



# ADDRESSING HEALTH THROUGH NUTRITION IN THE THAR DESERT

**Gravis**



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## **NOTE FROM GRAVIS**

GRAVIS as an organization working directly with the Thar Desert communities has always taken a holistic approach for the health and development aspects. In our view, nutrition and sanitation are key aspects to improve the health status of rural communities of Thar. Keeping this in view, Project IHNS has been planned with the support of TAMY and the Government of Finland.

This study focuses on nutrition and is an attempt to compile the nutrition-related challenges in India, the work done by GRAVIS and what would be key focus areas for future. Hopefully, the study will be a useful tool for us and for other stakeholders to address nutrition in a holistic and effective way in future.

I sincerely thank Mangala Dubey for her dedicated work on leading the study, the GRAVIS team for their sincere cooperation and most importantly the local communities for their patient and active support. GRAVIS is grateful to TAMY and the Government of Finland for their financial and technical support towards the study. We hope the study is widely disseminated and utilized.

**Prakash Tyagi**

Executive Director, GRAVIS





## **NOTE FROM THE AUTHOR**

The author is grateful to GRAVIS for the opportunity given to understand and appreciate different aspects of rural development and the nutritional challenges prevalent in the village community of Thar.

The author appreciates all those who provided her the assistance in completing this study. GRAVIS staff was particularly considerate and helpful and extended all possible support. The author is grateful for their voluntary help.

It is expected that the outcome of this study could be used as reference in Jodhpur, Rajasthan and beyond. It is also hoped that these results would generate interest that would cascade into a great success in the provision of training programmes in the areas of health and nutrition, water and sanitation, building of horticulture units for those in need and, in the process, would result in the reduction of water-borne diseases, infections and address the nutritional deficiencies of the community.

**Mangala Dubey**







## EXECUTIVE SUMMARY

Malnutrition is the principal cause of child deaths and mental deficiencies in developing countries. This worrisome state has been specified in Sustainable Development Goals (SDG) of 2015. United Nations General Assembly has declared 2016-2025 as the 'decade of action on malnutrition.'<sup>1</sup> Various UN agencies and international organizations have voiced their concern over malnutrition and have delineated their respective action plans. A holistic approach is required for resolution of malnutrition and associated problems in all affected countries, including India.

Malnutrition has taken a heavy toll in a large number of states in India. Recent reports by Indian Health and Nutrition and National Family Health Survey -4 (NFHS-4) have dwelt at length on this malaise. Inter alia, the situation in almost all the states of India has been discussed, including Rajasthan, where the condition is discouraging.

Government of India, Rajasthan Government and various non-governmental organizations, like GRAVIS, are making sincere and serious efforts to usher positive, pragmatic and meaningful changes for betterment. The present study, conducted by GRAVIS, highlights efforts being made by GRAVIS and other organizations to alleviate poverty and improve child and woman health through nutrition interventions.

GRAVIS is propelled by tenets of Gandhian philosophy and is therefore making concerted efforts to help the poor in areas of health, education, nutrition, and livelihood. Their various programmes in the areas of water, food security, education, health, and community development are making a tangible contribution to the society.

The present study evaluates the outcome of health and nutrition Project undertaken by GRAVIS in the Thar region of Rajasthan. Significant steps have been taken by GRAVIS to improve woman and child health, as also sanitation and horticulture. The study is an objective assessment of various accomplishments and the suggested way forward in the nutritional and health initiatives.

The study, through extensive interactions with men, women and children in the target villages during site visits has arrived at some observations and has made appropriate recommendations. It was found that GRAVIS, in conjunction with rural communities, has made considerable progress in attaining their stipulated objectives. GRAVIS has been commended for significant positive development in child health through efficient implementation of nutrition and health schemes. The areas of shortfalls have also been indicated for appropriate remedial action. The study provides a succinct and clear assessment of the Project in three chapters, underscoring the need for the Project's continuance for lasting and enduring gains.

Chapter 1 provides an overview of malnutrition prevalent globally with special focus on India.

Chapter 2 focuses on malnutrition in Rajasthan. It briefly talks about the Project, the given study and its interventions.

Chapter 3 has findings and recommendations.



# CHAPTER 1

## INTRODUCTION

### Malnutrition-The Global Scenario

Globally, malnutrition continues to be one of the leading causes of child deaths, impaired physical and cognitive development, and increased susceptibility to illness. Chronic malnutrition beyond the age of 2-3 years is hard to reverse and has long-term impacts on literacy and economic productivity.

The root causes of malnutrition and the factors leading to it are complex and multidimensional. Poverty, underdevelopment, and low socioeconomic status are three major contributors, along with other social determinants. These include constraints of access to land, water, and other resources—often aggravated by environmental damage—along with unsustainable production and consumption patterns, food losses and waste, and unequal distribution and access. Malnutrition is often aggravated by poor feeding and care practices for infants and young children, as well as poor sanitation and hygiene. Lack of access to education, quality health systems, and safe drinking water also has a negative effect, along with infectious diseases and the ingestion of harmful contaminants.

The annual Gross Domestic Product (GDP) losses from low weight, poor child growth, and micronutrient deficiencies average 11 percent in Asia and Africa—greater than the loss experienced during the 2008–2010 financial crisis. The number of stunted children under five remains high in Asia, Africa and Oceania; behind these rather gloomy numbers is a cause for hope: even modest changes could put many countries on course to meet global targets<sup>1</sup>.



*Areas like Thar have serious nutrition challenges*



In 2015, the Sustainable Development Goals (SDGs) encompassed 'ending all forms of malnutrition' and earlier this year, the United Nations General Assembly declared 2016-2025 as the 'decade of action on malnutrition,' which set forth a global movement to end malnutrition in all its manifestations by 2030<sup>1</sup>. Over the past decade, momentum around nutrition has been steadily building: In 2012 the World Health Assembly adopted the 2025 Global Targets for Maternal, Infant and Young Child Nutrition. The following year, it went on to adopt targets for non-communicable diseases (NCDs), including those relevant to nutrition. Also in 2013, at the first Nutrition for Growth (N4G) Summit, donors committed US\$23 billion to improve nutrition. With the Second International Conference on Nutrition (ICN2) in 2014 and with the recent naming of 2016–2025 as the United Nations Decade of Action on Nutrition, more and more people have begun to recognize the importance of addressing malnutrition in all its forms. In 2015, the UN Sustainable Development Goals enshrined the objective of 'ending all forms of malnutrition', challenging the world to think and act differently on malnutrition—to focus on all its facets and work to end it, for all people, by 2030. The year 2016, brought major opportunities to translate this commitment into action. These opportunities included countries' adoption of their own targets related to the Sustainable Development Goals, the ongoing Nutrition for Growth process, and Japan's growing leadership on nutrition in the lead-up to the 2020 Tokyo Olympics and Paralympics<sup>1</sup>.

Statistics given below indicate the global indices of malnutrition in 2015. These indices remain a cause for concern for the governments of affected regions and need to be addressed through concerted action.

### Global Indices of Malnutrition

Indicator	Number of individuals	Current prevalence (%)
Under-5 stunting	159 million in 2014 (255 million in 1990)	238 (39.6 in 1990)
Under-5 overweight	41 million in 2014 (31 million in 1990)	6.1 (4.3 in 1990)
Under-5 wasting	50 million in 2014	7.5
Under-5 severe wasting	16 million in 2014	2.4
Anemia in women ages 15-49 years	533 million in 2011	29 for nonpregnant women in 2011 (33 in 1995) 38 for pregnant women in 2011 (43 in 1995)
Exclusive breast feeding (under 6 months)	NA	39 in 2014
Low birth weight	20 million in 2014	15
Adult overweight (ages 18+)	1.9 billion in 2014	39
Adult obesity (ages 18+)	600 million in 2014	13
Adult diabetes (raised blood glucose) (ages 18+)	NA	9

**Source :** Stunting, overweight, wasting and severe wasting figures are from the 2015 Joint Child Malnutrition Estimates, which estimated figures for 2014 (UNICEF, WHO,) and World Bank 2015); anemia figures are from Stevens et al. (2013), who estimated data from 2011 ; exclusive breastfeeding data are from UNICEF 2016b); low birth weight data are from the latest World Health Organization (WHO) policy brief on the subject (WHO 2014A); adult overweight, obesity, and diabetes data are from WHO (2014b).

**Note :** NA = not available, there are no global numbers on how many people have diabetes and how many infants are exclusively breastfed, to correspond with the percentages. Comparable data are not available for 1990 for under-5 wasting, under-5 severe wasting and anemia in women of reproductive age. According to the Joint Child Malnutrition Estimates for 2015 (UNICEF, WHO, AND WORLD BANK 2015), there were 667 million children under 5 in the world.

Source: Global Nutrition Report 2016



## Global Progress against Global Nutrition Targets

Target and indicator	Baseline year	Baseline status	Target for 2025	On or off course?	Basis for assessment
<i>Stunting</i> 40% reduction in the number of children under 5 who are stunted	2012	162 million	~100 million (currently 159 million)	Off	Current rate of reduction not rapid enough to attain 100 million by 2025
<i>Wasting</i> Reduce and maintain childhood wasting at less than 5%	2012	8%	< 5% (currently 7.5%)	Off	Current rate of reduction not rapid enough to reach below 5% by 2025
<i>Under-5 overweight</i> No increase in childhood overweight	2012	7%	No increase (currently 6.1%)	Off	The baseline proportion for 2012 was revised down from 7% to 5.9% in the JCMEs for 2015, and the current rate is marginally above this threshold and hence off course
<i>Anemia</i> 50% reduction of anemia in women of reproductive age	2011	29%	15% (no new data over baseline)	Off	Very little progress since 1995, when it was estimated at 33%
<i>Low birth weight</i> 30% reduction in low birth weight	2018-2012	15%	10%	NA	Estimating methods being revised (see Panel 2.1)
<i>Exclusive breastfeeding</i> Increase the rate of exclusive breastfeeding in the first six months to at least 50%	2018-2012	38%	50% (currently 39%)	Off	Not increasing rapidly enough to meet 50% by 2025
<i>Adult overweight</i> Halt the rise in prevalence	2014	38%	Halt the rise in prevalence	Off	Rates are increasing in vast majority of countries, 2010–2014
<i>Adult obesity</i> Halt the rise in prevalence	2014	12%	Halt the rise in prevalence	Off	Rates are increasing in vast majority of countries, 2010–2014
<i>Adult diabetes (raised blood glucose)</i> Halt the rise in prevalence	2014	9%	Halt the rise in prevalence	Off	Rates are increasing in vast majority of countries, 2010–2014

**Source:** Based on IFPRI (2014, Table 3.1; 2015a, Table 2.1), UNICEF, WHO, and World Bank (2015), WHO (2014b, 2016s, 2016t); 1995 anemia estimate from Stevens et al. (2013).

**Note:** The term “global nutrition targets” refers to targets adopted by the World Health Assembly for maternal, infant, and young child nutrition and the nutrition-related targets in the Global Monitoring Framework for the Prevention and Control of NCDs. For low birth weight, new data estimation methods have been developed and are planned for release in the second half of 2016 by a working group including the London School of Hygiene and Tropical Medicine, UNICEF, and the World Health Organization. For more on the methods behind the stunting target, see de Onis et al. (2013). NA = no data available. JCMEs = Joint Child Malnutrition Estimates.

**Source: Global Nutrition Report 2016**



**Figure 1 - Countries that are Closest to Moving from Off-Course to On-Course by Nutrition Indicator**

<b>Stunting, children under 5 (n=114)</b>	Nepal (closest), Cote d'Ivoire, Nicaragua, Uruguay Serbia, Zimbabwe, India, Equatorial Guinea, Rwanda, Sri Lanka
<b>Wasting, children under 5 (n = 130)</b>	Suriname (closest), Tonga, Haiti, Liberia, Viet Nam, Cameroon Senegal, Congo, Bhutan, Guinea-Bissau
<b>Overweight, children under 5 (n=109)</b>	Jamaica (closest), Djibouti, Bolivia, Morocco, Lesotho, Indonesia Chile, Mozambique, Rwanda, Republic of Korea
<b>Exclusive breastfeeding, &lt;6 months (n=83)</b>	Peru (closest), Malawi, Jamaica, Guatemala, Bhutan, Ukraine Ethiopia, Armenia, The FYR Macedonia, Belarus
<b>Anemia, women aged 15-49 years (n=185)</b>	Peru (closest), Vanuatu, Mexico, Kenya, Philippines, Ethiopia, Tajikistan, Indonesia, Panama, Malawi
<b>Adult overweight/obesity (BMI&gt;25) (n=190)</b>	Nauru (closest), Marshall Islands, Tonga, Kiribati, Micronesia, Palau, Fiji, Japan, Samoa, DPR Korea
<b>Adult obesity (BMI≥30) (n=190)</b>	DPR Korea (closest), Nauru, Japan, Afghanistan, Timor-Leste, Eritrea, Nepal, Niger, Burundi, Central African Republic
<b>Adult diabetes (raised blood glucose) (n=190)</b>	Israel (closest), Bosnia and Herzegovina, Latvia, Singapore, DPR Korea, Belgium, Spain, Ukraine, Montenegro, Japan

**Source :** Authors, based on data from Stevens et al. (2013), UNICEF (2016b), UNICEF, WHO, and World Bank (2015), and WHO (2015a).

**Note :** BMI = body mass index; DPR Korea=Democratic People's Republic of Korea; The FYR Macedonia=The former Yugoslav Republic of Macedonia.

**Source : Global Nutrition Report 2016**

Figure 1 highlights the ten countries for each indicator that are closest to meeting the required rate of change to reach the global goal in 2025.

In recent years, a greater understanding has developed regarding the importance of nutrition at different stages of the life course and the effect of poor nutrition across generations. The past two decades have also seen a major shift in understanding of the policy responses required to improve nutrition and promote healthy diets. Similarly, there is now much greater awareness that effective responses need to come from beyond the health sector and that this must involve other sectors, such as those related to water and sanitation, education, trade, and social protection. Though India is one of the countries closest to moving away from off course, a closer look at the Indian scenario vis a vis malnutrition brings out some significant causes for concern.

### The Indian Scenario

Malnutrition remains the leading cause of child mortality in India. The causes of malnutrition are diverse, and an effective response to counter them requires coordinated efforts from multiple sectors. Despite numerous programmes of Government of India, state governments, UN and many NGOs, rates of malnutrition in India remain worryingly high. For decades, under-nutrition in India was mainly



related to hunger and food insufficiency. However, over time, new underlying causes of under-nutrition have evolved and are now mainly identified as:

- a) Inappropriate children feeding and caring practices especially in the early years of life
- b) Low social and nutrition status of women
- c) Poor health and sanitation services
- d) Poor livelihood opportunities leading to limited purchasing power for food.

According to National Family Health Survey -III (NFHS-III) 2005-06, conducted by Ministry of Health and Family Welfare, India had 48% stunted, 19.8% wasted, and 42.5% underweight children **below 5 years** (45%, 23% and 40% respectively for children **below 3 years**)<sup>2</sup>.

In a stark and chilling reminder of the realities of life in India, the recently released NFHS-IV (2015-16) results show that over 58% of children below five years of age are anemic, leaving them exhausted, vulnerable to infections and possibly affecting their brain development. The survey, which was carried out in 2015-16 and covered six lakh households, also showed that around 38% of children in the same age group were stunted, 21% were wasted and 36% underweight. While all the internationally accepted markers of children's health have improved since the last survey in 2005-06, the levels of undernourishment, caused mainly by poverty, are still high and improvement too slow<sup>9</sup>. The survey also found that just over half of all pregnant women were anemic. This would automatically translate into their newborn being weak. Overall, 53% of women and 23% of men in the 15-49 age groups were anemic. These are clear signs of an endemic crisis of hunger in the country that policy makers don't appear to be addressing.

<b>Children Under 5 Years</b>	<b>2005-06</b>	<b>2014-16</b>
Stunted	48	38.4
Wasted	19.8	21
Severely wasted	6.4	7.5
Underweight	42.5	35.7
Anemic	69.4	58.4

Children with low weight relative to their height are considered wasted; those with low height relative to age are stunted and those with low weight relative to age are underweight (Figures in %)

The 2015 Global Hunger Index (GHI) Report ranked India 20th amongst leading countries with a serious hunger situation. Amongst South Asian nations, it ranks third behind only Afghanistan and Pakistan.

Though child under nutrition rates have been declining, first at a slow rate between 1992 to 2006 and at an accelerated pace since 2006 but these rates are below the rate needed to meet the World Health Assembly's global nutrition targets that India is signatory to. Between 2006 and 2014, stunting rates for children under five declined from 48 to 39 percent. This, in turn, reflects a 23 percent reduction in the number of stunted children and a 35 percent reduction in the number of underweight children. However, despite strong economic growth and a significant decline in malnutrition over the past decade, 16% of the





Indian population is still malnourished. Globally, 35% of the world's low birth weight infants and 43% of the world's malnourished live in India. Child malnutrition rates in India are still among the highest in the world, with nearly one-half of all children under three of age being either under weight or stunted. India is home to over 40 million stunted children and 17 million wasted children under five<sup>3</sup>.

The change in nutritional status across Indian states has been variable. In general, states with the lowest levels of stunting in 2006 achieved the highest proportional increase in the eight years that followed. Some states, including Arunachal Pradesh, Mizoram, and Delhi, had relatively large rates of reduction in stunting, but overall levels of under nutrition remained high because of high baseline rates. Meanwhile in Uttar Pradesh, Bihar, Jammu and Kashmir, Manipur and Jharkhand, the situation has not undergone significant change<sup>3</sup>.

The Census of India conducted clinical, anthropometric and bio-chemical (CAB) survey in 2014 as part of the Annual Health Survey. According to the Census, Chhattisgarh has succeeded in lowering the percentage of stunted (less height for age) among under-five children from 53 per cent to 35 per cent. The percentage of underweight (less weight for age) children has also reduced to 39 per cent from 53 per cent. Bihar has reduced the percentage of stunted children from 58 per cent to 52 per cent. The percentage of underweight children has gone down to 40 per cent. However, Madhya Pradesh still has high percentage (51 per cent) of stunted children. The percentage of underweight children is 40 per cent. But malnourishment among boys is very high in the state. The stunting is as high as over 58 per cent and underweight is 49 per cent.

The data shows that Jharkhand also has high percentage of malnourished children. The stunting is over 50 per cent and underweight 45 per cent. Rajasthan has 44 per cent stunted and 36.6 per cent underweight children. Odisha has 41.5 per cent and 39 per cent of underweight children. Uttar Pradesh failed to reduce malnourishment among children. The state has 62 per cent of stunted and 45 per cent of underweight children in its child population. In the state, malnutrition among boys is slightly higher than what is among girls. The survey covered 284 districts<sup>3</sup>.

Based on the 2011 Census data, the total number of children under five in India in 2015 is projected at 12.4 crore. So, around 7.2 crore children are anemic, nearly 5 crore are stunted, around 2.6 crore are wasted and 4.4 crore are underweight. These numbers are not too different from those in 2005-06. Since population has increased, their share is down.

Ironically, the continuing problem of under nutrition in India now coexists with the problem of overweight and obesity and associated non-communicable diseases for a different, mainly urban, segment of the population. Despite India's economic dominance in the subcontinent in terms of per capita income, nutritional indicators remain poor as also the indicators for access to improved sanitation and immunization, which are the lowest in the region.

The World Health Organization (WHO) says high levels of these markers are clear indications of 'poor socio-economic conditions' and suboptimal health and / or nutritional conditions'. In short, lack of food, unhealthy living conditions and poor health delivery systems.



## **Causes of malnutrition in India**

### **1. Malnutrition in Women**

Poor health condition of women and girls is a depressing reality across the whole of India. Malnutrition in women in India is directly linked to their low social status vis a vis men. This leads to them being treated as inferior human beings who do not receive the minimum amount of nutrition compared to males. And this happens at all stages of life. The result is abject malnutrition with evidence of low birth weight, birth defects, low weight and anemia during pregnancy leading to low birth weight, birth defects and hemorrhage of the new born. More than half of Indian women are anemic. Early marriage of females makes matters worse because weak and anemic women bear children at an early age and the newly born themselves are in a very poor state of health, and the cycle goes on.

### **2. Poverty**

Poverty plays a direct role in malnutrition. Due to low purchasing power, poor cannot afford to buy desired amount and quality of food for the family. This adversely affects their capacity for physical work and they earn less. Thus starts a vicious cycle of poverty, under nutrition, diminished work capacity, low earning and poverty.

### **3. Feeding habits**

Lack of awareness of nutritional qualities of food, irrational beliefs about food, inappropriate child rearing and feeding habits all lead to under nutrition in the family. A significant contributor towards poor feeding habits is lack of education in women who are responsible for rearing the children and feeding the family.

### **4. Micronutrient Deficiencies**

Micronutrients are required in small quantities and responsible for vital functions of the human body. Micronutrient deficiencies, including deficiencies of vitamin A, iron, iodine, zinc and folic acid, are common among women and children in low- and middle-income families in India. The intake of micronutrients in daily diet is far from satisfactory and largely less than 50% Recommended Dietary Allowance (RDA) is consumed by over 70% of Indian population. The loss due to micronutrient deficiency costs India 1 percent of its GDP. This amounts to a loss of Rs. 27,720 crore per annum in terms of productivity, illness, increased health care costs and death<sup>4</sup>. Every day, more than 6,000 children below the age of five die in India. More than half of these deaths are caused by malnutrition-mainly the lack of Vitamin A, iron, iodine, zinc and folic acid. About 57% of preschoolers and their mothers have subclinical Vitamin A deficiency<sup>5</sup>. Anemia prevalence among children under five years is 69% and among women it is over 55% in a recently concluded national study<sup>6</sup>. With the scientific reality of anemia being a late result of iron deficiency, these data reflect an almost universal iron deficiency in Indian population.

### **5. Breastfeeding practices**

World Health Organization (WHO) has identified poor infant feeding as a risk factor for the survival of the child, contributing to neonatal deaths. Linked to this is the poor health of young mothers due to



malnutrition who as a result are unable to breast feed the newly borns. Lack of improvement in infant and young child feeding practices is conspicuous.

#### **6. Poor sanitation**

About 50 percent of Indians defecate in open fields as households do not have toilets. Children thus pick up parasites and chronic infections that impair the ability of the intestines to absorb nutrition. United Nations International Children's Emergency Fund (UNICEF) reports death of almost 1,17, 000 Indian children per year from diarrhea alone. Open defecation perpetuates a vicious cycle of disease and poverty. There are three identified direct pathways through which poor sanitation and associated open defecation may adversely affect nutritional outcomes in children: diarrheal diseases, mal-absorption of nutrients and worm infections.

Low status of women in the society, illiteracy, lack of clean drinking water, open defecation, lack of health education, micronutrient deficiency, lack of infrastructure and availability of health professionals are the main reasons for malnutrition in India. This has a huge impact on health, economy and social aspects of society. Nutrition indicators in India have not kept pace with the galloping Indian economy, which now dominates the Asian region. Hence malnutrition remains a serious cause for concern for both state and central governments.



## CHAPTER 2

# PROBLEMS OF NUTRITION IN THE THAR REGION

### Background

Rajasthan is India's largest state by area (342,239 square kilometers or 10.4% of India's total area). Total population of Rajasthan, as per 2011 Census, is 68,548,437 of which male and female are 35,550,997 and 32,997,440 respectively. In 2001, total population was 56,507,188 when males were 29,420,011 and females were 27,087,177. The total population growth in this decade was 21.31 percent while in previous decade it was 28.33 percent. The population of Rajasthan was 5.66 percent of India in 2011<sup>10</sup>.

The main geographic feature of Rajasthan is the Aravali Range, which splits the state into two geographical zones – desert on one side and forest belt on the other. Climate in Rajasthan is generally dry. The soil and vegetation alter with the varying topography of the state and the availability of water. The main crops are wheat, barley, pulses, gram and oilseeds. Rajasthan is the second largest producer of oilseeds and edible oil in the country. Apart from agriculture, Rajasthan is the second largest producer of polyester and cement in India, besides being the largest producer of wool, marble and sandstone. Improved infrastructure and transportation facilities, even in the remotest areas of the state, contribute to development of industries<sup>10</sup>.

### The Thar Desert

Within India the Great Indian Desert of Thar, as it is commonly called, forms a part of the country's north west arid zone ( 69%) in Rajasthan, 21% in Gujarat ,Punjab and Haryana (10%) each respectively. The desert is bordered by the irrigated plains of River Indus in the west, the Aravalli hill ranges in the east, the Rann of Kutch in the south and the plains of Punjab and Haryana in the north and northeast. The greater part of desert has remained arid to hyper arid conditions. The annual precipitation is low, ranging from less than 100 mm in the west to about 500 mm in the east. It is highly erratic and about 90 % of the rainfall is received during July and August. Delayed onset and early withdrawal of monsoon is quite common. Summer temperature remains high, reaching up to 50°C in May and June in some places. Dust storms are quite common with wind velocity above 50 km/h<sup>7</sup>.

The Thar Desert, also known as the Great Indian Desert, is the world's 17<sup>th</sup> largest desert area-wise. It is the most densely populated desert in the world, with a population density of 83 people per km<sup>2</sup>. About 40% of the total population of Rajasthan lives in the Thar Desert. The main occupation of the people is agriculture and animal husbandry. The region is a haven for 141 species of migratory and resident birds of the desert housing eagles, harriers, falcons, buzzards, kestrel and vultures. There are also a number of reptiles. In the last 15–20 years, the Thar Desert has seen many changes, including manifold increase in both human and animal population. Animal husbandry has become popular due to the difficult farming conditions. At present, there are ten times more animals per person in Rajasthan than the national average. Overgrazing affects climate and causes drought and has resulted in serious land degradation.



## Malnutrition in Thar Region

Malnutrition is a cause of major concern in rural areas of Thar region. The region is extremely drought prone causing great losses to livelihood. According to National Family Health Survey -3 (NFHS-3) 2006 statistics some of the contributing factors for under nutrition were:

- ▶ 79.1% of children aged 6 -35 months were found to be anemic, 61.7% of pregnant women aged 15 -49 years were also found to be anemic
- ▶ Only 30.8% of households had access to a toilet facility, with a mere 8.4% in rural areas
- ▶ 19.6 was the median age at which women gave birth to their first child
- ▶ Mothers who had no education were more likely to have children who were nutritionally unstable: 27.3% stunted and 7.7% wasted compared to 19.5% and 3.9% for children whose mothers had completed >5 years of education<sup>8</sup>.

Scheduled Castes in Thar Desert and tribal communities in the state are the most vulnerable for under nutrition. Within these groups, women and young children, especially girls, are most affected. The malnourished premature and Low Birth Weight (LBW) infants are particularly exposed to risk of impaired growth or even death.

As per the Rapid Survey of Children 2013-2014, Rajasthan ranks 10th-worst among 29 Indian states for stunting and 15th for wasting, with 36.4% of children under five classified as stunted and 14.1% classified as wasted. These children are more likely to suffer cognitive and physical disabilities. The condition also weakens the immune system and puts children at greater risk of infectious diseases.

Frequent droughts bring crop failure and create inadequate sanitation in the already difficult lives of villagers. Lack of healthcare, health education leading to disease and premature mortality make living in the Thar extremely demanding. Also, poor hygiene and sanitation practices in rural areas are causes of much concern owing to their detrimental effects on residents' health.

Feudal society, poor socio-economic status of women and prevalence of social evils have been predominant features of the rural communities in Rajasthan, particularly Thar, for a long time. Since mere survival in the tough Thar desert is the priority for majority of Thar populace, not surprisingly, health care does not draw serious attention. The inhabitants cannot afford to spend much time and money on health, when the priority is water, food and fodder. Lack of education and awareness among the rural population worsens the situation. Health care services in rural areas are almost non-existent.

Some of the health indicators highlighted in the National Family Health Survey – 4 (NFHS-4) 2015-16 report for Rajasthan and specifically Jodhpur district vis-a vis India are given below. Fact sheet for Rajasthan provides information on key indicators and trends for Rajasthan. The figures of NFHS-4 and that of earlier rounds may not be strictly comparable due to differences in sample size and NFHS-4 will be a benchmark for future surveys. The fact sheet for Jodhpur district shows information for urban and rural areas and the district as a whole because the present urban population in Jodhpur is between 30-70%, which provides a sufficiently large sample to produce reliable estimates of most indicators for both urban and rural areas.



## Key Health Indicators for Rajasthan

Indicators	NFHS-4 (2015-16)		NFHS-3 (2005-06)	
	Urban	Rural	Total	Total
<b>Child Immunization and Vitamin A Supplementation</b>				
Children age 12-23 months fully immunized (BCG, measles, and 3 doses each of polio and DPT) (%)	60.9	53.1	54.8	26.5
Children age 9-59 months who received a vitamin A dose in last 6 months (%)	47.3	37.5	39.6	8.6
Children age 12-23 months who received most of the vaccinations in public health facility (%)	88.8	96.0	94.4	87.2
Children age 12-23 months who received most of the vaccinations in private health facility (%)	11.1	2.4	4.4	4.1
<b>Child Feeding Practices and Nutritional Status of Children</b>				
Children under age 3 years breastfed within one hour of birth	26.6	28.9	28.4	13.3
Children under age 6 months exclusively breastfed (%)	61.3	57.5	58.2	33.2
Children age 6-8 months receiving solid or semi-solid food and breast milk (%)	34.7	28.9	30.1	38.7
Children under 5 years who are stunted (height-for-age) (%)	33.0	40.8	39.1	43.7
Children under 5 years who are wasted (weight-for-height) (%)	21.6	23.4	23.0	20.4
Children under 5 years who are severely wasted (weight-for-height) (%)	7.9	8.7	8.6	7.3
Children under 5 years who are underweight (weight-for-age) (%)	30.7	38.4	36.7	39.9
<b>Nutritional Status of Adults (age 15-49 years)</b>				
Women whose Body Mass Index (BMI) is below normal (BMI < 18.5 kg/m) (%)	18.6	29.9	27.0	36.7
Men whose Body Mass Index (BMI) is below normal (BMI < 18.5 kg/m) (%)	16.7	25.1	22.7	40.5
Women who are overweight or obese (BMI ≥ 25.0 kg/m) (%)	23.7	10.7	14.1	8.9
Men who are overweight or obese (BMI ≥ 25.0 kg/m) (%)	19.7	10.6	13.2	6.2
<b>Anemia among Children and Adults</b>				
Children age 6-59 months who are anemic	55.7	61.6	60.3	69.6
Pregnant women age 15-49 years who are anemic	41.4	48.0	46.6	61.7
All women age 15-49 years who are anemic (%)	40.7	49.0	46.8	53.1
Men age 15-49 years who are anemic (%)	15.2	18.0	17.2	23.6



### Key Health Indicators for Jodhpur District

Indicators	NFHS – 4 (2015-16)		
Nutritional Status of Adults (age 15-49 years)			
	Urban	Rural	Total
Women whose Body Mass Index (BMI) is below normal	16.0	23.5	20.8
Men whose Body Mass Index (BMI) is below normal	11.9	20.8	17.3
Women who are overweight or obese	26.1	13.9	18.3
Men who are overweight or obese	25.0	13.8	18.1
Anemia among Children and Adults			
Children age 6-59 months who are anemic (%)	57.8	66.1	63.6
Non-pregnant women age 15-49 years who are anemic (%)	41.4	46.2	44.5
Pregnant women age 15-49 years who are anemic (%)	31.34	43.8	40.8
All women age 15-49 years who are anemic (%)	41.1	46.1	44.3
Men age 15-49 years who are anemic (%)	19.5	12.8	15.4

While the curative facilities are extremely scarce in Thar region, the public health training facilities are even more rare, posing challenges to disease prevention and creating a severe shortage of public health professionals at the grass root levels. Different factors contributing to the low nutritional status in the region can be an object of numerous measures and activities in order to decrease their negative impact on the village community. The situation therefore demands attention at both government and non-governmental levels to eliminate the scourge of malnutrition from the Thar region.

#### ROLE OF GRAVIS

GRAVIS, an NGO based in the Thar Desert of Rajasthan, has been working to empower the rural communities for the last 32 years. It covers over 1,200 villages with its activities and interventions and benefits about 1.2 million people living in Thar.

Since its founding in 1983, GRAVIS's work has been rooted in two Gandhian philosophies: '*Sarvodaya*', or 'the collective rise of men, women, and children, regardless of economic situation, caste or religion', and '*Gram Swaraj*', village self-rule. These philosophies form a corner stone for all of GRAVIS's projects. The concept of Sarvodaya directs GRAVIS's efforts towards serving the most disadvantaged and marginalized of society first, while Gram Swaraj ensures that the communities, which GRAVIS serve, retain control over their own development. Not only does GRAVIS's commitment to local engagement and respect for



traditional knowledge ensure that the communities they serve maintain ownership and autonomy over the future of their village, it also encourages villages to be independent and self sustaining. After three decades of work, GRAVIS has expanded its impact from a single village, named *Gagadi*, to over 1,300. In addition to their headquarters in Jodhpur city, they have 16 centers throughout the Thar Desert and Uttarakhand.

Health has been a major area of GRAVIS' work and the focus has been on improving the health conditions of women living in Thar. Keeping this in view, GRAVIS had set up a comprehensive, rural hospital in village Tinwari in Osian Tehsil of Jodhpur district. This 70-bed hospital is fully equipped and is manned with a team of well qualified doctors and nurses. The facility caters to people living in about 50 villages in the surrounding area and is a major source of medical help for about 100,000 men and women. In the last 15 years, the hospital has provided very good services to women and other patients of the area.

From 2014 to 2016, GRAVIS trained 20 new VHWs, ran 45 medical camps, treated over 36,000 patients, ran 8 eye camps and screened 397 people for various illnesses. About 1,194 eye surgeries and 4,500 immunizations were undertaken. GRAVIS also runs and manages 12 crèche units providing supplementary nutrition and health checkups for the children of poor working mothers. The crèche units take care of 360 children under the age of five in 10 villages of Osian Development Block of Jodhpur district.

Despite concerted efforts of GRAVIS, meeting all the health and nutritional requirements of Thar region still remains a challenge. There is plenty of work ahead and constant need of support and strengthening of the Village Development Committees (VDCs) and Village Health Workers (VHWs) is needed.



*A Village Meeting*



### **Role of Student Union of University of Tampere (TAMY)**

TAMY is a student organization in Finland where according to the Universities Act, all students taking a lower or a higher basic degree at the University of Tampere belongs to TAMY. TAMY organizes various activities, supervises students' interests in study- and degree-related issues, in matters concerning livelihood and health, in equality issues and in many other spheres. Over the years, TAMY has carried out several development cooperation projects in India with GRAVIS. The aim of these projects in India is to promote people's health in the Thar Desert by improving availability of food and clean drinking water in the area and developing the sanitation system for better health.

The current Project *'Improving Health through Addressing Nutrition and Sanitation (IHNS)* activities include developing horticulture units or desert gardens, installing water filters and building toilets. The Project is funded by the Ministry for Foreign Affairs of Finland where part of the funding comes from students' voluntary donations that have enabled them to expand their activities.

### **The Project: Improving Health through Addressing Nutrition and Sanitation (IHNS)**

In mid 2015, GRAVIS and TAMY jointly discussed, developed and launched the Project *Improving Health through Addressing Nutrition and Sanitation (IHNS)*. The overarching goal of this Project was to improve the health status of 40,000 people living in remote villages of Thar Desert with focus on women and children, with greater emphasis on nutrition and sanitation.

Project IHNS was initiated by GRAVIS with the support of TAMY in 2015 and was implemented in 20 remote villages of Jodhpur District, Rajasthan. The Project period was from 2015 to 2017.



*Project area where growing crops is challenging*



## **Project Objectives**

- ▶ Generate awareness on general health in target communities, and with an emphasis on nutrition and sanitation
- ▶ Provide medical services to communities to reduce the prevalence of diseases, in general, and in the context of nutrition and sanitation
- ▶ Develop the capacities of rural communities, GRAVIS team and of workers from other NGOs to understand nutrition and sanitation and to enable them to plan and implement interventions on the issue
- ▶ Enhance nutrition status of communities through physical interventions
- ▶ Mainstream nutrition and sanitation components in overall GRAVIS interventions in the region focusing on associated aspects of food security, water security and general health
- ▶ Research community-based practices and perceptions on nutrition and sanitation, compile best practices and document for future action
- ▶ Advocate and link with the government health services for wider replication of the proposed interventions.

## **Planned Activities**

- ▶ Setting up the project team and their orientation trainings
- ▶ Forming Village Health Committees (VHCs) in project village
- ▶ Trainings of VHCs
- ▶ Identification and trainings of Village Health Workers (VHWs)
- ▶ Awareness camps
- ▶ Community-based trainings on nutrition and sanitation
- ▶ Outreach medical camps
- ▶ Setting up Horticulture Units (HU)
- ▶ Water filters at household levels
- ▶ Trainings for GRAVIS team and other NGO workers
- ▶ Advocacy workshops – district level, state level, national level
- ▶ Research on nutrition
- ▶ Exchange to Finland

## **Achievements Thus Far**

Under this Project, the following landmarks have been achieved:

**(a) Formation and orientation meeting of the Project team**



*Orientation Meeting*

**(b) Formation of Village Health Committees (VHCs) and training**

The project team formed VHCs in all project villages. After the training, the VHCs have been working actively in their villages.

**VHW TRAINING UNDER INHS PROJECT**

Village Health Worker training was organized under IHNS project. During this training VHWs were trained for the primary health care services. As we know in rural areas of Thar Desert community does not have good healthcare facilities because of its scattered geographical area. VHWs were trained on how to give primary first aid to a patient and if the condition is critical then they must be referred to the city hospital. New village health workers (VHWs) were chosen on the basis of distance from the clinic's service point and community willingness to participate fully in the Primary Health Care programme.

**(c) Identification and Training of Village Health Workers (VHWs)**

Twenty VHWs were identified in Project villages and trained by GRAVIS resource team at the GRAVIS hospital. Since then, the VHWs have been working actively in their villages to provide minor health services, health education and referrals to the villagers. The VHWs support project team in organization of awareness camps and medical camps and they work closely with the VHC members of their villages and with government health providers. An exposure visit for VHWs was also organized under which the group went to Udaipur for three days. In Udaipur the group went to an organization known as Jan Jaagran Sansthan, several hospitals and historical sites. The visit was a great learning experience for the VHWs. They came back with more knowledge and greater confidence.



*VHW training*

**(d) Awareness camps**

120 health awareness camps have been organized till date. The camps have been received positively by villagers and they are showing keen interest in the activity. The awareness camps have raised villagers' awareness on nutrition, sanitation and health. About 50% of awareness participants were women.



*Awareness Camp*

**(e) Community-based trainings on nutrition and sanitation**

These trainings aimed at educating rural communities on nutrition and sanitation in an in-depth way. Participatory techniques and innovative educational materials were used for the trainings. The trainings were very well received by the villagers and they felt more knowledgeable on health aspects after attending the event.



*Community - Based Training*

**(f) Outreach medical camps**

The outreach medical camps are well-received by villagers. GRAVIS medical team visited the villages and provided medical and referral services through these camps, as well as health education and counseling. About 45 medical camps have been organized till now.



*Medical Camp*

**(g) Horticulture Units**

The work on setting up these units is currently going on in the villages. Total number of 44 horticulture units were installed between 2015 and 2016. By end of 2017, the units will start yielding fruits, which will provide nutrition and income to the beneficiaries.



*Horticulture Unit*

**(h) Low water use toilets**

Low water use toilets are another important intervention of this Project. Till now, 39 toilets have been built and are ready for use.



*Low Water Use Toilets*



**(i) Water filters**

These filters are bio sand filters and are made locally by rural communities providing safe drinking water to the households in the Project area. By now, all 49 filters has been installed. These filters would provide safe drinking water to the beneficiary families.

**Water Filters For Safe Drinking Water**

Samdu Devi lives with her family in Mahadev Nagar in Charai village of Jodhpur district. In her family she has four sons and four daughters. Some of her children are married and those who are not married live with her. Her husband works in fields and she also works with him some time. She brings water from naadi, which is 3 kms from her home. Before installing bio sand water filter Samdu Devi and her family were drinking dirty water fetched from the naadi. But after drinking water from the bio sand water filter her family is not having any health issues. Before using bio sand water filter her family members especially children were having stomachache, vomiting and other water-related problems. She also noticed that there is change in water colour and its taste. She is happy after having installed bio sand water filter in her house.



*Water Filter*

**(j) Three health conventions were convened**



*Health Convention*



## Study Undertaken

The given study on '*Addressing Health through Nutrition in Thar Desert*' reviewed the Project activities in detail and an objective assessment was made on the state of nutrition in the area. It also suggested the way forward in nutrition and healthcare needs of the residents. Though the Project covers both nutrition and sanitation aspects, the given study focused specifically on nutrition. In order to obtain a wide sample, numerous village households, schools, PHCs, and anganwadi centre were visited and information was collected.

## Methodology

Concerted efforts were made to obtain information from available resources. The areas reviewed included (i) Village Health Workers; (ii) PHC; (iii) households; (iv) toilets; (v) horticulture units; (vi) GRAVIS hospital; (vii) water filters; and (viii) anganwadi workers. More specifically, the methodology included:

- (i) Extensive interaction with the village community
- (ii) Discussion with GRAVIS staff
- (iii) Interaction with service providers like village health workers; gram sabha / panchayat representatives; Public Health Centre (PHC); (d) school staff and children; (e) anganwadi workers and; (f) GRAVIS Hospital staff.
- (iv) Field visit to selected villages
- (v) Data gathering through questionnaire
- (vi) Perusal of reports and other online literature.





## CHAPTER 3

### FINDINGS AND RECOMMENDATIONS

Project IHNS has done commendable work in the villages of Jodhpur district. Launching of various initiatives under the Project purview were feasible due to a high degree of commitment, sincere application, continuing guidance, training of GRAVIS field staff, dovetailing of their initiatives with those of government and other organizations.

Broadly speaking, the study noted that the initiatives taken by GRAVIS in the area of nutrition were well-received by the community and the majority of villagers clamoured for its continuation. The representation of women, marginalized castes and backward communities in Project activities demonstrated an integrated and participatory approach to solve problems. However, it was observed that regular monitoring, sustained training and capacity-building are required.

Various meetings and focused discussions with communities showed that women were aware about the visible signs of malnutrition; they had a clear idea why a child can become malnourished, the importance of first milk, benefits of exclusive and frequent breastfeeding, need of complementary feeding, links between bad hygiene and illness, as well as where to go when children are sick.

However, supply of medicines, consumption of micronutrients by women and children was not very prevalent. This could be either due to lack of availability of material or lack of awareness of their benefits and usage. By and large the households visited were financially well to do and had the basic amenities.

Detailed findings of the given study are given below under broad heads:

#### Key Findings

##### Health and Nutrition

1. Iodized salt was used by some families in their food
2. Some households visited were financially comfortable and had meals three times a day. Quite a few households expressed financial challenges.
3. Consumption of dairy products like ghee, milk, curd and buttermilk was a common practice in many households.
4. Consumption of fruits varied from house to house, village to village. While some residents had fruits like anar, ber, guava, apple (all purchased from local market) regularly, others ate only when advised or prescribed by the doctor.
5. Local vegetables like ker sangri, bajra, millet in various forms were consumed by almost all residents but only few householders consumed green leafy vegetables like spinach, mustard etc.
6. Meat was consumed only in some communities. Rest were mostly vegetarian.



7. Distribution and consumption of dietary supplements like folic acid, iron, vitamin A and other micronutrients was highly variable. Women and children ate supplements only if prescribed by a doctor. Consumption of supplements was mostly irregular either due to unawareness or lack of availability –hospital being far or supply not readily available in the hospital / PHCs.
8. Healthy, nutritious and regular mid-day meal was provided in schools. Anganwadi workers regularly carried food for children between the age group of 7months to 3 years and fed them with healthy food. They also took small children to anganwadi centers to feed and teach them.
9. In 20 villages under this Project, GRAVIS has installed horticulture units comprising both fruit-bearing trees like anar, ber etc and local trees providing vegetables. In last two years, about 44 horticulture units were installed. GRAVIS promoted the idea of setting up of horticulture units or home gardens in the target villages. Fruit trees suited to the desert climate were grown, requiring minimal water / irrigation from domestic wastewater. The units were set up in households, which had the requisite water supply and interest in having home gardens. Typical fruits grown were anar (pomegranate), ber (desert plum), nimbu (lemon) and gunda (gum). These fruits provide both nutrition and vitamin to the families.
10. Villagers were aware of clean drinking water practices like boiling and straining water and also practiced it.
11. Households visited had water filters constructed by GRAVIS under this Project providing clean and healthy water to the householders. However many householders did not know its benefits. More sensitization workshops need to be organized to facilitate knowledge and proper usage of water filters.
12. Diseases like common cold, cough, fever occur either due to weather changes or due to water / food borne infections. There were quite a few cases of tuberculosis as well.
13. School visit: Water in GRAVIS - aided school was not made available by the local panchayat and children, especially girls, were compelled to defecate in the open despite presence of toilets in the school. This point needs urgent attention and immediate intervention by the government.
14. According to villagers medicines provided by GRAVIS were more effective than medicines provided by the government-run PHCs.
15. Almost all residents had access to healthcare facilities provided both by the government and GRAVIS.

### **Women and Children**

1. Most birth deliveries now take place in institutions and practice of home deliveries has substantially reduced.
2. Health facilities were available but villagers had to travel far to reach hospitals for regular checkups. However, ANMs and VHVs provided timely basic health assistance at the local level.



3. Almost everyone reported complicated cases (pregnancies, ill-health of mothers, children and men) to established hospitals / institutions.
4. Children were vaccinated and immunized (BCG, measles, polio, DPT etc) at regular intervals. Villagers particularly women were aware of the immunization programmes of the government and ensured that they and their children were immunized regularly and on time.
5. Women were well aware of the breast-feeding techniques and other health and childbirth practices. They received supplementary food and micronutrients like folic acid, iron and vitamin A from ANMs and VHWs.
6. Majority of the decisions regarding women and children's health and other major household issues were taken by the men of the family, though, in close consultation or on request from the women. It is still a male dominated society.
7. Healthcare centers (PHCs) visited were well-equipped with medicines and doctors were available.
8. Only a few women were educated. They helped family financially by engaging in activities like sewing / farming.
9. Timely medical care provided by VHWs to children and pregnant women, has resulted in significant reduction in health ailments like common cough, cold, tetanus, skin rashes, post delivery illnesses etc.
10. Increased cooperation between VHWs and ANMs was seen.

### **Health Awareness Programmes**

1. Awareness programmes on health, hygiene and sanitation were conducted at regular intervals once every six months by GRAVIS and the state government.
2. Awareness camps were organized both by GRAVIS and the state government in the villages visited. At least four times in a year these camps were organized. Villagers were informed about the following:
  - ▶ Ill-effects of open defecation
  - ▶ Need for usage of toilets
  - ▶ Clean drinking water practices
  - ▶ Washing of hands
  - ▶ Nukkad nataks
  - ▶ Puppet shows
  - ▶ Rally by school students to sensitize the community about health, hygiene and sanitation and its effects on the local environment were organized by the state government.



3. Village Health Workers (VHWs) have been trained in basic healthcare and first-aid. VHWs are also trained as birth attendants.
4. Regular medical camps, immunization drive, health checkups and training programmes on preventive health (malaria, dengue and other seasonal diseases) have been an integral part of GRAVIS healthcare interventions. Villagers have benefited tremendously through these awareness camps and programmes. These have enhanced their awareness. They are reaping the benefits from government-run healthcare schemes and are making use of the facilities provided by GRAVIS and the local government. Almost all go to hospitals now rather than using indigenous methods. Most child deliveries now take place in government hospitals, PHCs or GRAVIS hospital.
5. Marked improvement in health awareness has taken place after start of this Project
6. Keen, voluntary and large participation by villagers in health programmes is seen as a positive development.

### **Nutrition Transforming Health of Rural Families**

Chunaram and his family belong to a Bhil community. His wife is a Village Health Worker (VHW). As part of this visit, my interactions were mainly with Chunaram's wife and his daughter-in-law. They informed me that besides eating nutritious food, which included milk, ghee, curd, buttermilk they also ate non-vegetarian food especially goat meat and eggs. Their community was mainly non-vegetarian. They were healthy and got most of their nutrients from non-vegetarian food. They also ate fruits regularly, which were purchased from the nearby market.

With help from GRAVIS, Chunaram's household had a horticulture unit and taanka in his house. He regularly stored water in his taanka for household purposes including watering his plants in the horticulture unit. All this was possible due to GRAVIS. Chunaram's family was well aware of healthy eating practices and its benefits. The family took good care of their horticulture unit. Since Chunaram's wife was a VHW she was aware of the benefits of eating nutritious meals and ensured that her family ate healthy food. She played a significant role in not just sensitizing her own family but also members of her village.

Preparing for and responding to the challenges of malnutrition is a collective and collaborative effort of the community and government at local, block, district and state levels. Only joint efforts could mitigate the impact of under nutrition. The Project progressed well but linkages would need to be developed and strengthened among various stakeholders. Synergy among stakeholders needs to be created to ensure effective monitoring and timely and judicious application of resources.



## RECOMMENDATIONS

Impact of any programme depends on effective dissemination of information. It is a team effort and every individual is a catalyst in changing the existing scenario. GRAVIS has come a long way and has brought significant changes in the village community. But the process needs to continue on a long-term basis. Regular interventions are essential. The current Project needs to be carefully nurtured and various activities are required to be monitored and further strengthened. For this purpose the following recommendations are made for consideration and appropriate action:

### 1. Strengthening of Village Health Workers

To address the need of local support for the community to provide basic health services and educate the community on preventive aspects of health care, GRAVIS has organized various training workshops for village health workers (VHWs). They have been trained to generate awareness on immunization, hygiene and sanitation, common diseases, nutrition, women and children's health issues and family planning. Among the VHWs, few were also trained as traditional birth attendants (TBA). These TBAs have received training on various safety measures, ensuring early initiation of breast feeding (colostrum) and proper post natal care to reduce chances of obstetric infections. Special emphasis is given on educating the village residents on preventive care like safe drinking water, hygiene of self/water/food, sanitation, motivation to complete immunization routine and ante natal checkups. However these programmes need to be carried to more areas for greater benefit. It is also suggested that besides immunization and reproductive health education, women should also be educated on ailments like cancer – breast and cervical, menstrual health, and regular health checkups.

A lot more effort needs to go into educating women on personal hygiene. It was also observed that women start giving food to their children only after a year or more since birth. Till then the child is only breast fed. This leads to malnutrition both in the mother and the child. There needs to be a greater handholding in this by the VHWs. The VHWs need to regularly motivate mothers to make daliya, cooked rice and dal water for the infants to overcome under nutrition problems in children.

### 2. Educating Women and Children

Health and education are interrelated. No health programme would be successful if people were not educated and made aware. It is imperative that children both boys and girls were educated and sent to schools. If they were better informed they could help their families and eventually their community and society.

Female education also needs a bigger push. A large number of girls do not attend school. Self-awareness about health is lacking and women suffer more because of dependency on males for decision-making and material support. The improvement in this area has been slow and more attention needs to be given to this problem. Educating both boys and girls from early age in GRAVIS schools about health, nutrition, hygiene and sanitation will bring about the necessary behavioural change in the community at large.

### 3. Increasing Frequency of Health Awareness Programmes

The village community requested if the frequency of medical awareness camps could be increased in the



area to every two months. The study endorses this demand. There was a great demand among the participants that the health awareness camps during change of season would be more useful. Besides malaria, villagers also need to be informed about swine flu, typhoid, dengue, chickenguniya and other gastrointestinal diseases. It was realized during the study that the most effective and quickest way of spreading awareness in rural areas of Thar region is through word of mouth. Programmes can be effectively implemented if fellow villagers speak about it. This needs to be examined, further strengthened and enhanced.

#### 4. Maintenance of Horticulture Units

To increase the nutritional value amongst the villagers, GRAVIS through this Project promoted the idea of setting up of *horticulture units* or *home / kitchen gardens* in the target villages. These *horticulture units* were set up in the close vicinity of the houses. Fruit trees, requiring less water/usage of domestic waste water and suited to the desert climate, were grown. These units are set up in households, which have the requisite water supply and interest in having *home gardens*. Typical fruits grown are *anar* (pomegranate), *ber* (desert plum), *nimbu* (lemon) and *gunda* (gum). These fruits provide both nutrition and vitamin intake to the families. Fruits and vegetables grown in these units not only provide nutrition and vitamin to the families but also provide greenery and beautify the surroundings.

Though horticulture units would meet most of the nutritional needs of the villagers, there was little interest among people to apply seriously and sincerely in learning and promoting horticulture units. They expected GRAVIS to undertake whole range of horticulture activities. Therefore it is important that GRAVIS field staff regularly visit these households and motivate the villagers to maintain their kitchen gardens.

#### 5. Usage of Bio-Sand Water Filters

In India, approximately 1,500,000 children die each year due to water contamination. Many women must travel long distances to find water and school aged girls are not able to go to school because of their water fetching duties. In times of drought, these conditions worsen as people must search for more remote water sources to survive. If families are unable to find water they must either pay thousands of rupees for water tankers or are forced to migrate into city slums. To meet this challenge of the villagers in Thar region, GRAVIS has set out to promote more traditional methods of water security by setting up bio-sand water filters. This technology uses local materials to filter and clean drinking water. A concrete box about 1 m tall is filled with a layer of coarse gravel, finer gravel, and a larger layer of sand which filters the water. Above is a liquid layer containing micro-organisms, which consume pathogens in the water. On top is a diffuser, which protects the filter contents when water is poured in for filtration. After the water passes through all these materials it flows out of a tube and into a sealed water storage unit. This technology costs between 500 and 1,000 rupees and GRAVIS's goal is to install a filter with every taanka and beri. Setting up of these water filters has helped in the following:

- ▶ Reduced incidence of water-borne diseases like cholera, diarrhea, tapeworm, skin rashes etc and
- ▶ Helped saline, undrinkable water become sweet, light and drinkable after filtration



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## ABBREVIATIONS

ANC	ANTENATAL CARE
ANM	AUXILIARY NURSE MIDWIFE
CHC	COMMUNITY HEALTH CENTRE
GDP	GROSS DOMESTIC PRODUCT
GOI	GOVERNMENT OF INDIA
GRAVIS	GRAMIN VIKAS VIGYAN SAMITI
HU	HORTICULTURE UNIT
IHNS	IMPROVING HEALTH THROUGH ADDRESSING NUTRITION AND SANITATION
LBW	LOW BODY WEIGHT
NFHS	NATIONAL FAMILY HEALTH SURVEY
PHC	PRIMARY HEALTH CENTRE
RDA	RECOMMENDED DIETARY ALLOWANCE
TAMY	STUDENT UNION OF UNIVERSITY OF TAMPERE
UNICEF	UNITED NATIONS INTERNATIONAL CHILDREN'S EMERGENCY FUND
VDC	VILLAGE DEVELOPMENT COMMITTEE
VHC	VILLAGE HEALTH COMMITTEE
VHW	VILLAGE HEALTH WORKER
WHO	WORLD HEALTH ORGANIZATION

## GLOSSARY

Anar	Pomegranate
Anganwadi	Anganwadi is a government sponsored child-care and mother-care center in India. It caters to children in the 0-6 age group. The word means "courtyard shelter" in Hindi.
Bajra	Pearl millets
Ber	Desert plum
Beri	A pitcher-shaped structure that catches rainwater and stores it
Gunda	Gum
Naadi	Pond
Nimbu	Lemon
Panchayat	An administrative unit comprising of a few revenue villages
Sangri	Pod of a tree Prosopis Cineraria (Khejri)
Taanka	Underground water storage structure



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