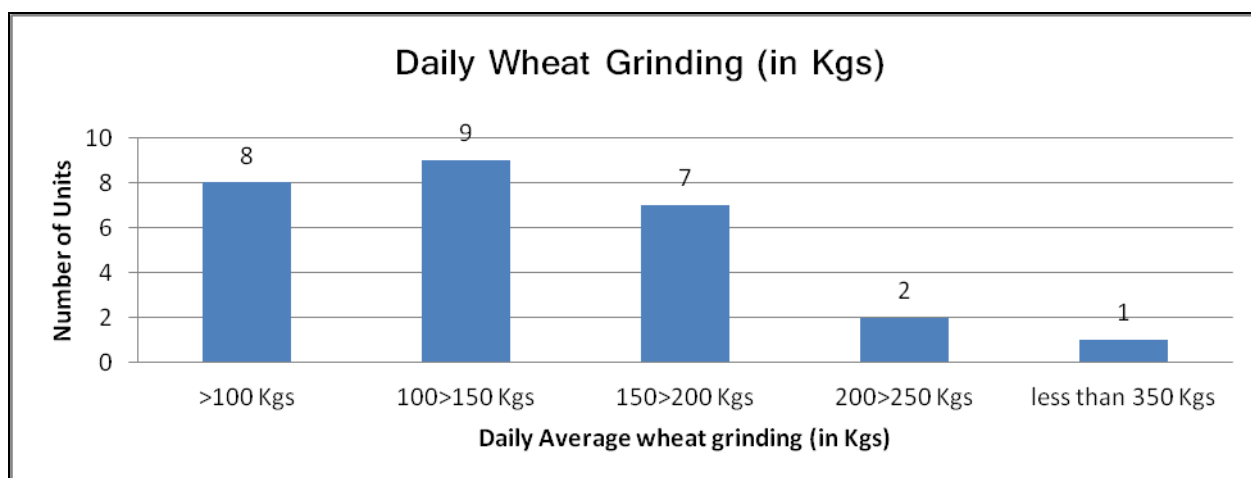
2.1.10 The study reveals that 14 chakki owner out of 27 doing flour fortification at chakki. 14 chakkis owner mention that they are satisfied towards flour fortification project. As it enriches all the group of community (i.e children, pregnant female, lactating female and old age person) by providing micronutrients to their daily meal. Rest respondent mention that due to decrease in their customer they stop adding premix to flour as consumer's complaint regarding black spot on chappati.

2.1.11 All 14 respondents mentioned that they follow the standard operating procedure (SOP) shared with them during training for doing flour fortification.

2.1.12 Among 14 respondents three shows interest to continue for flour fortification after the project ends.

2.1.13 The study reveals that 423 customer comes at chakki out this only 79 customer came for only flour fortification which is too less. Respondent adds that due to black spot on roti some people do not want to add premix in their flour or even they do not want to pay attention about fortified flour.

Figure 4 Daily Wheat Grinding (in Kg)



2.1.14 Above Bar charts show that in nine chakki grinding less than 150 kg a day, which followed by eight and seven chakkis who consumes less than 100 kg and less than 200 kg daily respectively.

- 2.1.15 After probing the study it's found that these chakki grinding 4070 kg of wheat flour daily which includes only 540 kg of fortified flour.
- 2.1.16 63 percent (approximately) of wheat flour fortification is done in those chakki, which grinding less than 200 kg daily.
- 2.1.17 Two main challenges are mentioned by the majority of respondent chakkis owners.
- 1) Lack of awareness among the tribal population due to illiteracy is the major challenges for the project.
 - 2) Respondent chakkis owner make noticed that due to black spot on chappati the project lacks behinds.

2. 2 Other findings:

- A large percentage (100 percent) of the respondent chakkis owner has lack of awareness regarding the maize flour fortification also start by NGO.
- Almost all the aware respondent chakkis owner told their customer regarding the use of flour fortification and its benefits in life.
- Almost 80 percent chakkis owner wants some benefit (i.e intensive) for doing this social work.
- The future of the flour fortification is uncertain without the help of the NGO said by almost all the respondent chakkis owners.
- Almost all chakkis owner states that people will not willing to pay the additional cost for fortification.
- Interaction with miller describe that still a large number of population remains to be sensitized on that issue.
- All hundred percent respondents mentioned that community accessing the flood fortification not only for the specific group. i.e malnourished children, adolescents, pregnant and lactating mothers. The respondent said that community wants to provide the micro nutrient to all member of the family. Miller explains that community is not restricted to any particular group; they want all family members to accessing the benefit. Even the old age person found the food fortification is helpful for her/his digestion.
- Respondent highlighted that now number of household own small grinding machines is increasing..
- While discussing with a group of old age people among community mentioned they heard about flour fortified ,but as the small grinding machine increase in household they are not accessing to chakki. So they want a small premix pack for household purpose.
- Further discussion able to extract that many consumers ignore flour fortification as its result is not seen soon.

2.3 Case Studies.

Case Study 1: Baroda , Salumbar

Name: Govind Prajapat

Age: 49

Occupation: Farming

Educational Qualifications: 5th Std.

Household size: 8 (2 Male, 5 Women and 1 Child)

Household social stratification: BPL

FF Consuming time period: 6-7 months

“taro taja rhere hai har din”

(It gives a fresh start each day)

Govind Prajapat shares that their family members get awareness about the Flour fortification project by IEC material and promotion activity by the BCT. Earlier his family is not aware about the flour fortification project, but slowly his wife and granddaughter told the family about the food fortification benefits as they heard about it from neighbors and in school respectively. His wife encourages family to use Fortified wheat flour regularly. Later family members feel that Flour fortification adds the energy in their daily schedule. He said that less weakness is felt by them after consuming the fortified wheat while working in the field. Govind told that family members said that roti are easily digestible as compare to the normal aata. Even Fortified rotis are also liked by his granddaughter in the meal which is also good for growth he add that. He appreciates BCT also provides sticker for the student notebooks which is also a good awareness activity among the children to reach the family.

Case Study 2: Devgaon, Salumbar

Name: Lichma Devi

Age: 35

Occupation: Housewife

Educational Qualifications: 10th Std.

Household size: 4 (including one 4 year child).

Household stratification: BPL

FF Consuming time period: 10 months

“roti kali hai par poustik hai ”

As the fortified chappati has a problem of black spot, but after making it but still the Lichma devi explain that she feels that it's good for the balance diet. Although her neighbor and rest villagers have issues regarding the roti having a black spot later on but her family consumes roti right just after she makes it. Lichma said that if user eats the roti on time then there is no problem of black spot. She also encourages that her relative, neighbor and friends for adding the premix in wheat flour at their respective chakkis. Lichma said that from starting of the project locality is aware about the project and its benefits of flour fortification. She suggests that if the problem of the black spot is remove the project goes to its maximum as the food fortification provide the micronutrient to children, adolescent and pregnant female . She addresses that the maximum people are tribal and less educated that why they are not opting the food fortification project properly.

Case Study 3: Gharood , Salumbar

Name: Manish Trevedi

Age: 25

Occupation: Shopkeeper

Educational Qualifications: 10th Std.

Household size: 7 (2 Children, 3 Female, 2 Male)

Household stratification: APL

FF Consuming time period: 12 months

Manish family using the food fortification since it launches in his villages. He has addressed that his family is aware about the benefit of the fortified flour. They know the importance of the micronutrient in the meal for the children and for the pregnant female which fortified food easily provides. Females in the family said that roti is making tasty and soft as compare to the normal flour which contains fewer nutrients. All is the game of consuming it on right time as later it generates the black spot like after cutting apple it get the red color. Fortified flour has the highest value of iron in it which leads the black spot on the roti.

Food fortification is the cheapest way to provide the nutrition to the village and poor people on a regular basis. Manish said in the city flour with micronutrient is much costly as here it is easily provided by the organization for use. He said it hard to tell the tribal about the food fortification benefit because many of them want the result soon which is not possible. Advertisement and campaign have to like that which also gives the knowledge and reduce their myth of tribal and village people regarding the black spot on roti.

CHAPTER-THREE

RECOMMENDATION

This study, done in the villages of the Salumber block shows that awareness of the Food fortification among the miller and the community is there, but when it comes to availing the Food fortification services regularly the community far lags behind.

1. In the current scenario food fortification needs awareness campaigns that promote the benefits and knowledge regarding flour fortification. Campaigns have to have a strong nutrition education component benefits of flour fortification and also about the process of fortification which also help full for those households who have a milling machine.
2. Awareness camps also have nutrition education about the supplementary feeding of the foods and micronutrients which make a complete diet which make the flour fortification successful.
3. Premix should also available for the household who own household milling machine.
4. An incentive scheme could be developed for chakki owner to motivate.
5. The iron percentage in the premix is to be kept low for keeping the black spot minimum in the chappati.
6. Premix is to be available in other food items also so maximum food item provides the nutrient to the population in the less time period.

ANNEXURE

1. Interview Schedule for Millers

S.NO	Particulars	Response
1	Name of Village	
2	Name of the Miller/Respondent	
3	Chakki Deal with	☐ Wheat ☐ Maize
4	Average Daily Consumption (at chakki) in Quintal/Kg	Normal Flour Fortified Flour
5	Number of Regular Customer (at chakki)	Normal Flour Fortified Flour
6	Are you aware of the Fortified Wheat Flour carried out by the organization?	☐ Yes ☐ No
7	Major User of Fortified Wheat Flour (in community)	☐ Women ☐ Old Age ☐ Child ☐ Men ☐ All
8	Number of Work Shop/ Training Attend by Chakki owner (Miller Owner)	
9	Work Shop/Training helpful Chakki owner (Miller Owner)	☐ Yes ☐ No
10	Community Aware about Fortified Wheat Flour Benefit?	☐ Yes ☐ No
11	Reason of using Fortified Wheat Flour (Community)	
12	Are you Satisfied with the benefits by Fortified Wheat Flour? (If NO, skip to Question 14)	☐ Yes ☐ No
13	If Yes, What changes it give to health?	
14	What is your Opinion about the Fortified Wheat Flour project in your village?	
15	Instrument Available in the Shop	☐ Tin Box with Sticker. ☐ Tin Box without Sticker. ☐ Display Board. ☐ Instruction Flex.

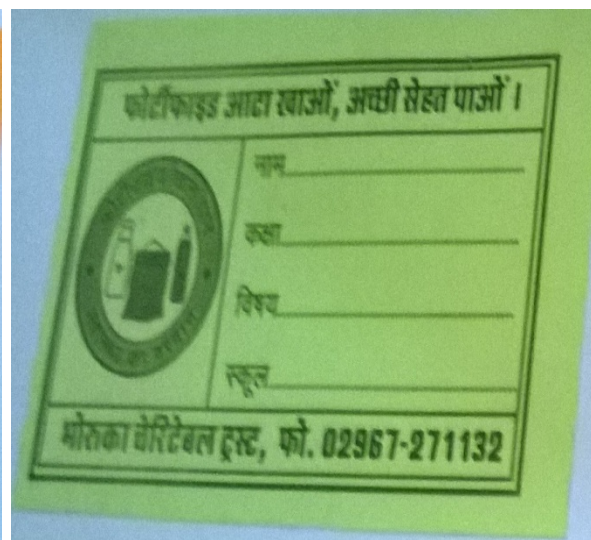
2. Display Board



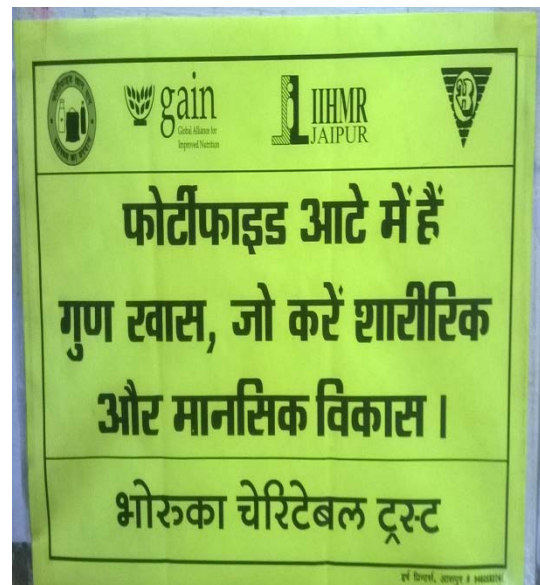
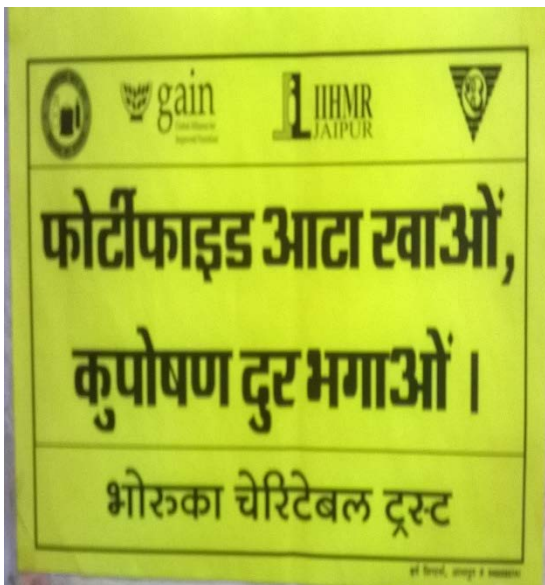
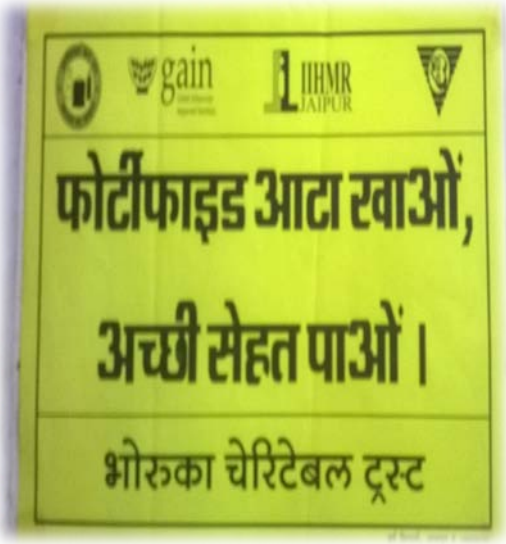
3. Premix packs



4. Note Book Stickers



5. Wall poster



6. Tin Box with premix



7. Wall painting.



8. Instruction Flex

IHMR JAIPUR **gain** Global Alliance for Improved Nutrition

ग्राम स्तरीय आटा फोर्टीफिकेशन परियोजना

मिश्रण से सम्बन्धित मार्गदर्शन :-

गेहूँ की मात्रा (कि.ग्रा)	प्री मिक्स की मात्रा (चम्मचों की संख्या के अनुसार)	
	बड़ी चम्मच	छोटी चम्मच
5	1	
6	1	1
7	1	2
8	1	3
9	1	4
10	2	

उदाहरण स्वरूप अगर आपके पास कोई ग्रामीण 8 कि.ग्रा. गेहूँ पिसाने लाता है तो आप उसके गेहूँ में एक बड़ी चम्मच और 3 छोटी चम्मच प्री मिक्स पाउडर मिलाएँ।
 ध्यान दें: चम्मचों में पाउडर का स्तर ज्यादा भरा न रहे अर्थात् चम्मच में पाउडर का स्तर समतल रहे।

शुद्ध मिश्रण, आरोग्य & समृद्धि

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