

Investigating the ICDS Nutritional Scheme on a Micro-Level: Insights on Aurepalle

**Report Submitted to
International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)**

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Abstract

Title: Investigating the ICDS Nutritional Scheme on a Micro-Level: Insights on Aurepalle

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Abstract:

Hunger is universal. It touches the lives of those ranging from Harare to Hanover, Niambi to New York, and Mumbai to Manchester. Hunger is not to be reserved for the third world, homeless shelters, or any country that currently faces a hunger crisis. Dr. Norman Borlaug profoundly stated that "Food is a moral right." His wise words echo through my mind every time I think about the millions of souls this epidemic has touched. In every point in human history there has been hunger. It exists in every country, city, and province and it extends past the barriers of race, gender, and age. Hunger is real.

The aim of this study was to determine whether or not the ICDS nutritional scheme is beneficial towards childhood growth on a micro-level. Through the quantitative analysis of the anthropometric data, and the qualitative analysis of the questionnaires and focus group discussions, this study presents ground level insights on the ICDS nutritional implementation, gender roles, and prevalent nutritional trends in Aurepalle. The results found suggest that the ICDS nutritional scheme is beneficial towards childhood growth in Aurepalle, but only to those who actively participate in the program. Nutritional awareness hindered the nutritional development of many children as their parents do not understand what nutrition is.



1.1 Introduction:

According to the FAO 2013 World Fact Book, from 2005 to 2011, 44% of India's children aged 0-5 were undernourished. This percentage has only dropped slightly from 1990-1995 where 50% of India's children were undernourished. In cereal, rice, wheat, pulse, root and tuber, vegetable, and jute production, India was ranked as one of the top 3 producers *in the world* (Food and Agriculture Organization of the United Nations, 2013). Why is India in the highest range for food production in the world (along countries like the United States, China, and Brazil), but almost 50% of its children are undernourished (the highest range for malnutrition per country given by the FAO)? This was the question that I yearned to solve, and a solution to a problem that is simultaneously devastating and baffling, but unfortunately my internship did not grant me a lifetime in India to do so. This question was the driving force behind my research.

Chart 1.1

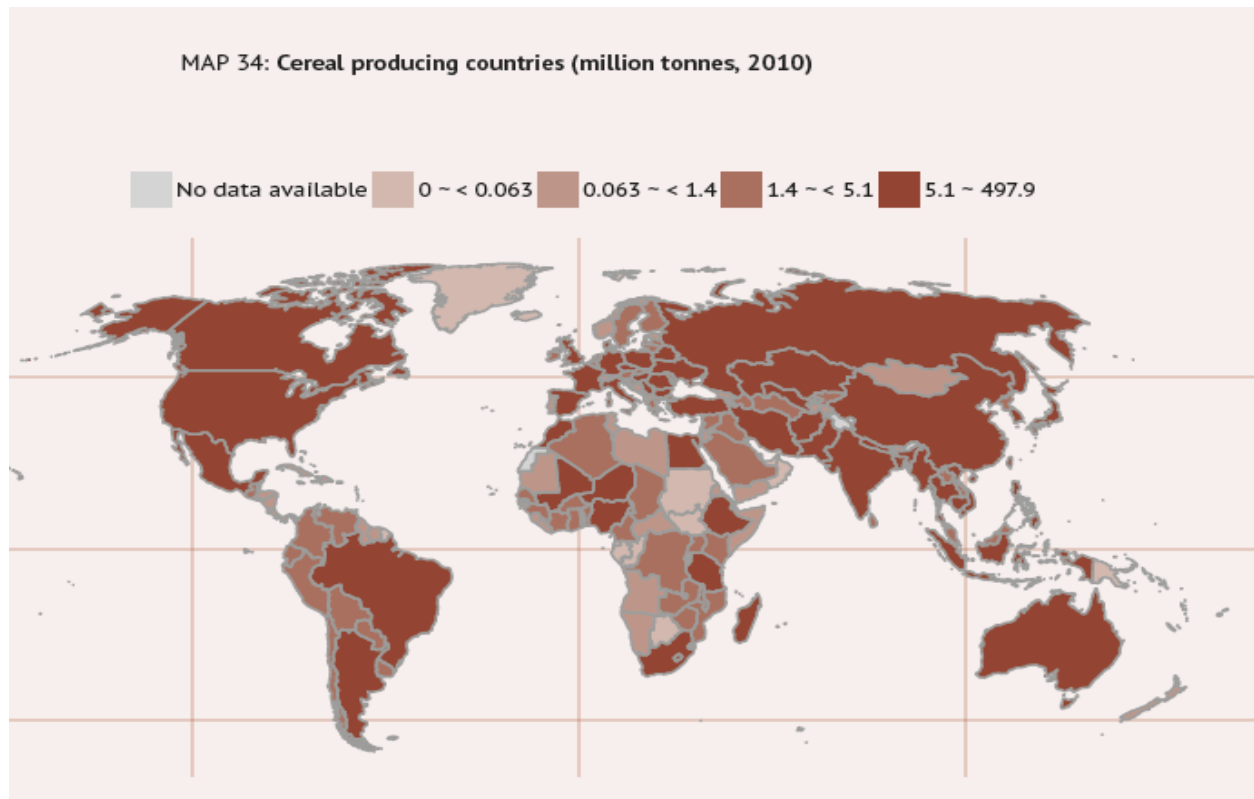


Chart 1.1 derived from the 2013 FAO World Fact Book shows India as one of the top cereal producing nations in the world.

Chart 1.2

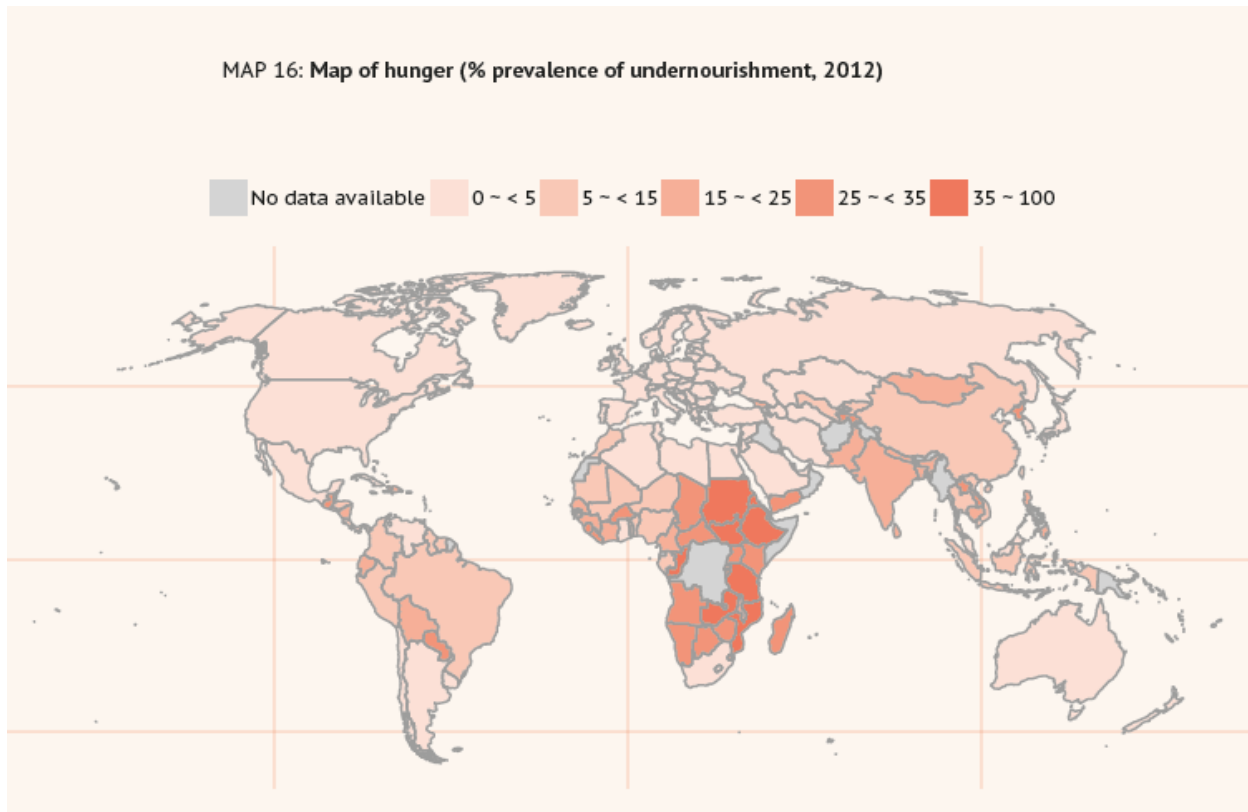


Chart 1.2 is in stark contrast with **chart 1.1**, where India is portrayed with having a relatively high undernourishment rate.

1.2 Introduction:

ICRISAT



Founded in 1972, The International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) is a non-profit and non-political organization whose mission is “To reduce poverty, hunger, malnutrition and environmental degradation in the dryland tropics” (ICRISAT, n.d.). The Semi-Arid Tropics (SAT) is a region that has been struck by harsh environmental plagues, high variance in rainfall activity, and poor soil quality which has greatly affected its agricultural yield. The SAT region is also home to over 2 billion people (644 million of them regarded as the poorest in the world) spanned over 55 countries. ICRSIAT works to empower these individuals through improved agricultural practices that promote sustainable enterprise.

ICRISAT conducts its research through four research programs:

1. **“Resilient Dryland Systems** – Reducing vulnerability to drought and climate change while increasing crop diversity and value.
2. **Markets, Institutions and Policies** – Harnessing development pathways for inclusive prosperity.
3. **Grain Legumes** – Raising and securing legume productivity for health, income and sustainability.

4. **Dryland Cereals** – Increasing dryland cereal crop productivity to help end hunger.”
(ICRISAT, n.d.)

The International Crops Research Institute for the Semi-Arid Tropics has its headquarters currently located in Patancheru, Andhra Pradesh India, and has many branches located within sub-Saharan Africa. ICRISAT is one of fifteen members of the Consultative Group on International Agricultural Research (CGIAR) Consortium.

I had the privilege of working in the Markets, Institutions and Policies (MIP) department, headed by Dr. MCS Bantilan. As stated in the MIP Leader’s Note for harnessing development pathways for inclusive prosperity, the department’s objective is “To ensure that market-oriented development is inclusive, ie, to capture as much of the value in the chain as possible for the poorest households, and for women in particular.” (Bantilan, n.d.) Right now the MIP department’s research projects are focused on these four areas:

1. “Strategic assessments
2. Rural livelihoods and development pathways
3. Markets, situation outlooks and institutional innovation
4. Impact assessment and research priority setting” (ICRISAT, n.d.)

ICRISAT’s Village Level Studies was initiated in 1975 by the Economics program in 6 villages spread across Andhra Pradesh (Aurepalle and Dokur of the Mahbubnagar district) and Maharashtra (Shirapur and Kalman under Solapur district, and Kanzara and Kinkhed under Akola district). It was later extended to two villages in Gujarat in 1980 and two villages in Madhya Pradesh in 1981 in India. In the early 1980s, the VLS was initiated in six villages of Burkina Faso and four villages in Niger (ICRISAT, n.d.). “VLS provided a landmark database on rural households in the semi-arid tropics (SAT) of India and West Africa. Scholars and development practitioners worldwide have used this database to analyze the processes of decision-making and technological change in agriculture. These data have also formed the basis of numerous journal articles, research reports and dissertations, giving us a better understanding of rural labor, financial markets, risk attitudes and technological change. These studies, in turn, have helped design new technologies and policy changes.” (Rao, 2003)

1.3 Introduction:

Aurepalle Village Profile

Aurepalle is a village located in the Mahbubnagar district of Andhra Pradesh, and is one of the 6 original VLS villages. Before outbreaks of cholera and plague (which killed around 10% of the village population) the village was called Raskulpet. After this outbreak the people migrated to a new area about 1.5 kilometers west to escape these outbreaks. This is why the name “Aurepalle” means another village (from the Urdu word “aour” meaning “another” and the Telugu word “palle” meaning “village”). The nearest town, Amangal, is located 10 kilometers away, and the most common forms of transportation from Aurepalle to Amangal is either by bus or auto-rickshaw (although not every family owns one).

The five represented caste groups in Aurepalle are:

- Forward Caste (FC)
- Backward Caste (BC)
- Scheduled Caste (SC)
- Scheduled Tribe (ST)
- Minorities

Agriculture is the most common occupation as over 50% of the villagers are farmers. In 1945, with a single teacher, an elementary school was established in the village. Now there are three Anganwadi Centers, three primary schools with 214 children enrolled, two secondary schools with 100 children enrolled, and one high school with an enrolment of 192 children (schools are run privately and by the government), and an adult education program for ages 18-35 (only partially functioning). “The literacy rates have significantly increased to 90 percent in males and 70 percent in females, in the age group of 5-30 years” (Ramana, Mohan, Kiresur, & Bantilan, 2011).

The Hindu religion is largest religious group in the village. They meet in their homes for worship where “They sing *bhajans* and listen to *slokas* under the guidance of a priest who performs

pooja. There are four temples, of which one was constructed a long time ago in the center of the village—the Hindus perform pooja and bhajans here on Saturday nights and festivals.” (Ramana, Mohan, Kiresur, & Bantilan, 2011)



2.1 Background:

Integrated Child Development Services

The Integrated Child Development Services (ICDS) scheme was launched on October 2, 1975. Before its initiation, ICDS officials visited each location and told the people about the program, what they intend to offer, and how it will be implemented in their area. The ICDS now delivers services to 8.6 million mothers and 39.35 million children in India (Thakur, Bhatia, & Prinja, 2010). This initiative is known as one of the largest pre-primary school programs in the world. Its mission is to break the cycles of malnutrition, morbidity, reduced learning capacity, and mortality while also providing a pre-primary school education. The Anganwadi (literally meaning courtyard) is a childcare center that is located in the village or slum area. It is the place where supplementary meals are given and play-way methods of education are conducted. The center also serves as a meeting ground for women and mother's groups to come together. The Anganwadi Centers have quickly become the hub of each village or slum.

Objectives: The ICDS scheme was launched with the following objectives

- ❖ “To improve the nutritional health status of children aged 0-6 years
- ❖ To lay the foundation for proper psychological, physical, and social development of the child
- ❖ To reduce the incidence of mortality, morbidity, malnutrition, and school dropout
- ❖ To achieve effective co-ordination of policy and implementation amongst the various departments to promote child development
- ❖ To enhance the capability of the mother to look after the normal health and nutritional needs of the child through proper nutrition and health education.

Services: The above objectives are sought to be achieved through a package of services comprising:

- ❖ Supplementary nutrition
- ❖ Immunization
- ❖ Health check-up
- ❖ Referral services
- ❖ Pre-school non-formal education
- ❖ Nutrition and health education.” (Department of Women and Child Development, n.d.)

The nutritional selection given by the ICDS centers varies by state government. The Andhra Pradesh ICDS nutritional scheme is mostly comprised of these four foods: Kichidi (given to children 3 years to 6 years at the center), Halwa (given to children 3 years to 6 years and pregnant and lactating women as part of the take home ration), Modified Therapeutic Food (MTF is given to children 6 months to 3 years as part of the take home ration), and Kukure (this snack food is given to all beneficiaries of the ICDS scheme). Eggs are given twice a month, and rice and dal were recently added as take home ration to encourage more parents to want to send their children to the centers. The nutritional information of Kichidi, Halwa, Modified Therapeutic Food, and Kukure are included in the appendix.

The chart below from the Department of Women and Child Development depicts the services, target group, and providers of ICDS scheme.

Chart 1.3

Services	Target Group	Service Provided by
Supplementary Nutrition	Children below 6 years Pregnant & Lactating Mothers (P&LM)	Anganwadi Worker(AWW) and Anganwadi Helper (AWH)
Immunization*	Children below 6 years Pregnant & Lactating Mother (P&LM)	Auxiliary Nurse Midwife (ANM)
Health Check-up*	Children below 6 years Pregnant & Lactating Mother (P&LM)	ANM/AWW
Referral Services	Children below 6 years Pregnant & Lactating Mother (P&LM)	AWW/ ANM
Pre-School Education	Children 3-6 years	AWW
Nutrition & Health Education	Women (15-45 years)	AWW/ANM

The ICDS is a major key in the universalization of pre-primary school programs by providing necessary preparation for primary schooling to younger children. It thus frees the older children – especially the girls – to attend school.

The ICDS team is comprised of an Anganwadi Worker (AWW), a woman selected from the local community, who is an honorary worker. She works to provide better care and education for the community's children, women aged 15-45, as well as pregnant and lactating women. Her main task is to teach the pre-primary school participants, provide ICDS recipients with basic health education and treatment, and to assist them to connect to public hospitals. The Anganwadi Worker is also supplied with a helper whose main job is to assist the AWW in any way possible. Besides the medical officers, there is an Auxiliary Nurse Midwife (ANM) and an Accredited Social Health Activist (ASHA) who forms a team with the ICDS workers to make sure every service runs seamlessly throughout the community. Since the AWW and AWH are honorary workers they are paid a monthly honoraria decided by the Government.

The remaining segment of this section encompasses my review of ICDS literature pertaining to nutrition.



Nutrition

It is a known fact that 80% brain growth takes place in the first six years of one's life.¹ A study on exploring gap analysis of ICDS centers in Bangalore states that the quality of food provided at many Anganwadi Centers is not enough to "improve the nutritional and health status of children," as the scheme envisioned (Child Rights And You).¹ The results of Yatsu's (2012) study shows a positive association with those who received the complimentary nutrition and infant survival rate.

Nutritional Implementation

"The 3 major ICDS implementation problems are:

1. Lack of valid training and management of AWWs
2. Undeveloped resource supply mechanism
3. Poor targeting strategy of the food supplementation service" (Yatsu, 2012)

Gragnolati, Bredenkamp, Das Gupta, Lee, and Shekar (2006) researched the association between India's infant malnutrition rate and ICDS performance. They found that beneficiaries tend to utilize only immunization and nutritional services while local AWCs provide a broader range of 6 services. Lokshin, Das Gupta, & Ivaschenko (2005) State that the AWC services are more likely to reach children ages 3-6 than newborns. If beneficiaries chose to use all 6 offered services, the positive outcome of the ICDS would be greatly maximized. Thakur, Prinja, and Bhatia's study (2010) suggests that the Indian government would be more likely to improve its infant survival rate by further developing the adult education program under the ICDS framework. These authors state that the ICDS program is not associated with better nutritional outcomes due to improper utilization and implementation.

¹ "Need Gap Analysis in Anganwadis" is a Survey Report of Conditions at Anganwadis in Bangalore. There is no date to which this publication was published, and it was completed by a group of 15 research students.

2.2 Literature Review

Nutrition

In developed countries, cereals are usually considered low sources of dietary iron, but in Maharashtra and Andhra Pradesh, households consume such large volumes of cereals (and small quantities of iron-rich foods) that cereals become the greatest contributor of iron. Foods that are known to be iron-rich (like green leafy vegetables) account for an insignificant percentage of dietary iron intake because of their lack of prevalence in the village. Chung found that these green-leafy vegetables were more expensive in Andhra Pradesh than in Maharashtra. This find explained why there was less consumption of these vegetables in Andhra Pradesh (Chung, 1998).

Nutritional Health Related to Income

Nutritional health varies in different villages. Sanitation, public health initiative, income level, and village infrastructure play a major part in this (Walker & Ryan, 1990). Yatsu (2012) suggests that running water and indoor toilets more accurately reflects a household's economic status than its level of income. Walker and Ryan (1990) found that in villages malnourishment is more prevalent in bigger families than smaller ones. Chung (1998) found that households tend to increase the quality and quantity of food staples as income rises. In Andhra Pradesh energy, iron, protein, and niacin are unrelated to income, but vitamin C, fat, and calcium adequacies tend to rise with income level (Chung, 1998, p. 10). Walker and Ryan (1990) found that women who worked had a larger role in household decisions and food allocation. Because of this, women's labor earnings had a higher chance to be turned into better food for their children. Although families in these villages will purchase better quality food, it is simply because the food tastes better, not necessarily because it allows for better nutritional health (Walker & Ryan, 1990, p. 286).

Malnutrition

Lack of clean water, sanitation, and immunizations negatively affect child health in India. Malnutrition rate tends to be indirectly related with socioeconomic status. “Despite major strides for better in per-capita income of Chandigarh (increased from Rs. 19,761 in 1994 to Rs. 60,105 in 2004), malnutrition continues to remain a public health problem, with half of the Indian children being underweight” (Thakur, Bhatia, & Prinja, 2010). This finding is significant in light of increasing urbanization, rising urban slum population, and slow progress in health services provision (Thakur, Bhatia, & Prinja, 2010). “Despite overall improvements in the nutritional status of children, the gender difference in malnutrition continues to remain important and it is more pronounced among disadvantaged social groups such as Scheduled Castes and Scheduled Tribes” (Sood, 2010).

Malnutrition and Education

According to Sood (2010), there is evidence that shows that malnutrition in early childhood is closely linked to deficits in a child’s cognitive development. Stunting delays school enrollment and has been linked to grade repetition and primary school dropout. Children who suffered from malnutrition also suffered behavioral issues. “Deficiency of micronutrients such as iron, iodine and zinc is associated with a lower attention span, poor memory, mental retardation and poor school achievement.” (Sood, 2010)

Nutritional Education

There is poor understanding on the nutritional aspects of early childhood all across India. Not many are familiar with the scientific facts or understand the importance of nutrition during the early childhood stage for a healthy development. This has led to indifference and neglect on the part of the government which has led to indifference and neglect on the part of community involvement. Community participation is an important element in the design of ICDS (Child Rights And You). Bajpai and Dholakia (2011) argue that India requires nutritional leadership at national, state, district, and community levels. “We recommend that states reinforce this commitment to nutrition by creating inter-ministerial councils to emphasize political will towards state nutrition policy and planning” (Bajpai & Dholakia, 2011).

2.3 Limitations of the Study:

Time has been the greatest limitation of this study. I was only able to conduct research in the village of Aurepalle, but had more time been permitted, I would have compared more villages in Andhra Pradesh to assess whether the conclusions drawn from this study were applicable to other ICDS centers. Comparing more villages would have provided a much greater sample size of ICDS anthropometric data for analysis, and more qualitative data could have been gathered from ICDS beneficiaries as well as focus group discussions containing more non-ICDS participants. This would have contributed greatly towards a more well-rounded study.

Many families in Aurepalle have migrated to Hyderabad for more work, leaving incomplete ICDS anthropometric data for analysis. Had more villages been compared, a more accurate comparison of the scheme would have been possible.

In addition, had more time been permitted, I would have broadened the overall objective of the study to include a more in-depth analysis of how child participants of the ICDS have progressed 5 years after they finished the program compared to their peers who were never a part of the ICDS scheme. This would attest to whether or not the ICDS scheme provides long term benefits to those who participate, rather than just the short term nutritional supplementation.

3.1 Research Objective:

The objective of the study was to determine whether the ICDS nutritional scheme is beneficial towards lessening childhood malnutrition on a micro-level.

3.2 Research Question:

Based on my research objective, my main research question was formed. **“Is the ICDS nutritional scheme beneficial towards lessening childhood malnutrition (ages 0-5) in Aurepalle?”** From this question, smaller sub-questions were asked to provide a more comprehensive analysis. These questions were later broken up to be analyzed quantitatively and qualitatively.

1. Which gender is more malnourished?
2. How have each gender’s nutritional growth progressed overtime?
3. Do men and women place the same level of importance regarding the ICDS nutritional scheme?
4. Do the Anganwadi Worker and Helper find the ICDS nutritional scheme to be beneficial towards childhood growth?

3.3 Research Hypothesis:

From my main research question, a hypothesis was formulated. The main hypothesis is: **The ICDS nutritional scheme is beneficial towards lessening childhood malnutrition in Aurepalle.** The hypotheses listed below were formulated to correspond with the sub-research questions asked above.

1. Girls are more malnourished than boys.
2. Both gender’s nutritional growth started out very poor and malnourished, but ended very strong and healthy.
3. Men and women do not place the same level of importance regarding the ICDS nutritional scheme.
4. The Anganwadi Workers and Helpers find the ICDS nutritional scheme to be beneficial towards childhood growth.

3.4 Methodology:

Quantitative Analysis

First I inputted the weight for age data of the ICDS child participants into excel (by increments of 1 month until 36 months, and after 36 months the increment changed to every 3 months until a total 60 months was reached.) After this data was tabulated, I broke it up by gender and the AWC the child belonged to (for example I had Center 1 male, Center 2 male, Center 3 male ect.). I took the averages of the weight measurements by month, and examined each center's data for trends. After doing so, I took each monthly average per center and compared them with the other two centers. This was to identify which center had the highest performing children in the village. After comparing center by center, I compounded the averages of boys and girls at each center and compared them respectively with the WHO weight for age averages. I then compared the ICDS averages by year with the VLS anthropometric measurements of children aged 0-6 in Andhra Pradesh.

Qualitative Analysis



I made two questionnaires (one for the mother of the ICDS child participant and another for the AWW and AWH) and two near- identical focus group guides (one for female non-ICDS and ICDS participants and another for male ICDS spouses and fathers) the questionnaires and focus group guides can be found in the appendix.

Once in Aurepalle, 8 ICDS participants were randomly selected and interviewed and all 6 of the Anganwadi Workers and Helpers at the three centers were interviewed. There was a total of 15 women (10 ICDS participants and 5 non-ICDS participants) present the focus group discussion, and there was a total of 6 male ICDS spouses and fathers who were present at the focus group discussion. Their answers were given to me by my translator and village guide Mr. Siddappa.

After returning to ICRISAT, the questionnaire responses were inputted into excel, and the focus group discussions were logged into Microsoft word. For the women questionnaire, I analyzed the responses given for each question to look for any prevalent trends. Then I cross analyzed the responses given on questions that depicted the differences in opinion of ICDS centers between women and their husbands.

For the Anganwadi Worker and Helper questionnaire I analyzed their responses to look for prevalent trends in how they viewed the ICDS nutritional scheme, what they offered in each center compared to what the government regulated to be offered at each center, and the regularity in teacher and student attendance to centers. The ratings of each center's amenities were averaged and compared.

After the focus group discussions were inputted into word, the male and female answers were compared to determine the differences in the priorities of each gender.



4.1 Results:

4.2 Quantitative Trends

Center 2 lagged behind in their data averages for both girls and boys. Eventually it would catch up and maintain the lead for averages in the middle (boys: 25-45 months, girls: 21-54 months), but then its averages would plummet towards the end. Centers 1 and 3 alternated for highest performing males and females throughout.

Boys Data:

I found that in all 3 centers, the male data started out completely full. Center 1 started decreasing in participants at 33 months, center 2 started decreasing in participants at 51 months, and center 3 started decreasing in participants at 23 months. Each center's chart had less than 30% of its original participants by the 5 year mark. This shows that children are avidly participating in the ICDS scheme during the early stages of development, but drop out before they are completely finished with the program. I further examined the weight measurements of the children who completed the program and found that even if they showed signs of malnourishment towards the beginning and middle stages, by the last 6 months of the ICDS scheme they are all in the highest weight for age category.

Girls Data:

The data from centers 2 and 3 shows that they had all of their participants from the beginning. Center 1 only started to fill out its participant data from 12-28 months. After 28 months the first center's data drops rapidly and a total of 17% of original participants finished their 5 years at the center. In center 2, data starts thinning out at 54 months, and center three's data starts decreasing at 35 months. Center 2 had 34% of participants who finished all 5 years of data, and center 3 had 20% of participants who finished all 5 years of data. Females had a similar trend depicted in the male data whereby in the last 6 months of the ICDS scheme, all lasting participant's data skyrocketed or maintained a healthy climb. They all ended their 5 years of participation in the highest weight for age category.

4.3 Qualitative Trends

ICDS Participant Questionnaire:



Men and women had different priorities when it came to ICDS enrollment. Each questionnaire respondent was asked to list the reasons why they chose to send their children to the ICDS and why their husbands chose to send their children to the ICDS. In order of importance, men valued education, child interaction, nutrition, and day care whereas women valued daycare, child interaction, nutrition, and education provided by the ICDS. Social and cultural norms between men and women come into play when further investigating this find. The majority of the men had a higher level of education than their wives. The men most likely view education as a valuable asset for their child's growth. Whereas, a woman's main job is to look after the children. From her perspective, having a place for the children to be looked after while she can go and earn an income is invaluable compared to any other ICDS service.

Chart 4.1

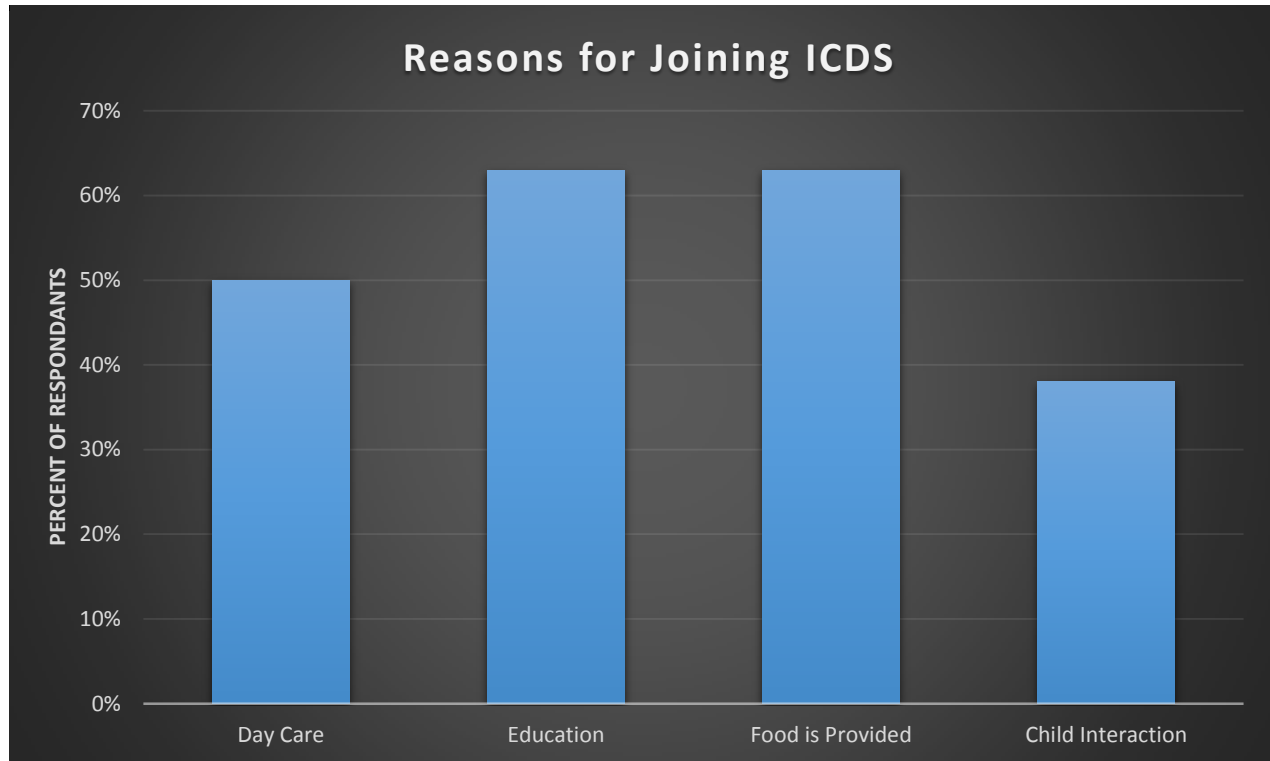


Chart 4.1 shows the reasons provided by female respondents when asked why they joined the ICDS.

Another prevalent trend is the progression of the literacy rate in one generation. The questionnaire respondents were asked to list the education their education level as well as the education levels of their mother, father, and husband. Once their answers were tabulated and averaged they were analyzed to determine the literacy rate progression in one generation.

Chart 4.2

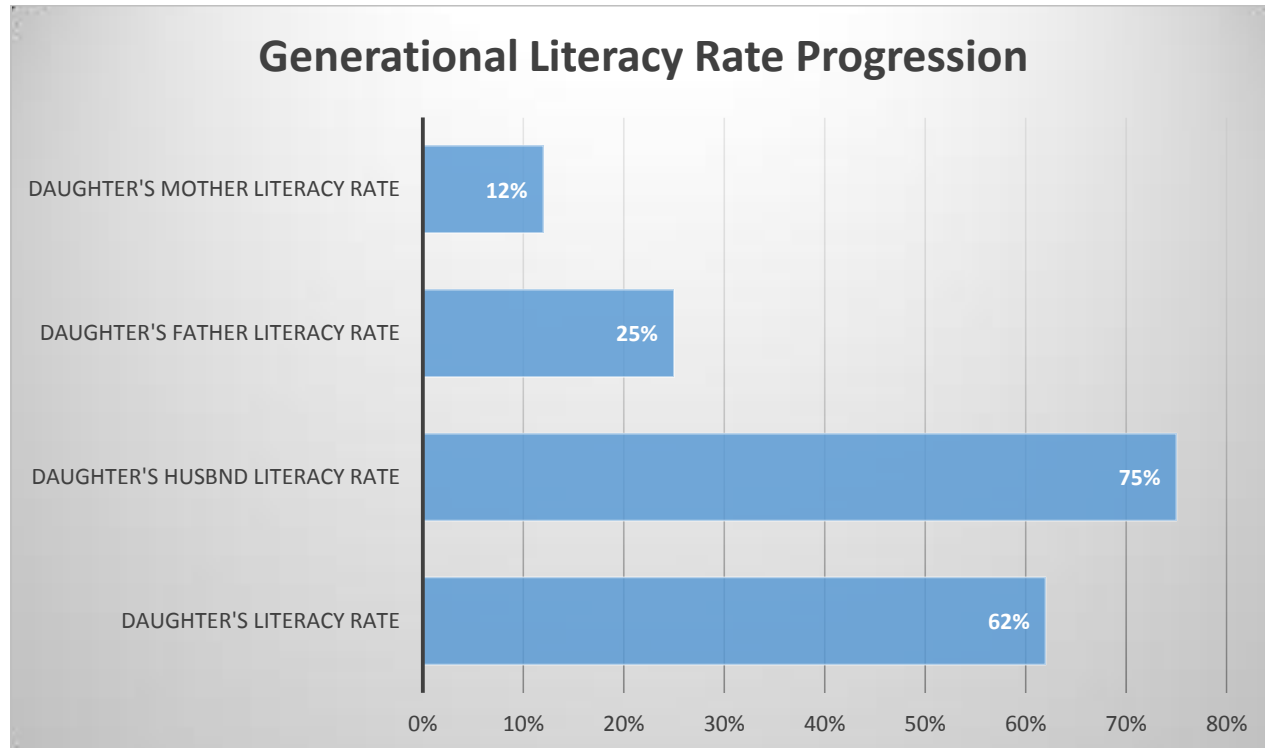


Chart 4.2 shows how drastically the average literacy rate has progressed in one generation. This builds hope that the next generation (comprised of those who were interviewed and *their* children) will be one step closer to a fully literate community in Aurepalle.

Anganwadi Worker and Helper Questionnaire:

All teachers stated that they attended the centers regularly and on time because it is their duty to the children and to the village, and if they didn't show then the children would stop coming all together. They all agreed that the quality of food given at the centers is good, and the main problem that they face is a lack of children who attend. They all stated that the program is the most beneficial to the nutritional health of children who attend the center regularly. This shows that the main issue with the nutritional implementation of the program stems from parents not actively participating in the program. Further investigation of the developing qualitative trends are found in the focus group discussions.

Male vs. Female Focus Group Discussions:



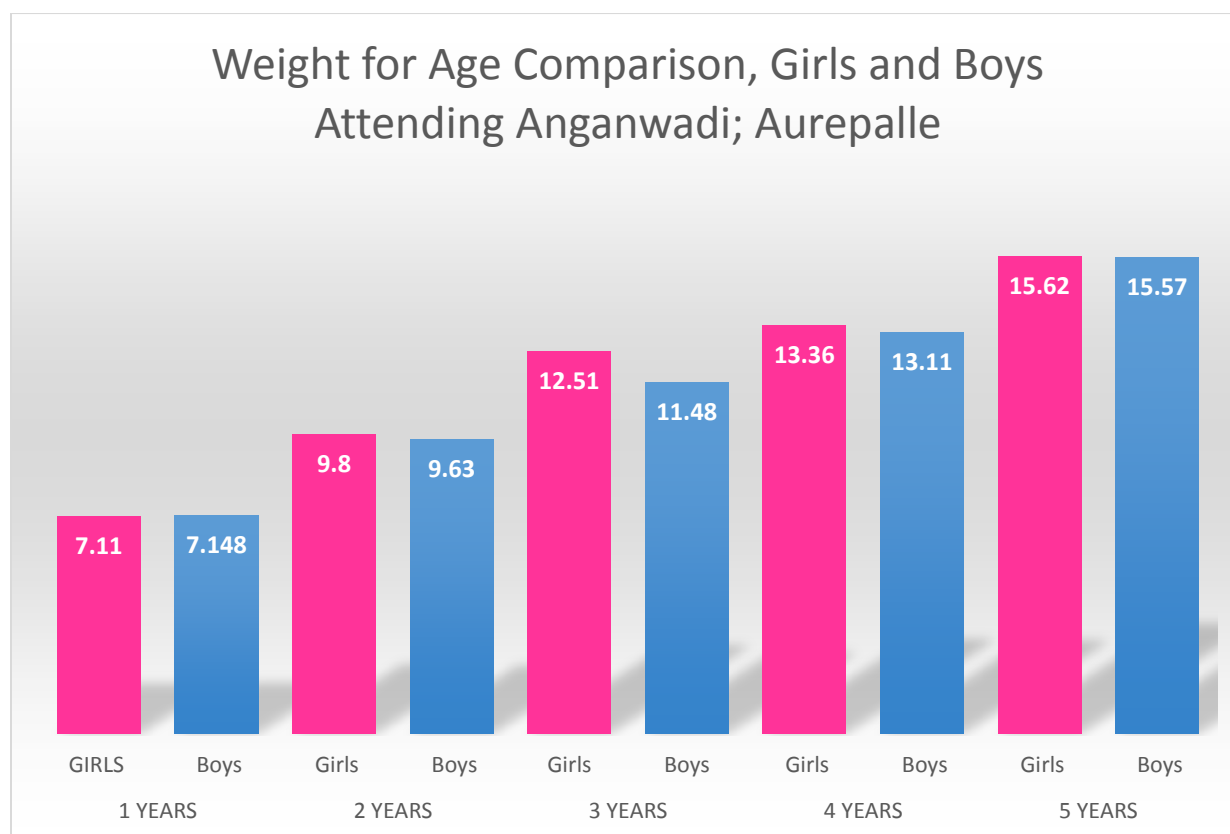
The male and female respondents agreed that the timings of the Anganwadi centers (center 1 open from 8:30-1:30, center 2 open from 9-12:30, and center 3 open from 9:30-12:30) made the ICDS an unconventional place to send their children. Because both have jobs, no one is able to take care of the children whereas the village private school is open from 8-5 pm. Both genders suggested that the center's hours need to be increased in order for more parents to send their children to the ICDS. This is a major implementation flaw that each center needs to address. Both genders also noted that the Anganwadi Helpers are not doing their job (fetching the children and pregnant and lactating women and taking them to the center). No matter the how great the nutritional scheme of the ICDS program may be, parents place the most importance on education and day care services, all which can be better provided by the village private school.

4.4 Quantitative Results

The ICDS sample size of boys and girls was a total of 276 participants, with 140 boys and 136 girls. The Andhra Pradesh VLS sample size was a total of 47 with a total of 24 girls and 23 boys. Unfortunately, since there is a large gap between the size of the ICDS data and VLS data, the results depicted below must be taken lightly. There are variables within the VLS data that I was not able to account for, and until the VLS data has a sample size comparable to the ICDS data, these charts can only be used as a model.

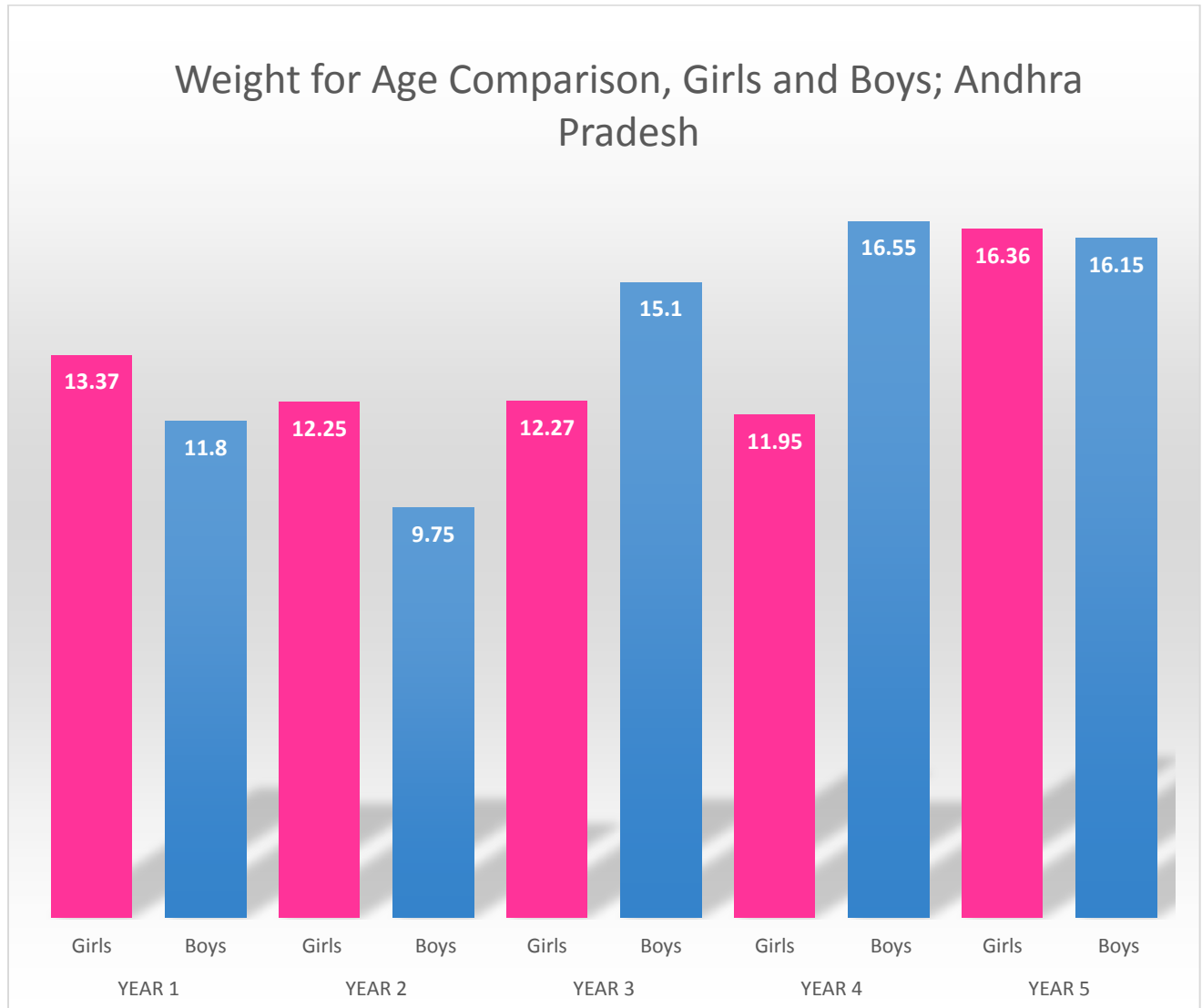
I found that boys were slightly more malnourished than girls in both the ICDS data. In the VLS data, girls were more malnourished than boys, and the anthropometric averages for Andhra Pradesh and ICDS in Aurepalle depict major gaps between the nutritional outcomes of these children. The weight is measured in Kilograms.

Chart 4.3



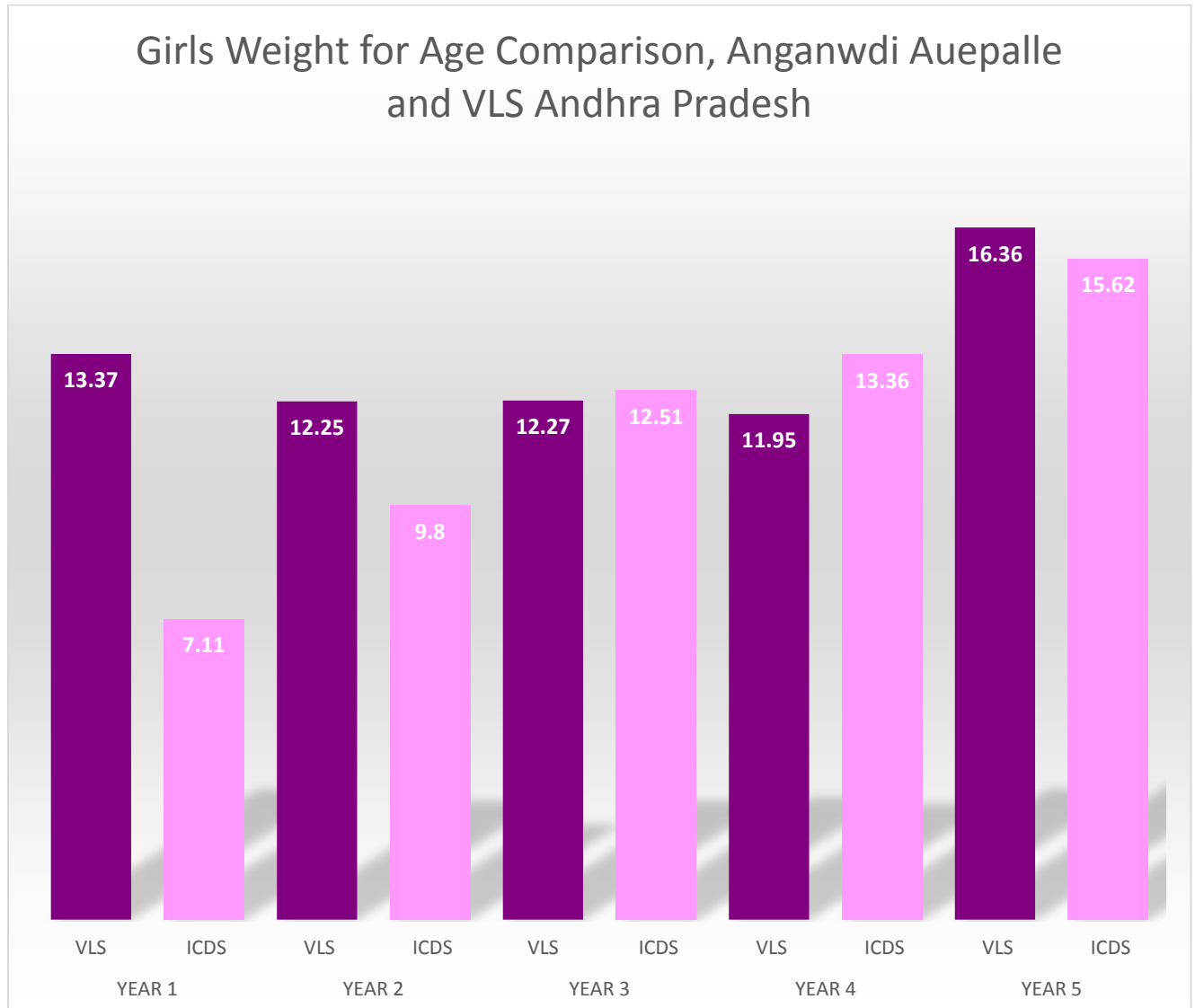
As shown in chart 4.3, boys have a slightly higher weight average than girls in the first year, for the next four years, however, girls have slightly higher weight for age averages than the boys.

Chart 4.4



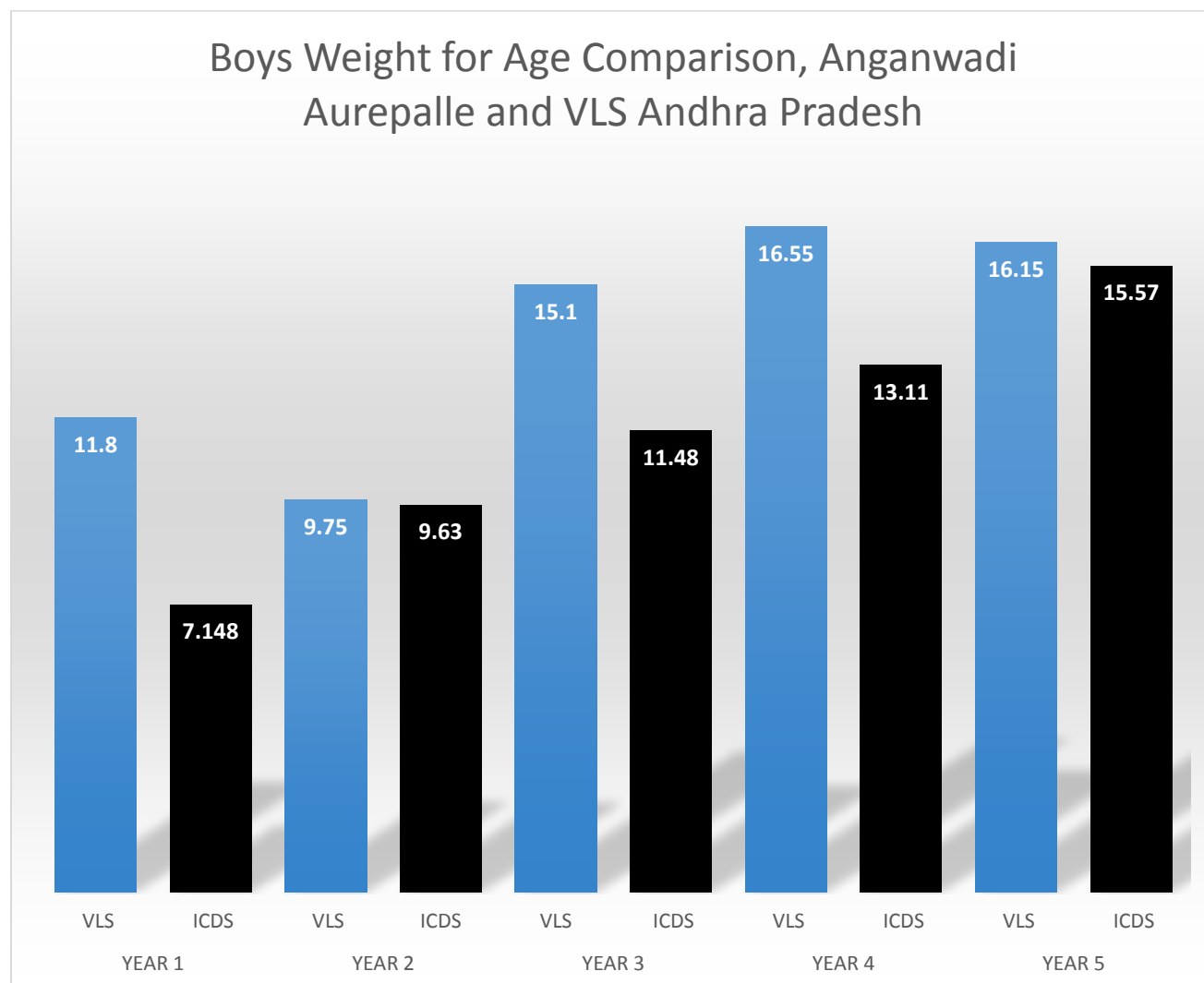
Different results were depicted in chart 4.4, however. Andhra Pradesh boys performed at a much better rate than girls in years one, three, and four. In years two and five girls performed slightly better than boys.

Chart 4.5



As depicted by chart 4.5, in years 1, 2, and 5 the VLS Andhra Pradesh averages were higher than those of ICDS participants. In years 3 and 4, ICDS weight averages were slightly higher than female Andhra Pradesh averages.

Chart 4.6



As depicted by chart 4.6, all male VLS Andhra Pradesh averages were higher than male Aurepalle ICDS participant averages.

Charts 4.5 and 4.6 depict large gaps between the micro (Aurepalle) and macro (Andhra Pradesh) measurements. The purpose was to provide a model of what a possible comparison may look like once more data is present. Until more data is present, it is not possible to do a comprehensive micro to macro analysis.

Compared to the WHO data, all ICDS participants were severely malnourished ranging from -3 (the worst rating of malnourishment) to -1 (the best rating of malnourishment). Both genders never broke past -1 to be in the normal range for their age.

4.5 Qualitative Results

ICDS Beneficiary Questionnaire

The average family is comprised of 6 members, there is an average of 2 children per family, and an average of 1 child participating in the ICDS (the average age when they started attending the program was 20 mos). All respondents claimed to send their children to the center every day it is open, and the majority are not the first members of their family to use the ICDS scheme. Their husbands unanimously supported their children's involvement in the ICDS scheme and the majority joined per teacher persuasion, and were motivated by the safety, education, and food security the scheme provided for their children. All noted that when the ICDS centers were closed, their children were idle and the mothers had to stay at home to take care of them rather than working.

Chart 4.7

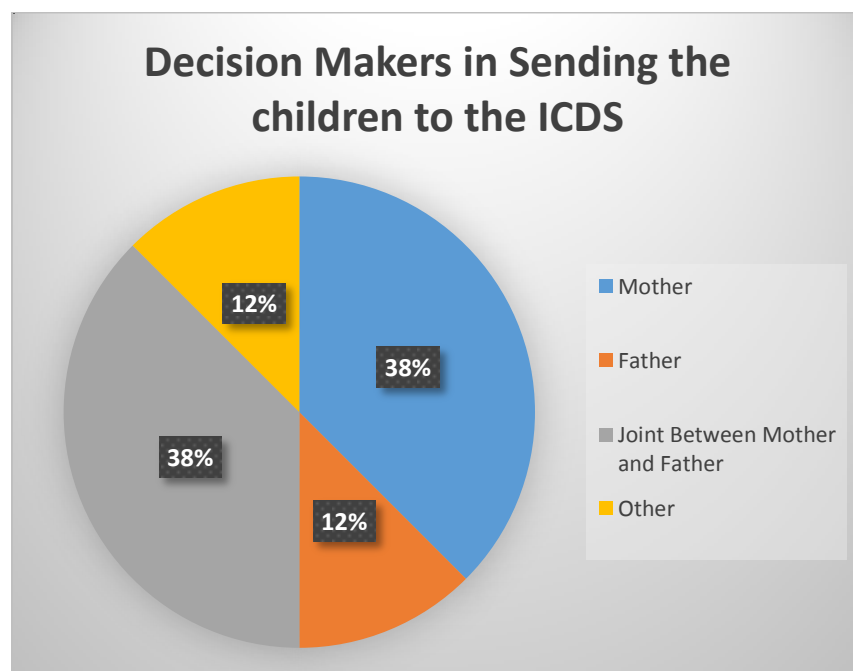


Chart 4.7 depicts the percentages of who decides to send their children to the ICDS per respondents. There was a tie between the decision of mothers and the joint decision between mothers and fathers. This shows that men and women are placing an importance on the ICDS

scheme, and it is a decision that is more so decided by the household or by the main caretaker of the child (the mother).

Chart 4.8

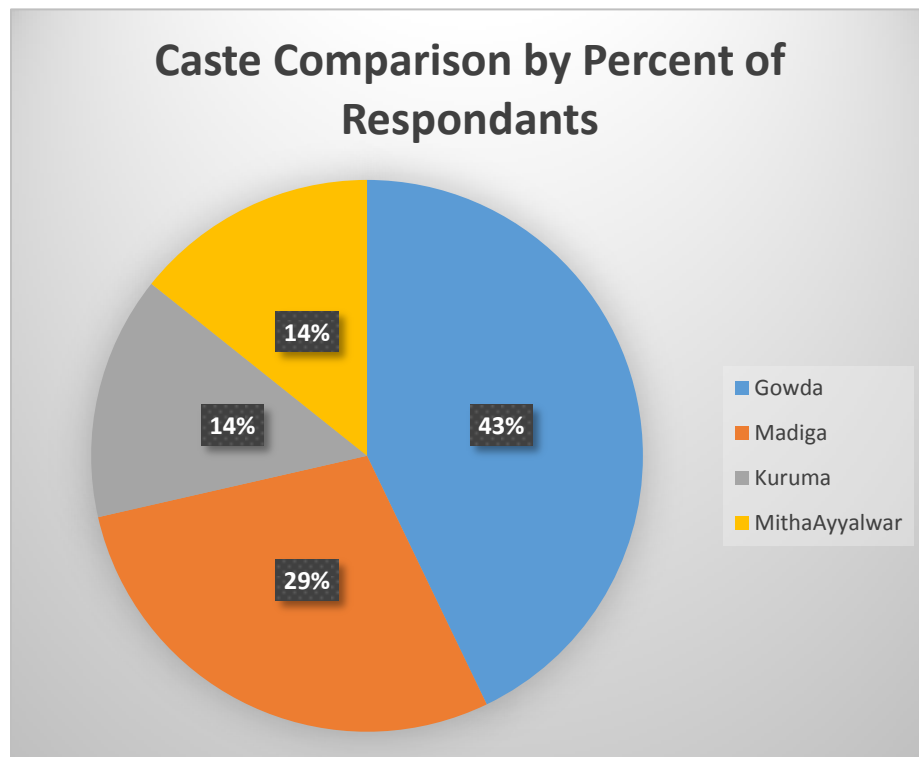
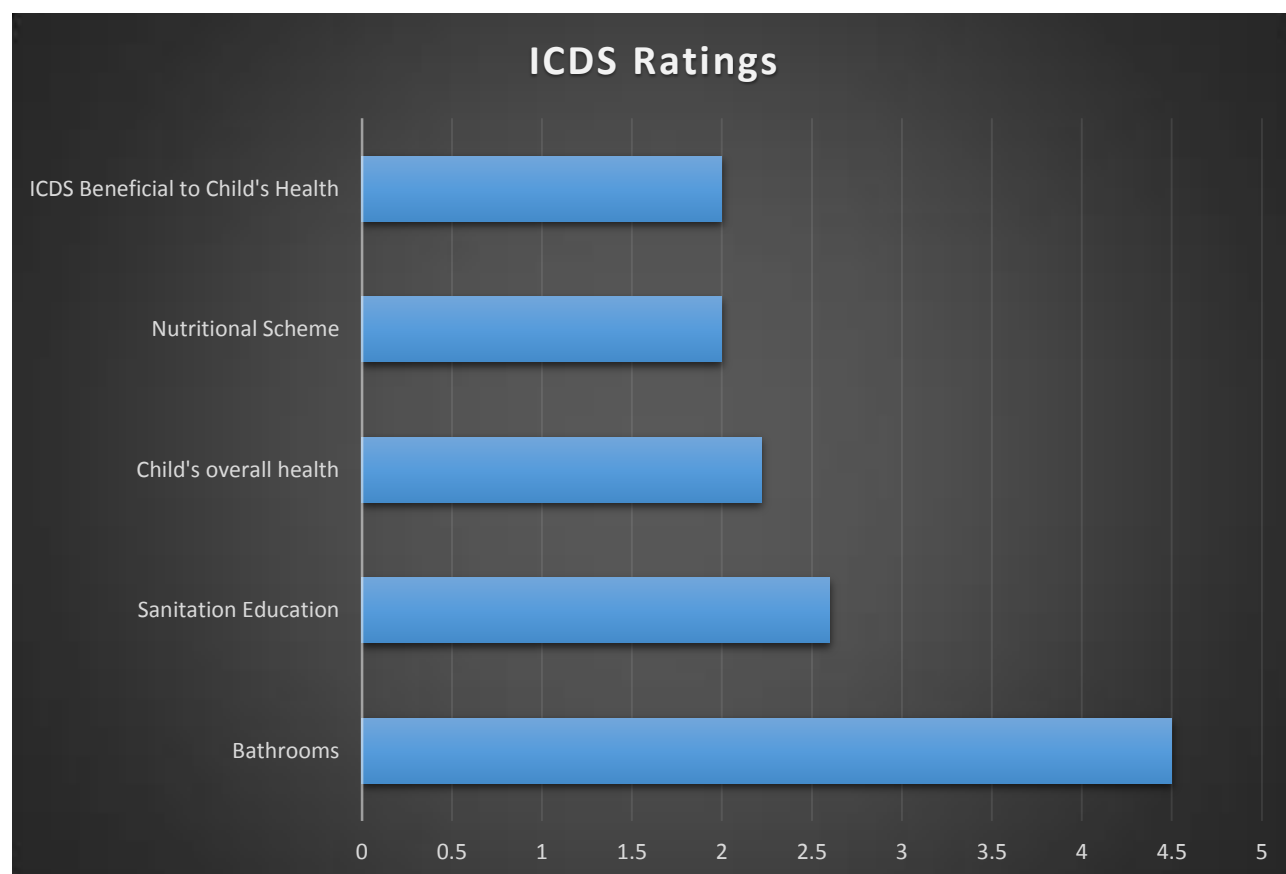


Chart 4.8 depicts the percentage of caste members per respondents.

Roughly 88% of respondents gave halwa to their children, 87% of respondents gave MTF to their children, 63% used the bi-monthly ration of eggs, 87% gave kukure to their children, and only 50% of respondent’s children ate kichidi. After joining the ICDS, all stated that their rice and dal intake has increased, and many stated that they have started to eat more eggs, vegetables, fruits, kukure, MTF, biscuits, and milk. Roughly 50% of respondents stated that their dietary variety has changed since joining the ICDS. The majority of respondents have not stopped eating any food that they ate prior to ICDS involvement.

It is apparent that the ICDS sanitation scheme has been effective in the village as 88% say that they are encouraged to wash their hands and they implement this in their homes before meals and after going to the bathroom.

Chart 4.9

The respondents were asked to rate different services and amenities provided by the ICDS on a scale of 1 to 5 (1 is excellent, 3 is okay, and 5 is the absolute worst, or the amenity is not available). Chart 4.9 shows that the respondents rated the ICDS nutritional scheme very good as well as stating that the scheme is also beneficial to their child's health. On average, the respondents viewed their child's health as very good. The respondents viewed the sanitation as okay, and the bathrooms were deemed as terrible. This chart depicts that parents have found the scheme to be effective towards their children's nutritional well-being.

37.5% of respondents have in home access to drinking water and have an in household water supply, while roughly 50% respondents have individual taps in their households. There is an average of 22 children per each respondent's community, and 75% of households have ration cards and are below the poverty line. There are no NGO's affiliated with their communities.

Roughly 50% of respondents have no complaints regarding the ICDS scheme. They said that the ICDS provides great basic teaching, sanitation, and nutrition. The workers and helpers take great care of their children, and they play fun games and provide good, nutritious food for the kids.

The other 50% of respondents had complaints regarding the ICDS scheme. They stated that the Anganwadi Helper does not gather the children regularly so children the children are not able to attend the school regularly. They complained that the staff does not provide food to their children regularly, and the school hours are too short.

When asked to summarize the general problems faced by their respective communities regarding nutrition, respondents stated that not everyone is able to supply good food for their children like milk, fruits, and vegetables. There is a problem with the drinking water, and there is a lack of nutritional awareness within the community. People are not providing good food for their children because they do not understand the nutritional benefits of food. One respondent's family only had 3 other families in their community and stated that all community members were able to provide great food for their children and no one had any nutritional deficiencies.

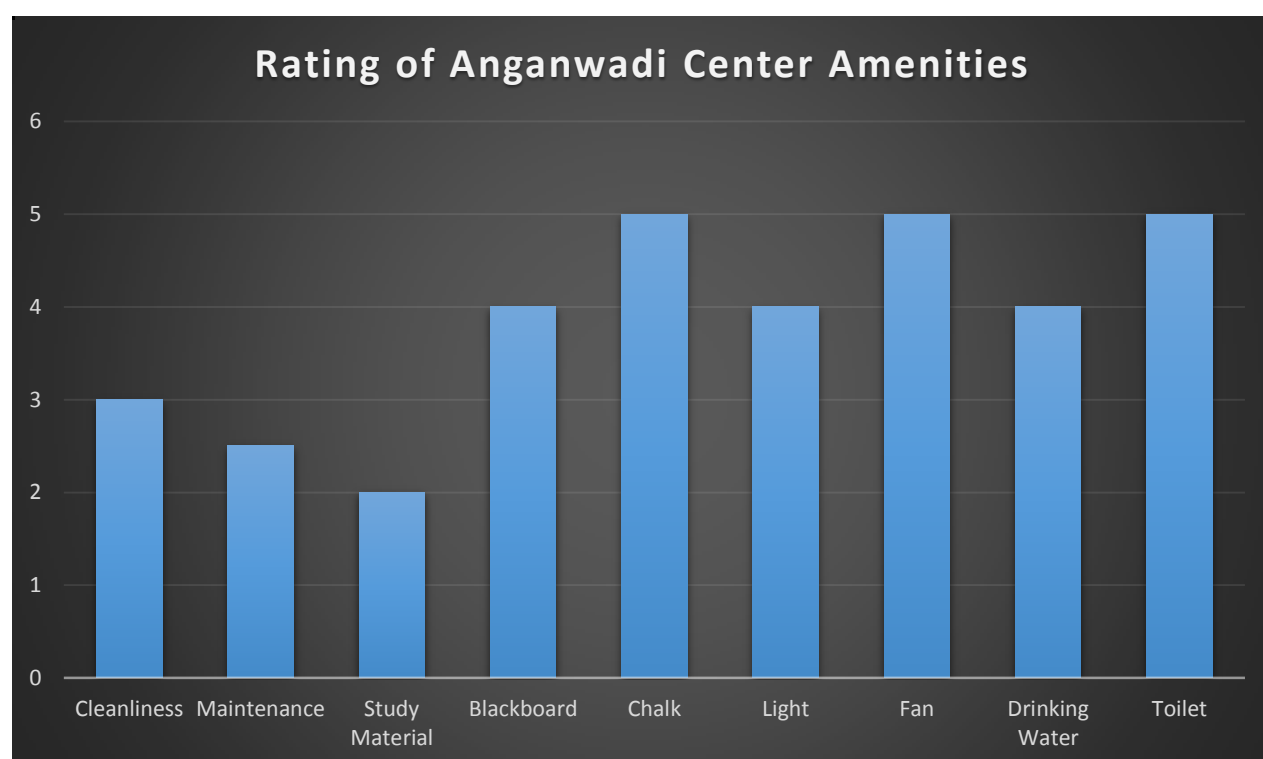
Lastly, respondents were asked to report their general observations of their community. They stated that overall, people are doing much better financially. A lot of families are migrating to Hyderabad, and almost everyone has a good income. People are growing commercial crops like cotton, rice, and castor, and families are now able purchase luxuries like jewelry. Everyone is constructing a new house and all children are being sent to school. Education has become a top priority for everyone in the community. People are now able to provide better food for their children.

Anganwadi Worker and Helper Questionnaire

The average education level for the AWW was 9th class, and all AWH were illiterate. The AWW and AWH are the only members who work in the Anganwadi Centers. There is an average of 28 children per center, and the majority of respondents said that most children come to the center daily while one teacher reported that most children come to her center once every two days, and there is a select 10 who come in every day her center is open. All teach basic education through games, and all children are taught on sanitation and discipline. They are all supported by the Andhra Pradesh state government.

When asked about the problems/difficulties they face with the ICDS scheme, the teachers reported that the government does not pay them adequately, and they do not get food sent to them regularly. One center does not have its own building, and the government does not send money for rent many months of the year. They find it hard when children do not come regularly as many go off to the private school that is open from 8-5pm. Other children opt to attend the government school where they are provided with food, uniforms, and books.

Chart 4.10



I self-assessed the standards of these centers after visiting them and rating them on a scale of 1-5. 1 is excellent, 3 is okay, and 5 is the worst (if an amenity was not at the center, it was given a 5). These ratings were then averaged among all 3 of the centers and logged into this chart 4.10.

As part of the supplementary nutrition program, all centers are providing kichidi, halwa, and kukure. As part of the take home portion, the majority of the centers are providing boiled eggs (they are dictated by the government to provide raw eggs, but since people do not attend the center regularly, they find it easier to boil the eggs and store) twice a month, and MTF for the children 6 months to 3 years.

Chart 4.11

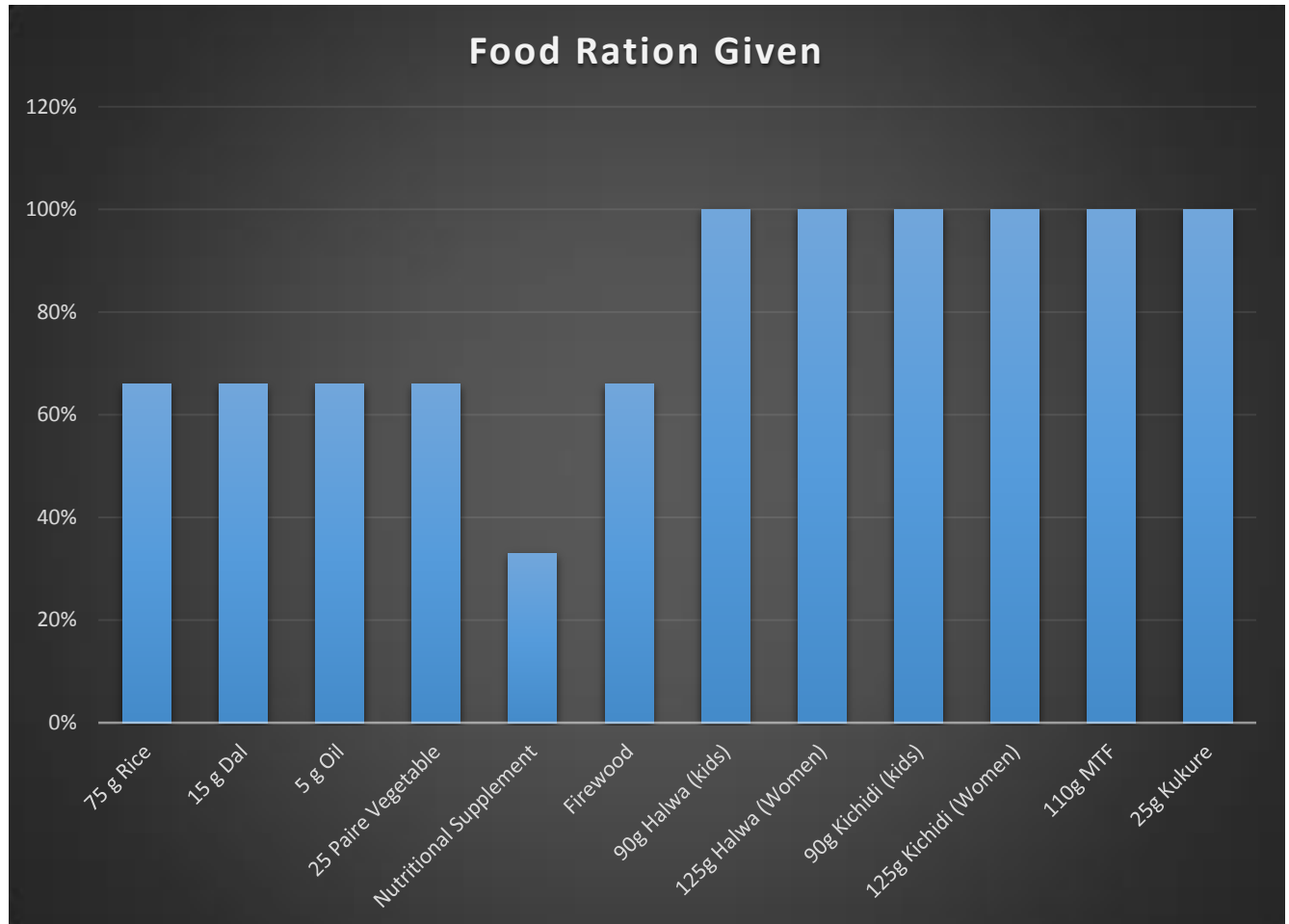


Chart 4.11 depicts the food ration given percentage per respondent.

At two centers a nurse visits twice a week, and a doctor visits all centers once a month. All teachers believe that the nutritional status of the children are being improved through the ICDS nutritional scheme, but children do not come regularly and are unable to reap the benefits.

Focus Group Discussions



Both men and women agreed that all knowledge about nutrition in Aurepalle has come from the ICDS. Many families joined the ICDS scheme because it promoted health and education. The men suggested that the teachers should participate in the program regularly by showing up on time daily, and providing the food for the children. Men noted that the ICDS scheme is very good about taking the children's anthropometric measurements and providing vaccinations to children and pregnant and lactating women. Both men and women agreed that the ICDS staff should conduct the ICDS mother's meetings every month (as dictated by ICDS guidelines). Women accredited the village's health to the ICDS as before the scheme was established, villagers relied on superstitions to heal those who were sick, but now that they have been introduced to modern medicine, they know to send sick people to hospitals for proper care. Women suggested that centers should maintain cleanliness and neatness. All centers should provide nutritious food every day and not just snacks. Centers should provide safe drinking water and the teachers should not only teach by playing methods.

5.1 Conclusion:

In conclusion, the ICDS nutritional scheme is beneficial to childhood growth in Aurepalle. The biggest problem that the nutritional scheme faces in this village is its implementation. The nutritional scheme only works on children who eat all of the food that the ICDS gives them as well as attend the center *daily*. While interviewing, many women stated that it was their fault for their children's under nutrition as they are not feeding them the food that the ICDS provides. They view MTF, Halwa, and Kichidi as lackluster food that is not appealing to their children. Most mothers admitted that their children only eat the snack food on a regular basis. Usually mothers will take the supplementary food given to their children, and feed them to their buffaloes as they have noted that the ICDS food has increased the milk yield.

Because of the short hours that the ICDS center is open, women find it nearly impossible to get any work done. They have opted to send their children to the private school, but unfortunately, the private school does not offer any nutrition programs. Children are sent random days of the week to different centers during lunch break to demand for ICDS supplementary food. The AWW and AWH are put in a hard position because they cannot turn down these children for fear of their parent's complaints. Children are given the food during lunch break, and never come back. The majority of these children are not documented as a part of the ICDS scheme, so when it comes time to perform the monthly anthropometric measurements, the AWW and AWH have no way of contacting these children. These children's nutritional outcome has most likely been bettered due to the ICDS nutritional scheme, and the ICDS has no way of documenting this. This leads to the conclusion that the ICDS nutritional scheme benefits more children in the village than accounted for in the data. To stop this from happening, I suggest that all centers must keep a running list of the name, age, and school of the children who receive ICDS nutritional support. When it is time for measurements, it will be easier to track these students by forming an alliance with the private school whereby all students under 6 in attendance must also register with the ICDS program if they intend on using their supplemental nutrition program.

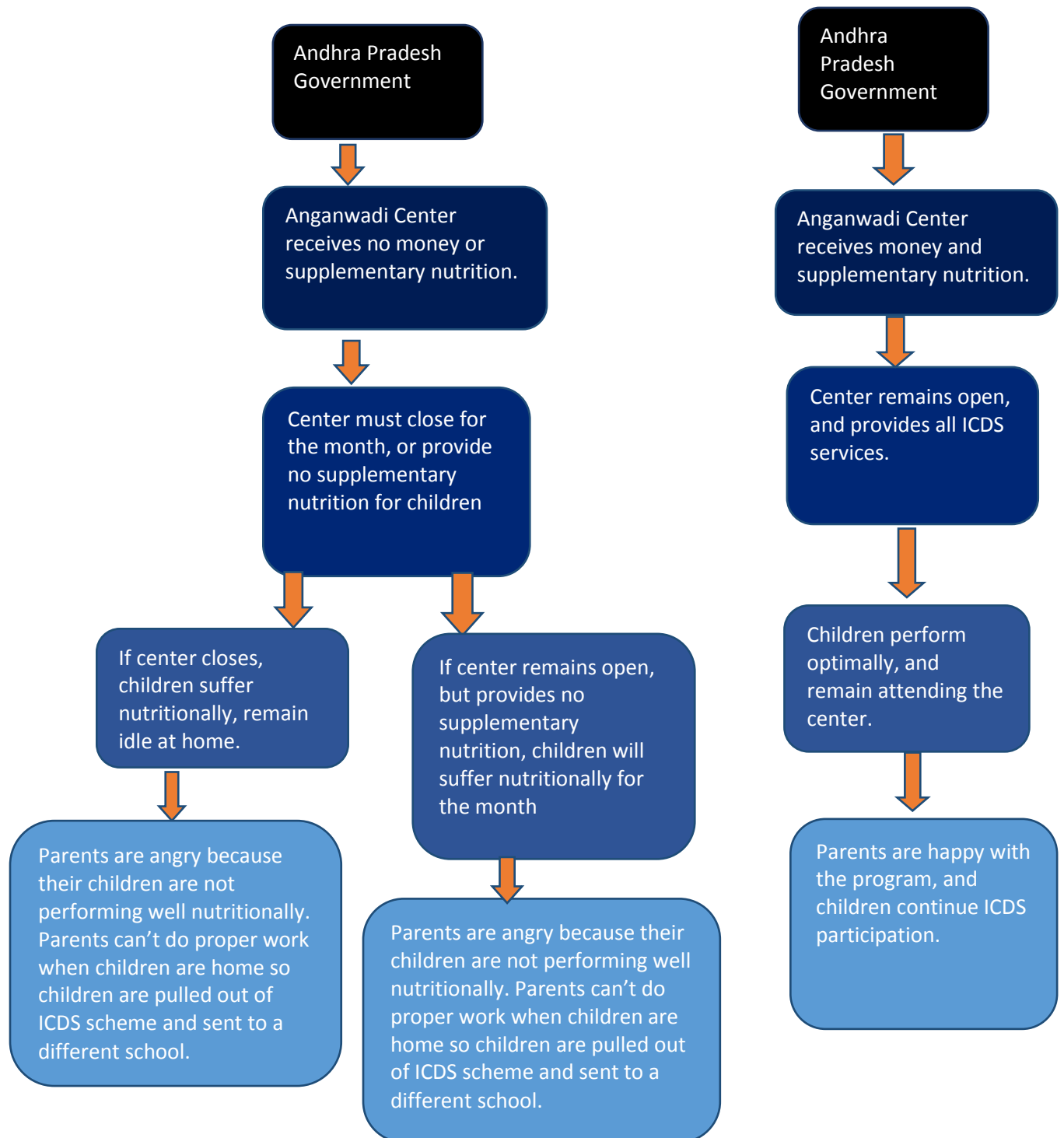
Nutritional awareness in the village is something that is hindering the health of the children in Aurepalle. The majority of respondents commented that people in their communities are not nutritionally aware, and are unable to provide the best possible food for their children. I found

similar results to those depicted in the study done by child rights and you. There is much neglect on the part of the Andhra Pradesh Government in light of nutritional education, and this has led to much neglect by the people of Aurepalle. I suggest that in the monthly ICDS mother's meetings, AWWs should teach parents on the values of nutrition just like they were able to teach parents on the values of sanitation. In three decades, the ICDS sanitation initiative has taught many villagers the importance of cleanliness.

Above all, nutritional awareness is needed in the village of Aurepalle. Making sure that parents are empowered to give their children the best nutrition possible is the only way the children of Aurepalle will see a change in their nutrition outcomes. Team work between the government, ICDS workers, parents, and children is of the highest regard to ensure a proper implementation of the ICDS nutritional scheme.

I suggest that ICDS scheme be located within the government primary schools. Proposing that the ICDS and the other government primary schools worked together would ensure proper care for all children. More parents would be interested in putting their children in the ICDS because it is already located where they will be sending their children to primary school. In the ICDS parent questionnaire, almost all mothers stated that the AWW was their biggest motivator in enrolling their children into the ICDS program. This only boosts hope that the convenient location and teacher motivation will keep more children enrolled in primary school. Primary school teachers and Anganwadi workers can work together to establish a curriculum best suited for the children, and the long term growth of all ICDS child participants can be more closely monitored.

Chart 5.1 is a flow chart depicting the affect the government has on ICDS ground level participation. The left portion of the chart depicts the outcome of a perfect running ICDS scheme. The right portion depicts the scheme's actual implementation in Aurepalle. There are four levels to the scheme, the government, the center, the children, and the parents. If there is a lack of funds produced by the government it greatly affects the scheme's micro-level implantation. In order to have a perfectly running scheme each of these four sectors need to cooperate to ensure meals are given, salaries are paid, and children continue to attend the centers.



Personal Remarks



"To laugh often and much; to win the respect of intelligent people and the affection of children...to leave the world a better place...to know even one life has breathed easier because you have lived. This is to have succeeded."

-Ralph Waldo Emerson

In July of 2012, I was speaking to a man during a plane ride about public policy, international development, and my summer plans. I had said how I would love to do some international work one summer, and he told me about the prestigious Borlaug-Ruan Internship through the World Food Prize Foundation. From that moment I knew that I would do all that I could to make sure that the following summer was not spent in America. He gave me his business card, and I emailed him immediately from the Delta Sky Miles club. Later that week, he introduced me to the World Food Prize staff via email, and a week later I had been invited to attend the Global Youth Institute. I promptly wrote my paper, and sent it to the World Food Prize. Come October, I was in Iowa presenting my paper at the Global Youth Institute! I went on to apply for the Borlaug internship, and made it past the various stages of the selection process. I found out that I had been selected to go to the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), an organization whose mission aligned directly with what I am passionate about,

and I was filled with joy. Now as I am sitting here in India reflecting on this past year, I have so much to be thankful about.

My time at ICRISAT was one that I will never forget. From the beginning I was welcomed into this beautiful community of passionate people who strive to see positive change in the world. I came to ICRIST not knowing much about who I am, and emerged having a strong sense of self that one can only obtain through a journey like this.

Having been born in Zimbabwe, dire poverty is something that I see every December when we go back for the holidays. I thought coming to India would just add to my cultural understanding of poverty, but, instead, it shifted my whole outlook. I never really understood that hunger and poverty exist everywhere until I came to India. I had never been so brokenhearted over a child beggar until I met one in India. I remember my mom asking me why these issues are affecting me more than they usually do while we are in Zimbabwe, and I knew it was because I had fully began to grasp the idea that poverty isn't contained to only one part of the world. There are more children suffering than the ones I see in Zimbabwe every Christmas, or the ones I saw in India over these past two months. Poverty is a reality for much of the world, and that was a painful realization to come to.

This Borlaug-Ruan International Internship has helped me to gain a new perspective on attacking global poverty. I understand that it is not a "One-size fits all" scenario, and that makes it a puzzle even harder to solve. While in India, I formed a new perspective that will forever change how I view the world. After coming back to America, I am often times asked how I feel about spending the summer conducting research to help malnourished Indian children, and I am always caught off-guard. These children helped and changed me more than I could ever help or change them, and for that I am truly thankful. I love my India-family and my Aurepalle brothers and sisters for they have taught me multitudes on love, respect, and kindness. Thank you to the World Food Prize Foundation, as I am forever indebted to you for this experience. I wholly appreciate the prayers, the encouragement, and the support. Thank you to everyone who has been with me through this journey whether in flesh or in spirit, and I am positive that there will be many more to come.

Sincerely,

Tariro Makoni

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Appendix

Nutritional Information on ICDS supplementary nutrition:

Kichidi

Ingredients: Roasted Wheat, Soya Granules, Palm Oils, Green Dal, Salt, Spices.

Fortified With: Calcium, Iron, Zinc, Vitamin A, Vitamin B, Vitamin B₁, Vitamin B₂, Folic Acid

Nutritional Facts: 410 Kcal per serving (90 g), 15.8 grams protein

Halwa

Ingredients: Roasted Wheat Flour, Green Dal, Sugar, Palm Oil, Ilachi

Fortified With: Calcium, Iron, Vitamin A, Vitamin B₁, Vitamin B₂, Vitamin C, Folic Acid, Niacin

Nutritional Facts: 450 Kcal per serving (90 g), 10.5 grams of protein

Modified Therapeutic Food

Ingredients: Roasted Wheat Flour, Sugar, Soya, Dal

Fortified With: Calcium, Iron, Vitamin A, Vitamin B₁, Vitamin C, Folic Acid

Nutritional Facts: 440 Kcal per serving (90 g), 13.9 grams of protein

Kukure (Snack)

Ingredients: Roasted Wheat Flour, Maize, Green Gram, Refined Oil, Salt, Tumeric, Soda, Spices

Fortified With: Calcium, Iron, Zinc, Iodine, Vitamin A, Vitamin B₁, Vitamin B₂, Vitamin C, Folic Acid

Nutritional Facts: 400 Kcal per serving (25g), 12 grams of protein

ICDS Anganwadi Worker and Helper Questionnaire Interview

- 1.) Anganwadi Worker's Name: _____
- 2.) Anganwadi Helper's Name: _____
- 3.) Education Level of AWW: _____
- 4.) Education Level of AWH: _____
- 5.) Number of people working in the Anganwadi? _____
- 6.) Number of students who have registered with Anganwadi? _____
- 7.) Timings of the Anganwadi: _____

8.) What is the regularity of children coming to Anganwadi?

9.) What is being taught to the children at Anganwadi?

10.) Is the teacher maintaining punctuality and regularity in coming to the Anganwadi? **Y OR N**

Explain the reason behind this:

11.) Is the teacher supported by the Government or any other NGO's?

12.) Basic Amenities:

Basic Amenity	Status – Yes or No	Rating (1=best ,5= worst)
1. Cleanliness		
2. Maintenance		

3. Study Material		
4. Blackboard		
5. Chalks		
6. Light		
7. Fan		
8. Drinking Water		
9. Toilet Facility		

13.) Any problems or difficulties you are facing in the ICDS? Explain.

14.) Is food being provided to the children? **Y OR N**

SNo.	FOOD	REMARKS							
1.	Quality								
2.	Quantity								
4.	Regularity								
5.	Record maintained and its frequency (1-5)								
	Ration Supply	Grams	rice	dal	oil	vegetable	Nutrition supplement	Cooking fuel (that	Others

								she uses)	
Take home portion									
Is it on a weekly or daily basis?									

15.) List all food fed at the center. list ration in grams, who it is given to (ie. Children aged 3-6 years, pregnant and lactating women ect.), and how often it is provided):

16.) List all food included in the take home portion of the program. List ration in grams, who it is given to (ie. Children aged 3-6 years, pregnant and lactating women ect.), and how often it is provided:

17.) What are you instructed to do with the food?

18.) Officials Involved and how frequently they visit the Anganwadi Center:

1. CDPO Officer _____
2. Nurse _____
3. Doctor _____
4. Supervisor _____
5. Supplier _____

19.) Are there any NGO's Involved with the Anganwadi? If so, which ones and what do they do?

20.) Is there an ASHA worker in this village? What is her role? Does her work complement your work?

21.) Do you think the ICDS is helping to improve the nutritional status of children in your village? Please explain.

22.) Your observations on the implementation of the ICDS program at your center:

ICDS Questionnaire Interview

1. Age: _____
2. Education Level: _____
3. Husband Age: _____
4. Husband Education Level: _____
5. Head of Family Name: _____
6. VLS Household ID: _____
7. Caste: _____
8. Mother's Name: _____ ; Age: _____
9. Father's Name: _____ ; Age: _____
10. Education level of Mother: _____
11. Education level of Father: _____
12. Number of Family Members: _____
13. Number of children: _____
14. How many children do you have participating in the ICDS? _____
15. At what age did they start attending the AWC? _____
16. How often do they attend the AWC (1=every day it's open, 5= almost never)? _____
17. When did you join the ICDS? _____
- 18. Are you the first member of your family to use the ICDS? Y or N**
19. Why did you want to join the ICDS?

20. Who encouraged you to join the ICDS/ What motivated you to join ICDS?

21. Who makes the decision to send the children to the ICDS? Circle
a.) Father b.) Mother c.) Other family member: _____

d.) Joint Decision between: _____

22. Does your husband support your ICDS involvement? Y or N

a.) If yes, Why? If no what does he think of the program?

23. How often do you use ICDS provided services on scale of 1 to 5 (1 being very often, 5 being very rare)? _____

24. Name the ICDS services you use:

25. What do you do when the ICDS is not open?

26. Was there ever discontinuity in your ICDS involvement? Y or N

If yes, Why?

27. How do you view the childhood education received from the ICDS (1=excellent, 5= very poor)?

28. On a scale of 1-5, 1 being the best and 5 being the worst, how would you rate the ICDS overall?

Why?

29. How would you rate the bathrooms in ICDS facilities (1=best, 5=worst)? _____

- 30. Is washing of hands encouraged in ICDS facilities? **Y or N**
- 31. How would you rate the ICDS sanitation overall (1=best, 5= worst)? _____
- 32. Has dietary variety changed since joining ICDS? **Y OR N**
- 33. What food intake has increased since joining ICDS?

- 34. What foods have you stopped consuming since joining the ICDS?

- 35. How would you describe your child’s nutritional status (1=excellent/normal range, 5= malnourished, wasted, or obese)? _____
- 36. What nutritional deficiencies (if any) do your children suffer from?

- 37. How beneficial do you find the ICDS scheme in your child’s overall health (1=extremely helpful, 5= not beneficial at all)? _____
- 38. How would you describe the ICDS nutritional scheme (1= excellent, 5= very poor)? _____

Observation-

- 39. **Religion of the Community** : Dominant: _____ Others: _____
- 40. **Language spoken by the Community** : Dominant: _____
Others: _____
- 41. **Occupation of the community people** : Dominant: _____
Others: _____

- 42. **Name of the Community Leaders** :

43. What is your average yearly income?

44. What is the total number of children aged 0-6 in the community? _____

45. Basic Amenities in the community

Water supply: **Y OR N**

Common Tap: **Y OR N**

Individual Tap: **Y OR N**

Drinking water: **Y OR N**

Drainage: **Y OR N**

Road: **Y OR N**

Street Light: **Y OR N**

Toilet Facility:

Common: **Y OR N**

Individual house: **Y OR N**

46. Are the community people aware of the services provided by the ICDS? **Y OR N**

47. Does your household have ration cards? **Y OR N**

48. Below Poverty Line card: **Y OR N**

49. Above Poverty Line card: **Y OR N**

Individual Community based Questionnaire Interview:

50. Are there any NGO's affiliated with your community? **Y OR N**

If yes, explain what the NGO does:

51. Household Survey:

No. of working members	total Income of the Household	No. of children	No. of children going to Anganwadi / School	No of girl children	No of girl children going to Anganwadi / School

52. Complaints and Comments for the operating Anganwadi Center:

53. General problems faced by the community people regarding nutrition:

54. General observations of your community/ ending comments:

OBJECTIVE: HOW IS THE NUTRITIONAL ASPECT OF THE ICDS BEING IMPLEMENTED IN THESE MICRO-LEVEL AUREPALLE VILLAGES?

Number of Focus Group Participants: _____

Targeted Group: Mothers who are active ICDS and non-ICDS participants aged 15-45

(Introduction: Who I am, what I am doing in India, and what I intend to use this focus group discussion for)

- How many of you are ICDS participants?
- How many years have you been participating in the ICDS program?
- From where did you hear about the ICDS?
- Is nutrition important to you? To those who said yes, explain why. To those who said no, explain why not.
- What was your motivation to join the ICDS?
- How has joining the ICDS benefited you?
- Do you feel as though the ICDS has changed your life? To those who said yes, explain why. To those who said no, explain why not.
- Is there something that you would like to see changed in the ICDS? Explain.
- What are your suggestions for a better running ICDS program?

OBJECTIVE: HOW IS THE NUTRITIONAL ASPECT OF THE ICDS BEING IMPLEMENTED IN THESE MICRO-LEVEL AUREPALLE VILLAGES?

Number of Focus Group Participants: _____

Targeted Group: Spouses and Fathers of ICDS participants

(Introduction: Who I am, what I am doing in India, and what I intend to use the focus group for)

- How many of your households are participating in the ICDS?
- How many years has your household been participating in the ICDS program?
- From where did your household learn about the ICDS?
- Is nutrition important to you? To those who said yes, explain why. To those who said no, explain why not.
- What was your household's motivation to join the ICDS?
- How has joining the ICDS benefited you?
- Do you feel as though the ICDS has changed your life? To those who said yes, explain why. To those who said no, explain why not.
- Is there something that you would like to see changed in the ICDS?
- What are your suggestions?