

Evaluating Drivers of Dietary Diversity Amongst the Tribal Populations of the Adilabad District

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When I first boarded the plane in Detroit to set off for my Indian adventure, I did not quite comprehend how this transition was any different than the 523 miles between my home and D.C. I thought that I had been through this process before, why would 8,155 miles be any different? I was confident I could bring the same determination and passion I had in the Senate with me half way around the world to ICRISAT. After arriving at ICRISAT, my first few days at work were difficult. Difficult in the sense that much of my work would be set at my own pace, and it would always be my own responsibility to set deadlines. But luckily, being around a world-class team of researchers brought out the most driven aspects of my personality. Every day I was treated as staff member, not as a seventeen year old with limited formal research experience.

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ABSTRACT

This study falls under the ongoing “Nutri-Food Basket” project. This project aims to understand the dietary diversity of pregnant women, lactating mothers, children (ages 3-5), and adolescent girls (11-18 years) in the Utnoor and Tiryani mandals in the Adilabad district of Telangana, India. The purpose of the project is to expose the tribal population to affordable and available nutritious foods and supplement existing village diets with smart foods to address the high prevalence of anemia and malnutrition amongst tribal populations.

This internship study will help determine the drivers of food choice in pregnant women, lactating mothers, children, and adolescent girls of the tribal households in Adilabad. Such research will enable tribal households to transition from nutrient deficient diets to the consumption of diverse nutritional food through awareness development and capacity building.

The study will be used to analyze the “whys” and “hows” that emerge from the data and insights collected by the “Nutri-food Basket” project. In addition to the project summary and

insights, focus group discussions composed of village women and adolescent girls were conducted in each mandal for qualitative analysis. To gain a more comprehensive understanding of government nutritional development programs, the study also included key informant interviews with Anganwadi teachers working under the ICDS scheme.

The dietary behavior analysis of tribal populations enables a shift towards evidence-based implementation of government nutritional programs in the state of Telangana. Following this study, additional studies to be conducted in other tribal villages across India to reaffirm the effectiveness of the Nutri-food Basket model across varying cultural practices.

Keywords: ICDS, Anganwadi, Nutri-Food Basket, Adilabad, Village Level Studies

ACRONYMS

ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
FGD	Focus Group Discussion
ICDS	Integrated Child Development Services
VLS	Village Level Studies
MIND	Markets, Institutions, Nutrition, and Diversity
SDG	Sustainable Development Goals
ST	Scheduled Tribe
BC	Backward Caste
OC	Other Caste
AWC	Anganwadi Center
MCWD	Ministry of Women & Child Development
ANM	Auxiliary Nurse Midwifery
MO	Medical Officer
AWW	Anganwadi Worker
MHFW	Ministry of Health and Family Welfare
THR	Take Home Rations
ASHA	Accredited Social Health Activist
PDS	Public Distribution System
CDPO	Child Development Project Officer
NFHS	National Family Health Survey
TPDS	Targeted Public Distribution System
UN	United Nations

1. Introduction and Background

1.1 Personal Remarks

The 2030 Agenda spearheaded by the United Nations and its 193 member states puts forth ambitious goals across a broad number of sustainable development issues. Goal number two, Zero Hunger, aims to ensure access to food for all people and eliminate malnutrition among vulnerable populations such as children, adolescents, lactating mothers, and pregnant women.

After interning at the United Nations the summer of 2016, I learned the importance of not only policy analysis but the need to experience fieldwork as well. The data collection process was one of the most memorable and humanizing experiences of my life. As someone interested in policy at the administrative level, I never had any experience working in the field prior to my work in India. Being able to interact with tribal villagers while conducting my surveys reminded me that the policies I research have real implications for real people. Because of this experience, I have a constant reminder to let empathy guide my actions as a leader and global citizen. As changemakers wanting to help reach and sustain goals such as zero hunger, we have to develop a comprehensive understanding of social and cultural barriers in order to make strides towards achieving our goals as an international community.

1.2 International Crops Research Institute for Semi-Arid Tropics (ICRISAT)

Founded in 1972, the International Crops Research Institute for Semi-Arid Tropics (ICRISAT) is an international non-profit organization that employs partnerships and inclusive market-oriented development to alleviate poverty in the semi-arid tropics. In Sub-Saharan Africa and South Asia, ICRISAT is committed to the UN Sustainable Development Goals and works across the agricultural value chain to build agribusiness and work towards sustainable agricultural intensification. ICRISAT is a member of the Consultative Group for Agricultural Research (CGIAR Consortium), an ad-hoc global partnership that brings together international agricultural research centers, governments, philanthropic foundations, the UN Food and Agriculture Organization (FAO), the International Fund for Agricultural Development (IFAD), the UN Development Programme (UNDP), the World Bank, the European Commission, the Asian Development Bank, the African Development Bank, and the Fund of the Organization of the Petroleum Exporting Countries (OPEC Fund).

ICRISAT spearheads research in the areas of poverty and hunger, malnutrition, environmental degradation, empowering women, climate change, and digital agriculture. In order to achieve its program goals, ICRISAT employs its vast knowledge of the drylands- an environment spanning across 55 countries in Asia and Sub-Saharan Africa and inhabited by 2 billion people, 644 million of which are suffering from poverty (ICRISAT, 2017). ICRISAT's multidisciplinary approach to research combines social and business understanding with biophysical advances.

1.2.2 Markets, Institutions, Nutrition, and Diversity (MIND) theme under the Global Program on Innovation Systems for the Drylands

During my time at ICRISAT, I researched under the Markets, Institutions, Nutrition, and Diversity (MIND) theme led by Dr. Michael Hauser. The theme applies a socio-economic approach towards analyzing resource and development economics, social science, and policy and institutional analysis. One of the key relationships the MIND program studies is the interaction between agricultural innovations and household constraints such as cash flow, labor, health and nutrition, gender relations at the household and community level. My mentor at MIND was Dr. R. Padmaja, ICRISAT's Senior Gender Scientist.

1.3 Project Objectives

Because the cultural values of tribal populations vary significantly based on region, this study will focus on the tribal villages of Adilabad District of Telangana. The primary objectives of this study are:

1. To understand the tribal social and cultural norms that influence eating behavior
2. To understand changes in dietary pattern in the study population
3. To determine the influence of government campaigns (specifically ICDS and PDS) has on the dietary pattern of the study population

2. Review of Literature

India has a Global Hunger Index ranking of 67 out of 80, a ranking lower than both North Korea and Sudan (Save the Children, 2016). Despite government sponsored nutrition programs spanning back decades, in India, 44% of children under the age of five are underweight, while 72% of infants are anemic. Additionally, 28.1% of children (0-5 years) experience stunting, while 49.8% of pregnant women (15-49 years) are anemic (<11.0g/dl) (Save the Children, 2016). Stunting, an example of an effect of malnutrition, contributes to one third of deaths for children under five, and negatively impacts a child’s health, cognitive capacity, school performance, and productivity during adulthood (UNICEF, 2015). Of India’s 11.5 million tribal children under the age of 5, 6.2 million suffer from stunting (UNICEF, 2015). Malnutrition in tribal populations is the result of co-related factors such as household poverty, food insecurity, and maternal nutrition during and before pregnancy (UNICEF, 2015). As shown in *Figure 1*, the National Family Health Survey (NFHS) high rates of undernourishment across all of India’s states; however, India is also struggling with the dual burden of undernutrition and overnutrition (Government of India Planning Commission, 2017).

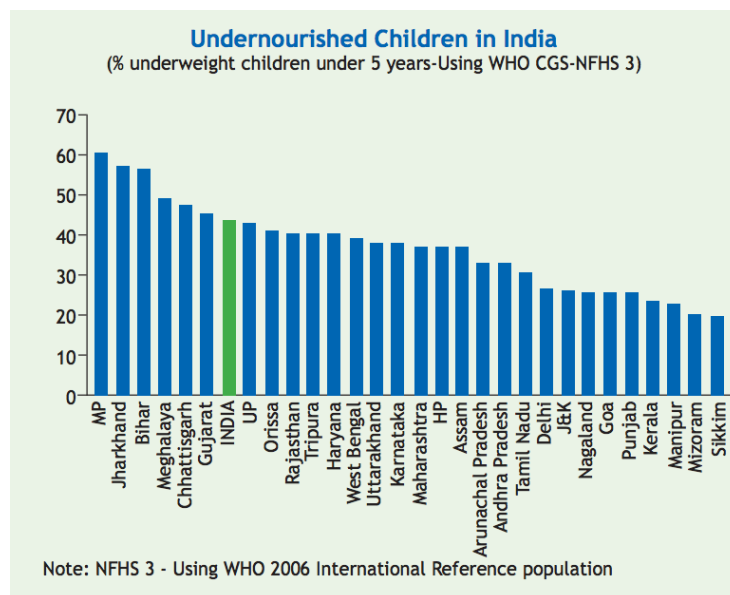


Figure 1: Undernourished Children in India
Source: Government of India Planning Commission

2.1 Malnutrition in the World

Malnutrition is presented in the forms of child stunting, child wasting, child overweight, adult overweight, micronutrient deficiency, adult obesity, and noncommunicable diseases (UNICEF, 2016). Almost half of all deaths of children under 5 are caused by undernutrition. Undernutrition results in greater risk of common infections, increases the frequency and severity of such infections, and causes delays in recovery time. Additionally, poor nutrition during a child's 1000 days can cause stunting, a condition that impairs cognitive ability and lowered performance in work and school (UNICEF, 2017). In Africa and Asia, 11% losses in gross domestic product represent the economic consequences of malnutrition. Conversely, preventing malnutrition creates a \$16 return on investment for each dollar (UNICEF, 2016).

2.2 Adilabad District Profile

The Adilabad District in northern Telangana is composed of 18 different mandals, 1,590 inhabited villages, and a rural population of 1,980,980 (Directorate of Census Operations Andhra Pradesh, 2011). This study uses data gathered from the Utnoor and Tiryani mandals of the district. In the Utnoor mandal, there are currently 39 villages, while in Tiryani there are 37. Villages in both mandals are composed of mostly scheduled tribes and backward castes, officially designated socio-economically disadvantaged tribal populations. In 2006, Adilabad was named one of the 250 most backward districts by the Indian Government with approximately 18% of the population belonging to a scheduled tribe (Directorate of Census Operations Andhra Pradesh, 2011). The district currently receives funding from the Backward Regions Grant Fund Program (BRGF) (Ministry of Panchayati Raj, 2009).



A tribal village in the Utnoor mandal

The most recent census data on the Adilabad District is from 2011 (*Figure 2*); therefore, it is noted that the data does not most accurately represent current populations and malnutrition rates. Most of the available government materials regarding Adilabad also refer to it as the district of erstwhile state of Andhra Pradesh although, as of 2014, Adilabad is a district of Telangana. Additionally, in October 2016, the district was further divided into smaller districts: Adilabad,

Komaram Bheem- Asifabad, Mancherial, and Nirmal. The Tiryani mandal is now part of the newly formed Komaram Bheem-Asifabad District. Moreover, the Tiryani data used was gathered prior to the mandal's regrouping into Komaram Bheem-Asifabad district (circled in red on the map below).

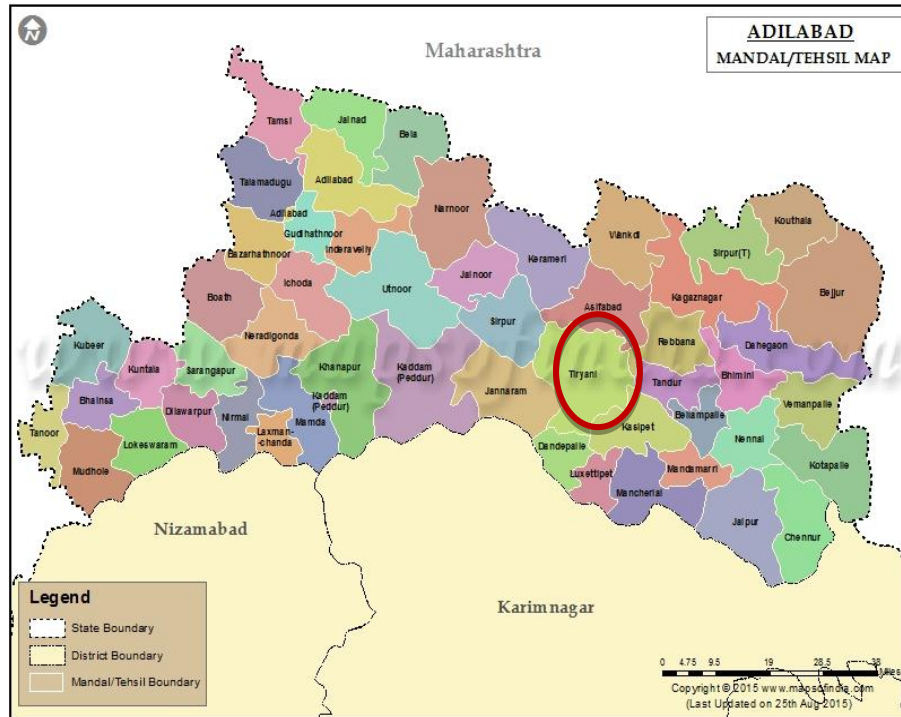


Figure 2: Map of the Adilabad District and its mandals.

2.3 Adilabad District Nutritional Profile

In the Adilabad district, approximately 71% of pregnant women and children (0-5 years) and 52.3% of adolescent girls (10-19 years) suffer from anemia (Ministry of Health and Family Welfare, 2012). Anemia in women, caused by iron deficiency, can result in increased risk of low birth-weight or prematurity, perinatal and neonatal mortality, inadequate iron stores for newborns, maternal morbidity and mortality, lowered physical activity, mental concentration, and productivity (Bentley and Griffiths, 2003). Even women suffering from mild cases of anemia may experience fatigue and a reduced work capacity (Bentley and Griffiths, 2003). There are no anemia statistics available on the percentages of the tribal populations of Adilabad, but it can be predicted that because of low nutritional literacy and insufficient access to food, anemia remains high in the villages. The Human Development Index (HDI) that is used to measure the overall status of human development is the lowest for scheduled tribes of Telangana at 0.257, followed by scheduled castes (0.348) and backward castes (0.397). Using the UNDP methodology, HDI accounts for life expectancy, literacy rate and school enrollment rate for knowledge, and per capita gross domestic product (GDDP). From this data, it is concluded that for these vulnerable populations, there has been no relative position change in social structure. For STs and SCs, their relative HDI has remained the same since 2002-2004. The consistent lower standards of living and education rates have caused the HDI for STs and SCs to remain stagnant (Centre for Economic and Social Studies and Government of Telangana Planning Department, 2017).

2.4 Gond Tribe

With a history dating back several thousand years, the Gond tribe is considered one of the most ancient tribes and isolated in India. The Gonds still preserve many of their own traditions with little homogenization with emerging Indian traditions. The Gonds are the largest Indian tribe with 4-5 million members spread across northern Telangana, Andhra Pradesh, eastern Maharashtra, eastern Madhya Pradesh, Jharkand, and western Orissa (Vahia, 2013). The Gonds are a scheduled tribe that fall under the government's social and economic welfare and developmental measures. However, at 17.16% in 1991, the literacy rate among the tribal populations of Andhra Pradesh remains the lowest of all other tribal states (Sujatha, 2002).

Although there is limited nutritional data gathered on the Gonds in the region that is now Telangana, the data gathered on the pre-school age Gonds of Madhya Pradesh shows that more than 60% of surveyed pre-school children are underweight. In addition, it is observed that 86.7% of the children suffer from anemia, while 71.1% show characteristics of moderate and severe anemia (Rao et al., 2004).



Conducting a focus group discussion with a group of Gond adolescent girls.

2.5 Measuring Dietary Diversity

While analyzing intra-household food and nutrient allocation, differential food allocation exists. At the most basic level, adults are typically given more food than children. This statement can be understood through a functional, cultural, and resource-control model. Through the functional lens assumed that the primary goal of the family is to survive and reproduce; therefore, resources are allocated accordingly to achieve such goals. Under this model, the most “productive” members of the family receive the largest quantities of food in times of shortage, while members receive almost equal shares when food is in abundance. In the functional model, there is little

understanding that pregnant and lactating women require additional supplementary nutrition because they are generally perceived as non-productive. Additionally, because daughters leave the home because of marriage at a young age and only contribute to family productivity for a short period of time, sex discrimination is a common occurrence (Wheeler, 1991).

In the cultural model, food is allocated based on the individual's standing within the society. The cultural model reaffirms the patriarchal characteristics in most societies, with men and older adults having priority over women and children (Wheeler, 1991).

The resource control model emphasizes the material and power relations within the household. In this model, power is determined by how income and other goods and services are distributed within the household. Even if a woman is earning or producing, power is determined by the woman's ability to keep possession of the earned materials (Wheeler, 1991).

2.6 Integrated Child Development Services (ICDS) Scheme

Launched by the Government of India in 1975, ICDS was developed to support the nutritional development of children ages 0-6, pregnant women, and lactating mothers (Ministry of Women and Child Development, 2009). The program's objectives are to improve the nutritional and health status of children ages 0-6; lay the foundation for proper psychological, physical, and social development of children; develop effective coordination of policy and implementation of various child development programs in different government departments; and enhance a mother's ability to meet the health and nutritional needs of children through nutritional literacy programs (Ministry of Women and Child Development, 2009). *Table 1* shows the different services offered in the ICDS scheme and lists the channels by which the programs are implemented. As of 2015, out of the 1.5 million Anganwadi centers (AWCs) approved under ICDS, 535,499 AWCs are located in rural or tribal areas (UNICEF, 2015).

Services	Target Group	Service provided by
(i) Supplementary Nutrition	Children below 6 years, Pregnant & Lactating Mothers (P&LM)	Anganwadi Worker and Anganwadi Helper [MWCD]
(ii) Immunization*	Children below 6 years, Pregnant & Lactating Mothers (P&LM)	ANM/MO [Health system, MHFW]
(iii) Health Check-up*	Children below 6 years, Pregnant & Lactating Mothers (P&LM)	ANM/MO/AWW [Health system, MHFW]
(iv) Referral Services	Children below 6 years, Pregnant & Lactating Mothers (P&LM)	AWW/ANM/MO [Health system, MHFW]
(v) Pre-School Education	Children 3-6 years	AWW [MWCD]
(vi) Nutrition & Health Education	Women (15-45 years)	AWW/ANM/MO [Health system, MHFW & MWCD]

Table 1: ICDS Services
Source: Government of MWDC, 2009

One of the primary functions of the ICDS scheme is to provide supplementary nutrition to children, pregnant, and lactating women. As of 2009, the Indian government has requested its state governments to provide 300 days of supplementary nutrition to beneficiaries (MWCD, 2009). Through at least one provided meal a day, the scheme works to bridge the gap between the Recommended Dietary Allowance (RDA) and the Average Daily Intake (ADI) (MWDC, 2009). The approximate calorie and protein value of the government issued nutritional supplements are expressed below in *Table 2*. The ICDS scheme states that it provides children with foods such as milk, banana, egg, seasonal fruits, micronutrient-fortified foods, and a home-cooked meal. In addition, children under the age of 3 and pregnant and lactating women receive take home rations composed on pre-mixes and ready-to-eat-foods (MWDC, 2009).

Beneficiaries	Calories	Protein (g)
Children (6 months – 72 months)	500	12-15
Severely malnourished children (6 months – 72 months)	800	20-25
Pregnant women and lactating mothers	600	18-20

Table 2: Nutritional Norms in ICDS
Source: Government of India MWDC, Revised Nutritional Norms in ICDS, 2009

Not only is malnutrition linked with food accessibility and insecurity, but it is also the result of poor feeding practices. Under ICDS, children classified as severely malnourished are provided with double the rations. But because the nutritional status of Anganwadi children is rarely recorded and categorized into grades for growth, there are no significant variations in the amount of food each child receives. Each child is allocated the same amount of food, disregarding factors such as growth and age (Farzanaalim and Farhatjahan, 2012).

2.7 Public Distribution System (PDS)

The Public Distribution System (PDS) has existed in India since its introduction to Bombay by the British Government in 1939. Initially, the purpose of the program was to ration food to urban areas and stabilize food prices under rapid inflation. As time passed, PDS was kept in place to protect workers in urban areas from the slow and uneven growth of food production (Ramaswami, 2001). Introduced in 1997, the Targeted Public Distribution System (TPDS) stemmed from PDS and distributed a fixed entitlement of food grains, rice and/or wheat to households suffering from poverty at a rate of 20kg per household per month (As of April 2000) at a subsidized price (Planning Commission Government of India, 2005). However, after the introduction of TPDS, recent studies have shown that difficulties of access and corruption within the program have caused limited rations reaching the poor (Ramaswami, 2001).

2.8 Conclusion

The tribal villages of the Adilabad District are of the most backward in the country. In these villages malnutrition remains high, while there is little information available on their daily diets. The dietary diversity of a tribal population is not only affected by cultural and social practices, but also by programs such as ICDS and PDS. Such programs have been implemented at the state

level; however, the extent to which the programs have achieved their goals and affected the diets of the tribal populations will be further explored in this report using the primary data gathered from the Tiryani and Utnur mandals.

3. Methodology

In the study, I gathered my data for qualitative analysis by conducting focus group discussions and key informant interviews. The surveys took place across the tribal mandals of Tiryani and Utnoor. The data gathered will serve as case studies to support the research gathered through literature review, as well as test the hypothesis emerging from this report.

Dietary diversity is a qualitative measure of food consumption that reflects the household's access to a variety of foods and nutrition adequacy of the study population's diet (European Union and Food and Agriculture Organization, 2013). Dietary diversity data can be gathered at either the household or individual level. In this study, I have chosen to analyze the diets of the following groups: pregnant women, lactating mothers, children, and adolescent girls. Because I have chosen specific groups to study, the individual-level questionnaire provides the most relevant data for my research.

3.1 Focus Group Discussions

After conducting literature review on measuring dietary diversity, the cultural practices of local tribes, and current government programs that affect the daily diets of the tribal people, I developed a questionnaire used for four focus group discussions in the Tiryani mandal of the Adilabad District. A questionnaire was developed for the two focus group discussions that took place with 8-9 adolescent girls, and a separate questionnaire was developed for use with two groups of 8 pregnant and lactating women. Initially, four additional focus groups were planned to take place in Utnoor as well; however, because of health issues, we were unable to conduct the additional discussions.

The questionnaire for the pregnant and lactating focus group consisted of questions regarding daily diets, cultural-related food practices, basic literacy, and hygienic practices of the tribal women. A similar questionnaire was used for adolescent girls, with the exception of excluding questions asking about knowledge of the specific diets of target groups such as pregnant women, lactating mothers, and children. Additionally, the adolescent questionnaire included questions regarding age of marriage and extent of education. Each pregnant and lactating focus group discussion lasted between 55-90 minutes. Contrastingly, each adolescent focus group lasted between 45-60 minutes. The participants of each focus group were selected randomly from the study population, while the questions were asked through a Telugu-speaking translator.



Focus group discussion with pregnant and lactating women.

3.2 Key-Informant Interviews

To supplement the data gathered from the perspectives of the beneficiaries of the ICDS scheme, I conducted 14 key-informant interviews with randomly selected tribal Anganwadi teachers. 11 of the interviews took place in the Tiryani mandal. Initially we planned to conduct 12 interviews in Tiryani and 12 in Utnoor; however, because of health complications, we were only able to conduct 14 interviews total. In Tiryani, we were unable to conduct the last interview, after encountering difficulties accessing the remote villages in the rain. As we moved to Utnoor, we were only able to conduct 3 interviews due to health reasons.

Each Anganwadi teacher is responsible for managing the daily functions of the Anganwadi, and some teachers are responsible for Anganwadis that provide services to multiple villages. While conducting each interview, we asked questions regarding attendance, services provided, challenges facing the program, health status of program participants, and evaluations of the overall infrastructure and resources of each center. To answer questions regarding attendance, most of the Anganwadi teachers referred to the limited records kept of those using the center's services. Each interview lasted between 30-60 minutes.

The same Telugu-speaking translator from the focus group discussions was used in the key-informant interviews. However, in the Utnoor mandal, a translator fluent in the local tribal languages was employed to gather additional information from the Anganwadi teacher.



Key-informant survey with an Anganwadi teacher (far right).

3.3 Limitations

The reason this study is a case study is because there is no pre-existing data published on the dietary trends of tribal villages of Tiryani and Utnoor. In this study, I analyze trends that I observe within my own collected data, but further research should be conducted to confirm such trends at a macro level. The most obstructing limitation for my research was the timeline of the internship. Because the Borlaug-Ruan International Internship lasts only two months, I was not able to spend as much time in the field gathering survey responses. And as aforementioned, the data is not equally distributed between the two mandals, because I had to leave the field before I was able to complete data collection in Utnoor. In addition, I was unable to gather data from a third interior tribal mandal, the Kasipet mandal, due to the poor road conditions caused by monsoon season.

While conducting the focus group discussions and key-informant interviews, another obstacle I encountered was the use of a translator. Because I had to rely on a translator to communicate with the respondents, there was no way for me to ensure that the question was asked the same way in each interview and focus group. Due to the language barrier, there was no way for me to ensure that the translator was not prodding for certain answers.

Finally, another major constraint was the high levels of illiteracy among the focus group respondents. It was difficult to get necessary responses for questions that asked about their perceptions of healthy foods, because respondents in both the pregnant and lactating and adolescent girl focus groups were mostly unfamiliar with the concept of nutrition. Of the focus group respondents, 98% of the adolescent girls were illiterate, while most of the pregnant and lactating women did not attend school past the grade 6. We would get answers stating that a certain hygienic practice is bad, but most FGD participants had no knowledge as to why the practice is bad.

4. Results and Analysis

This descriptive analysis focuses on connecting the perceptions of governmental program beneficiaries (lactating mothers, pregnant women, and adolescent girls) with the perceptions of the government worker in charge of implementing the specific program. To answer questions regarding the ICDS scheme and PDS program, the data gathered in this case study establishes the Anganwadi program as the government program and the Anganwadi teachers as the government workers responsible for program implementation. Responses gathered in the focus group discussions and key-informant interviews are used to answer the following objectives:

1. Understand the tribal social and cultural norms that influence eating behavior
2. Understand changes in dietary pattern in the study population
3. Determine the influence of government campaigns (specifically ICDS and PDS) has on the dietary pattern of the study population

4.1 Effects of Anganwadi Administration on the Daily Diets of Target Populations

Among the 14 interviewed tribal Anganwadis, 100% of the Anganwadi teachers stated that one of their primary program goals is to provide children (ages 0-6), lactating mothers, and pregnant women with a meal a day and stated that providing supplementary nutrition is a daily service. The meals offered to the children are typically composed of dal, rice, egg, and dry take-home rations provided by the Child Development Program Officer or other state governmental department. In addition, based on seasonal availability, vegetables are purchased by the Anganwadi teacher. Of the surveyed Anganwadis, 21.4% reported irregular shipments of government rations by the PDS. It should be noted that in the case that a village cultivates significant yields of vegetables, Anganwadi teacher distribute such vegetables. In this case, the Anganwadi is not altering the composition of the daily diets of those attending the Anganwadi, because the cultivated vegetables are already widely consumed in the village.

Public perception shows that Anganwadis are generally viewed favorably in the village and are known to provide supplementary nutritional services to children; however, it is unclear whether the program affects the daily diets of pregnant women and lactating mothers. Although majority of the villages view Anganwadis as a source of government benefits, 85.7% percent of Anganwadi teachers could not confirm that the distributed food to the beneficiaries' homes was actually being consumed. Additionally, 42.9% of Anganwadi teachers reported that pregnant and lactating women in their village are uninterested in the food provided by the Anganwadi; many times, the Anganwadi teachers are forced to call the women to come pick up food from the center.

The food distributed to the children is consumed, because the children are given the food while they are at the Anganwadi for childcare or pre-school education. *Figure 3* confirms that villagers generally associate Anganwadi with services provided for children such as daily meals, childcare, iron tablets, and the development of school habits. Contrastingly, the only service for pregnant and lactating women described in the public perception question is health referrals. The supplementary nutritional services for pregnant and lactating women were not described under public perceptions in any of the key-informant interviews.

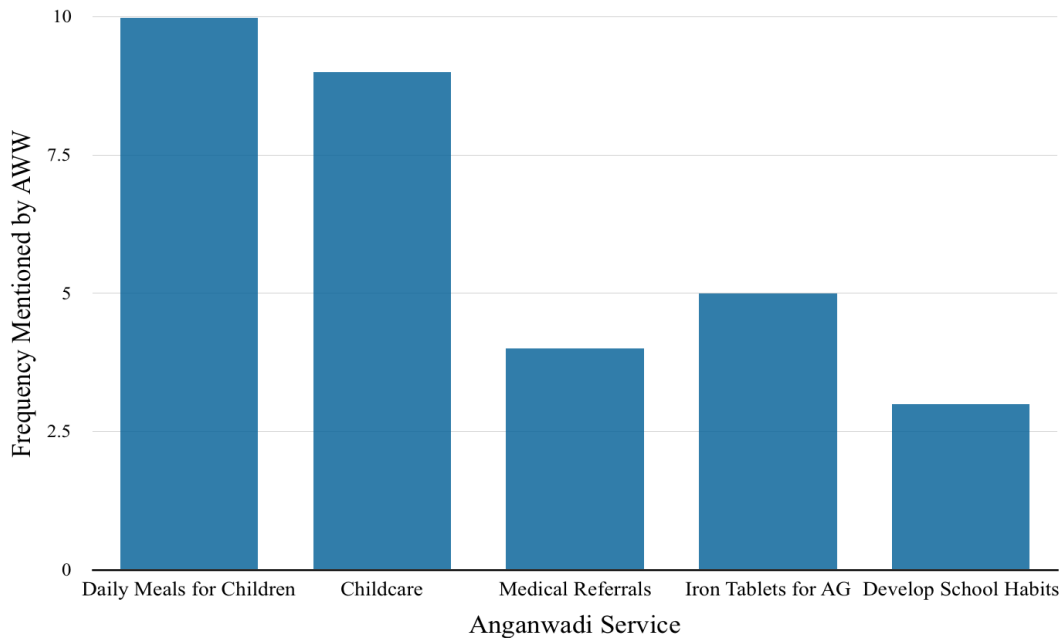


Figure 3: Anganwadi Services Villagers View as Useful
***Each AWW listed multiple services*

Whether Anganwadis affect a village’s dietary diversity also depends on the location of the village. For example, in our case studies, four Anganwadis centers were responsible for providing services to one or more surrounding villages as well. Although these centers offer their services to surrounding villages, half of such centers described low to no attendance and high dropouts rates among attendees from surrounding villages. The respondents attributed such attendance problems to poor transportation. Parents who work in the fields throughout the day cannot afford to take their children to and from the Anganwadi in the neighboring village; therefore, their children are not receiving the supplementary nutrition provided by the Anganwadis.

The issue of transportation is also prevalent for Anganwadis serving single villages. 40% of Anganwadis serving individual villages cited poor transportation as the cause of their attendance issues. Many of the Anganwadis struggling with attendance are located in interior locations only accessible by dirt road. These Anganwadis are usually located apart from the villagers’ homes.

Key takeaway: The location of AWC matters in accessing the services offered by the program and reaching the target beneficiaries effectively.

As shown in *Figure 4*, the Anganwadis are conducting formal and informal health campaigns with varied frequency throughout the year. Informal Anganwadi health and nutrition “campaigns” are conducted when local ASHA officials and doctors offer tips during monthly check-ups, vaccinations, and referral services. Some of the Anganwadis surveyed mentioned formal collaboration with the CDP on their campaigns; however, such collaborative campaigns are not widespread, despite the surveyed Anganwadis being in the same mandal.

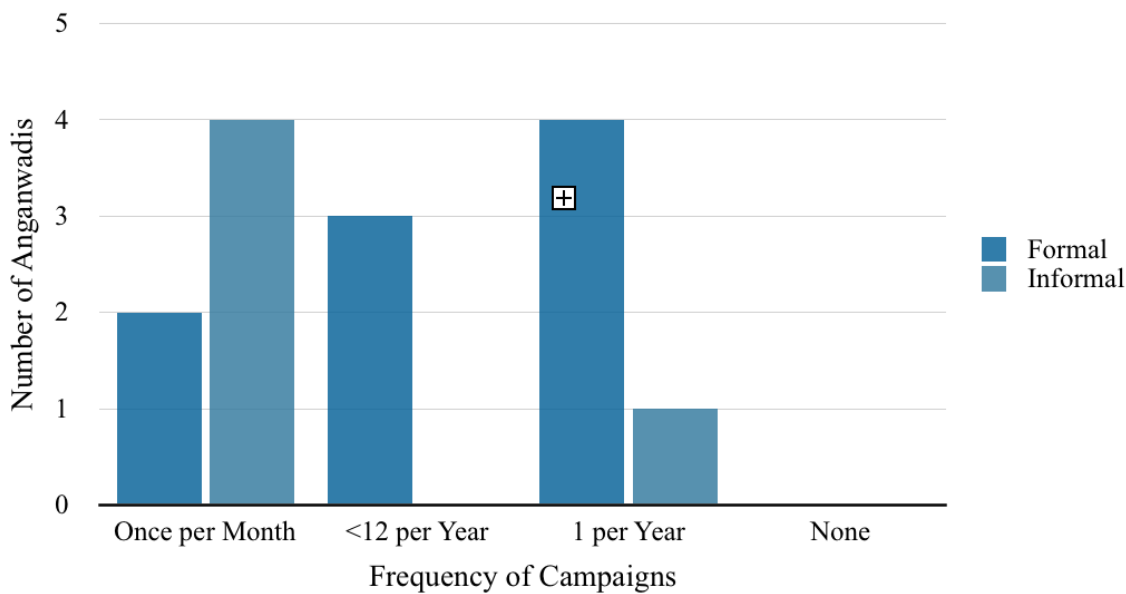


Figure 4: Frequency of Health/Nutrition Related Anganwadi Campaigns

Although all of the surveyed Anganwadis are conducting some sort of health and nutrition campaign each year, 85.7% of the Anganwadi teachers believe their programs have not changed the health and eating habits of the program beneficiaries. Because most of the food provided is already part of the daily diets of the tribal villagers, the diets themselves do not change much; however, the beneficiaries are receiving additional calories and protein to supplement their original dietary intakes. As previously noted, it is observed that programs are more effective at influencing the health and dietary behaviors of children, who are under the supervision of AWWs during the day, rather than pregnant and lactating women.

Even though AWWs are expected to develop nutrition and health campaigns, 66.6% of AWWs felt that they were not adequately trained for their roles and 8.33% of AWWs received no formal training of any kind. This gap in education is possible explanation as to why the current nutritional campaigns are not altering the long-term eating and health habits of Anganwadi beneficiaries.

4.2 The Influence of Social and Cultural Norms on Eating Behavior

Nutritional Status Across Social Groups (2013)				
Category	SC	ST	BC	OC
Stunting	39.0	32.2	34.4	24.1

Figure 5 Source: Center for Economic and Social Studies and Government of Telangana Planning Dept., 2017

As shown in Figure 5, the scheduled castes, scheduled tribes, and backward castes suffer from the highest rates of stunting, as of 2017. All villages analyzed in this case study are members of a ST, SC, or BC. Cultural practices in STs, such as child marriages (under the age of 18), result in higher probabilities of malnourishment because of lack of pre-natal care and poor socioeconomic

status. With poor socioeconomic standing, children are not adequately receiving adequate food and dietary diversity (Center for Economic and Social Studies and Government of Telangana Planning Dept., 2017).

Not only do cultural and social values vary by tribe, but by village as well. Although there are cultural similarities in tribal villages of the same mandal, such cultural values impact village food choice in differing ways. For example, the Gond dominated village surveyed, during fasting days, will consume tea and fruits on availability, while the Nethakani dominated community will consume milk and fruit.

4.2.1 Tribes and Castes

In the both the pregnant and lactating, and adolescent girl FGDs, Gonds represented the greatest number of participants. Although the pregnant and lactating groups have a significant number of Nethakani and Madiga, Gonds remain the largest group in the study. Similarly, in the adolescent girls FGD, an overwhelming number of the girls were Gond. Because the Gond is a scheduled tribe that relies heavily on labor for economic viability, the overall literacy rate among the tribe is low at 50.39% (Government of Gujarat). *Figure 6* shows that almost half of the girls are illiterate, while the other half received some level of schooling. Despite the fact that more than half of the participating adolescent girls received some form of schooling, no members of either focus group knew the meaning of “nutrition.” When asked to describe healthy foods and explain their reasoning, the girls based their food choices on misnomers. Common responses were that milk, fish, okra, and tomato are good for blood, while ambali reduces body heat and controls body temperature during the summer.

4.2.2 Social and Cultural Eating Practices

Regarding intra-household food allocation, the surveyed tribal villages of Tiryani follow a combination of the functional and cultural models. In both the pregnant and lactating, and adolescent girl focus groups, all respondents stated that the father of the household ate first, while the mother would eat last. When probed as to why the household members ate in this order, the respondents stated that because the fathers are the first household members to go to the field in the morning, they deserve to eat first. As the functional model states, resources are allocated to foster productivity. Similar to a function-driven society, in times of food abundance, the respondents in Gond villages stated that generally all members of the household received equal shares of food. Contrastingly, the respondents from the Nethakani/Madiga-dominated village surveyed stated that the mother would eat the leftovers after all other members of the household have finished eating.

Applying the cultural lens, respondents also stated that because the father is the head of the household, allowing him to eat first is a sign of respect. The respondents did not give a clear explanation as to why the women ate last.

In both villages; however, there is little understanding that pregnant and lactating women require supplementary nutrition. For example, in the pregnant and lactating focus groups, the participants shared that special foods were not provided for pregnant and lactating women and

the only food restrictions stated was papaya in the Nethankai/Madiga village, and there were no stated dietary restrictions in the Gond village.

In regards to whom purchases the food in the household, the pregnant and lactating women all stated that they decided what was cooked in the house. It should be noted that none of the respondents had received higher than an intermediate education and had only a limited knowledge of what they perceived as “healthy foods.”

5. Conclusion and Path Forward

The drivers of dietary diversity among tribal populations differ based on the study population. For example, when determining the influence of government campaigns on the dietary pattern of this study population, it was observed that villagers expect Anganwadis to provide supplementary nutrition for their children and readily take advantages of such services if the Anganwadi is easily accessible. This statement does not hold true for pregnant and lactating mothers; even when Anganwadis were located in the village they were serving, AWWs had to contact the pregnant and lactating mothers to take the food. Even when distributed, it is unknown to the AWW whether the pregnant or lactating woman in the household is consuming the food. Despite the Anganwadi’s ability to provide at least one meal a day to children, the Anganwadi is not guaranteed to diversify the child’s diet. This case study showed that although the government provided ingredients such as rice and dal, nutrient-rich vegetables were only provided to the children on availability. It was the responsibility of the AWW to buy the vegetables.

Further study needs to be conducted in the tribal villages of various districts of Telangana to identify consistent inefficiencies in the ICDS scheme. Even in the same mandal, cultural values and beliefs vary from village to village. As aforementioned, in Tiryani, one group of pregnant and lactating women believed that they could consume anything during pregnancy and lactation periods, while the other village believed that they could not consume mangos. Such disparities show that nutritional literacy is still almost nonexistent in the tribal villages, but it also shows that the nutritional fallacies also differ based on village and tribe.

To further explore these differences and identify how the ICDS scheme can become more effective in promoting health and nutrition campaigns, studies have to identify which tribes are more likely to reject or ignore the advice of AWWs and ASHAs. Research should be conducted on the impact of Anganwadis oversight on health outcomes in the villages. In the study villages, despite having majority of Anganwadis conduct annual health campaigns, most AWWs believed their campaigns have little to no impact on the nutritional behavior of villagers.

Because cultural norms vary by geographic region, additional surveys should be conducted in other mandals of the Adilabad district. This case study surveyed Tiryani, an interior mandal, and Utnoor, a mandal that is more easily accessible. The additional studies would determine whether relative isolation of the tribe has any impact on the villages’ nutritional literacy.

In conclusion, government programs have had minimal effects on the dietary diversity of pregnant and lactating women, children, and adolescent girls because of inefficiencies in program implementation. And although cultural practices drive eating aspects of behavior in

tribal populations, overarching social elements, such as low literacy rates, have a greater impact on the village population's perceptions of diet and basic nutrition.

Experience



Work Cited

- Nourishing India's Tribal Children* (Publication). (2014). New Delhi: UNICEF.
- Ministry of Women and Child Development, Government of India. (2009). Retrieved July 14, 2017, from <http://icds-wcd.nic.in/icds/icds.aspx>
- Tribal Training and Research Institute, Tribal Development Department, Government of Gujarat. (n.d.). Retrieved July 14, 2017, from <https://trti.gujarat.gov.in/gond>
- Delivering Essential Nutrition Interventions in Women in Tribal Pockets of India*(Publication). (2017). New Delhi: UNICEF.
- Raykar N., Majumder M., Laxminarayan R., Menon P. 2015. *India Health Report: Nutrition 2015*. New Delhi, India: Public Health Foundation of India
- Performance Evaluation of Targeted Public Distribution System (TPDS)*(Rep.). (2005). New Delhi, India: Programme Evaluation Organisation, Planning Commission, Government of India.
- Ramaswami, B. (n.d.). *Food Security and the State* [Review]. Retrieved July 14, 2017.
- India, Planning Commission . (2010). *Addressing India's Nutrition Challenges*. New Delhi, India.
- Rao, V. G., Yadav, R., Dolla, C. K., Kumar, S., Bhondeley, M. K., & Ukey, M. (n.d.). *Undernutrition & childhood morbidities among tribal preschool children* (pp. 43-47, Rep.). Jaipur, India: Regional Medical Research Centre for Tribals (ICMR).
- Mandals and Villages. (n.d.). Retrieved July 14, 2017, from <http://adilabad.telangana.gov.in/mandals-villages/>
- India , Ministry of Health and Family Welfare. (n.d.). *District Fact Sheet Adilabad (2012-13) (District Level Household and Facility survey -4)*. Mumbai, India: International Institute for Population Sciences.
- India, Census Organization of India. (n.d.). *Tiryani Mandal- Adilabad (Census Population)*.
- Bentley, M E; Griffiths, P L. *European Journal of Clinical Nutrition*; London 57.1 (Jan 2003): 52-60.
- India, Ministry of Pachayati Raj. (2009). *A Note on the Background Regions Grant Fund Programme*. Retrieved July 15, 2017.
- Alim, F., & Jahan, F. (2012). *Assessment of Nutritional Status of Rural Anganwadi Children of Aligarh under the ICDS (Integrated Child Development Services) and Rural Health* (Rep.). Aligarh, Uttar Pradesh, India: Kamla-Raj.
- Manhas, S., & Dogra, A. (2012). *Awareness among Anganwadi Workers and the Prospect of Child Health and Nutrition: A Study in Integrated Child Development Services (ICDS) Jammu, Jammu and Kashmir, India* (Rep.). Jammu , Jammu and Kashmir, India: Kamla-Raj.
- S., W. T. (1990). *Village and Household Economics in Indias Semi Arid Tropics*. Baltimore, MD: The John Hopkins University Press.
- From Promise to Impact: Ending Malnutrition by 2030* (Global Nutrition Report, Publication). (2016). UNICEF.