

MY INDIAN SUMMER  
Exploring Science with a Human Face



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By  
RACHEL R. GANSON

The World Food Prize Foundation  
1700 Ruan Center  
666 Grand Avenue  
Des Moines, IA 50309 USA  
[wfp@worldfoodprize.org](mailto:wfp@worldfoodprize.org)



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### **Abstract**

Efforts to end world hunger essentially require focused measures to improve the nutritional status of people living in poverty. Much research and ensuing initiatives have had favorable results in increasing the income of families living in poverty. Contrary to initial hypotheses, however, studies have indicated that total household income does not necessarily correlate directly with household nutrition. Taking a closer look, the query of whether female income has more impact on nutritional status than total household income becomes essential.

This qualitative study attempts to analyze whether the income and empowerment of women has a correlative impact on the nutritional status of the family or household. To analyze this theory, it is important to look at policies and institutions (e.g., Self-Help Groups) directed at increasing female income and empowering women. Through field research and the International Crops Research Institute for the Semi-Arid Tropic's (ICRISAT) Village Level Studies (VLS) data analysis, the study presents some ground level insights on SHG involvement and household nutrition. The results found in this study suggest that SHGs should be used by organizations wanting to distribute nutritional information. Due to the empowering effects of SHGs and the documented tendency of women to share information with other villagers, especially neighbors, SHG members make ideal disseminators of information including knowledge and advice regarding food and nutrition.



*Photo: Focus group discussion in Aurepalle of Non-SHG members; 2012*

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I would also like to thank the International Crops Research Institute of the Semi-Arid Tropics for hosting me this summer. ICRISAT truly became a second home – not only because it provided me with lodging and meals, but also because the people who work there became mentors, supporters, guides, teachers, colleagues and friends. In short, this summer I learned about the soft side of hard science. The scientists at ICRISAT who have made it their profession to form hypotheses, conduct research, collect sample data, analyze numbers and discuss theories perform these calculated tasks for the betterment of humanity. It was inspiring to witness and participate in that type of scientific endeavor – using science to reveal realities of humanity. I would specifically like to thank the staff of the Markets, Institutions and Policies (MIP) department for warmly welcoming me into their office and aiding me in my research project. Particularly, **Dr. MCS Bantilan, R. Padmaja** and **K. Kavitha** were invaluable mentors throughout my study. Additionally, I want to thank **Mr. Mohan Rao** and **Ramana Reddy** for assisting me in field research data collection. A special thank you is also extended to the villagers of Aurepalle for their cooperation and patience during my field research and especially for their trust, honesty and gentle welcome into their village and family homes during my stay.

Finally, I am forever indebted to my teachers, friends and family for their roles in making this opportunity a reality, a success and an experience I'll never forget. Thank you to my **Geneseo High School teachers** who provided guidance and support. I'm so very grateful to the friends I made in India, other interns I worked with at MIP who used age and experience to help this 17-year-old learn the ropes, and to my friends in the US who have shared this journey with me from beginning to end. I would like to thank **Dad, Aaron, Sarah, Ryan, Matthew, my grandparents and my extended relatives** for being the best family I could have asked for, for encouraging me to have goals and dreams and for giving me wings to pursue them —I love you all so much! I'm especially thankful for my **Mom**, to whom I could never express my gratitude fully. She's always been with me through every step of my life, even when I decided to fly away on this journey. Thank you all for loving me so much that I could feel it thousands of miles away.

## 1. Introduction



*Photo: Self-Help Group members at a focus group discussion in Aurepalle; Aurepalle 2012*

### 1.1 Personal Background

It is safe to say that even a year ago, I couldn't have imagined spending the entire summer before my high school senior year in India—or honestly, outside of my rural hometown in Geneseo, Illinois. However, a seed was planted during my participation at the Global Youth Institute in the fall of 2011, and I gained a completely new perspective on opportunities regional and global efforts to end a cause I have longed to be a part of initiatives within my school and was at this conference that I decided Borlaug-Ruan International. When I first began the process of position as a 2012 Borlaug-Ruan Intern, I wasn't sure what to expect; I a fervent desire coupled with a science background that may be organization's efforts. Following a comprehensive application and interview process, I was overjoyed to learn I had been selected for an internship position. My placement at the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) in India only compounded my excitement for the summer to come!



available to join world hunger—beyond my own community. It to pursue a Internship. applying for a International just knew I had strong math and favorable to the

I moved to Geneseo, Illinois shortly after I was born in Peoria, Illinois, to Kyle and Michelle (McAvoy) Ganson and have lived there ever since. Living in a small, agriculture-based town, I have been surrounded by a close-knit and supportive community my whole life. My family has long-time agricultural roots tied to this area, and my grandfather continues to run our family farm that was established nearly 175 years ago when my great, great, great grandfather emigrated from Belgium. Though my parents are public educators, not farmers, I live on ten acres of oak savannah that my family and I have restored to native prairie as a conservation family hobby. Some of my other personal interests involve high school athletics, student government, youth ministry and social justice. My academic interests include mathematics and science, and I will pursue a major in health sciences and nutrition when I enroll in a university in the fall of 2013. In college I hope to continue my research on nutrition and gender development and participate in student medical brigades or other student programs that provide medical assistance to people living in poverty in the US and in developing countries around the world. I aspire to graduate from medical school and work with organizations that provide nutrition education and medical care for people in underdeveloped areas of the world.

I believe it is because of my background that I was able to travel so far away for such an extended period of time at such a young age. It is also from my background and from this internship experience that my interest in

gender studies was developed. I realize how blessed I am to come from an environment where strong, independent women are visible and valued. The knowledge, dedication and passion of the female scientists at ICRISAT and the strength, courage and resilience of the women in the village of Aurepalle inspired me, and I feel encouraged to follow in these women's footsteps to promote gender development. From my extensive ICRISAT literature review, my experience with the culture of rural India and my own research study, female empowerment has become a topic I hold very dear because it is so integral to the success and wellbeing of the family unit. I am so thankful to ICRISAT for allowing me to study and gain firsthand experience in this area and for affirming my desire to continue this type of work in the future.

### ***1.2 ICRISAT, Markets, Institutions and Policies, and “Science with a Human Face”***

As a non-government organization (NGO), ICRISAT conducts research in Asia and Africa's semi-arid, or dryland tropics—an area covering 55 countries, 6.5 million square kilometers and over 2 billion people. I was placed at ICRISAT's headquarters, located in Patancheru, Andhra Pradesh, India, and there are two regional hubs and four county offices in Africa. ICRISAT is also one of fifteen other organizations belonging to the Consultative Group on International Agricultural Research (CGIAR), a partnership seeking to collectively conduct and share research concerning improved food security. In order to reach their goal, ICRISAT has adopted an Inclusive Market-Oriented Development (IMOD) process. This strategy includes enabling smallholder farmers to produce a surplus, to either be stored for personal use and/or sold at markets, thus encouraging farmers to move beyond subsistence farming.

There are four research programs that make up ICRISAT: Resilient Dryland Systems, Grain Legumes, Dryland Cereals and Markets, Institutions and Policies. I was placed in the latter department, Markets, Institutions and Policies (MIP) under the guidance of Dr. Bantilan, R. Padmaja and K. Kavitha—however, my mentors were often gone on long business trips, so I conducted my research primarily independently. MIP deals primarily with how the research conducted in the other three departments can be transferred to the rural farmers to produce the greatest effect. My research, on Nutrition and Gender Development, pertained to how women can be included in this learning process to improve the nutritional status of their household.

I was ecstatic about my placement at ICRISAT, especially because I identified so well with the approach it took regarding its research: “Our approach is through partnership-based international agricultural research-for-development that embodies *Science with a Human Face*.” I've always believed science is an active endeavor, not a sedentary one. I'm so grateful I had the opportunity to actually work with rural farmers, witnessing firsthand how the important research done in labs comes to life in the fields. This summer, I fully realized that the driving factor in any science, but particularly when it comes to food insecurity, is the *human face* it is done for.

### ***1.3 Self-Help Group Background***

Self-Help Groups (SHGs) are micro-financial institutions for women in rural villages. Through the efforts of ICRISAT research and development, SHGs were established in the mid-1990's in several rural villages near Patancheru, India for the primary purpose of increasing total household income by empowering women to contribute to overall family finances, and they have achieved considerable success over the past several years. Self-Help Groups are easily replicated, which has contributed to their rise in popularity. In addition to the social aspect of SHGs, participants meet in small groups on a regular basis and contribute a specific monetary amount to a collective savings. Once groups obtain a certain amount of money, reserved as collateral, the groups can then begin receiving loans from banks. Each woman participant can borrow a portion of the total loan to use for

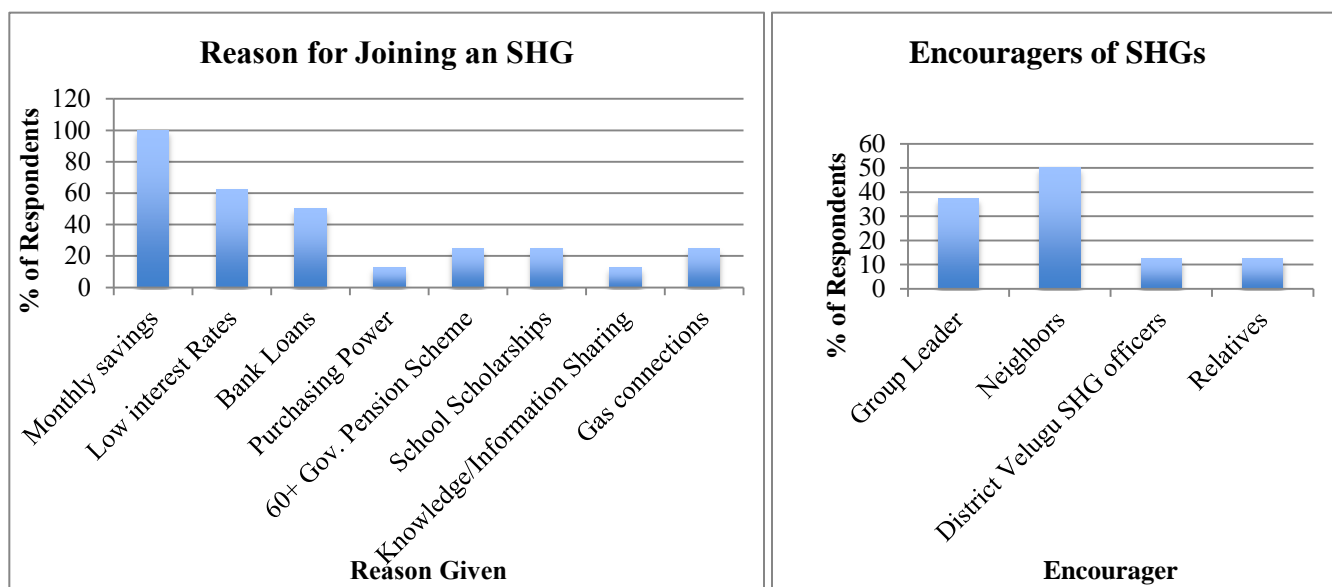


a specific, group-approved business endeavor, and repayment is made with a lower interest rate than that of typical bank loans (one of the key factors to the success of SHGs).

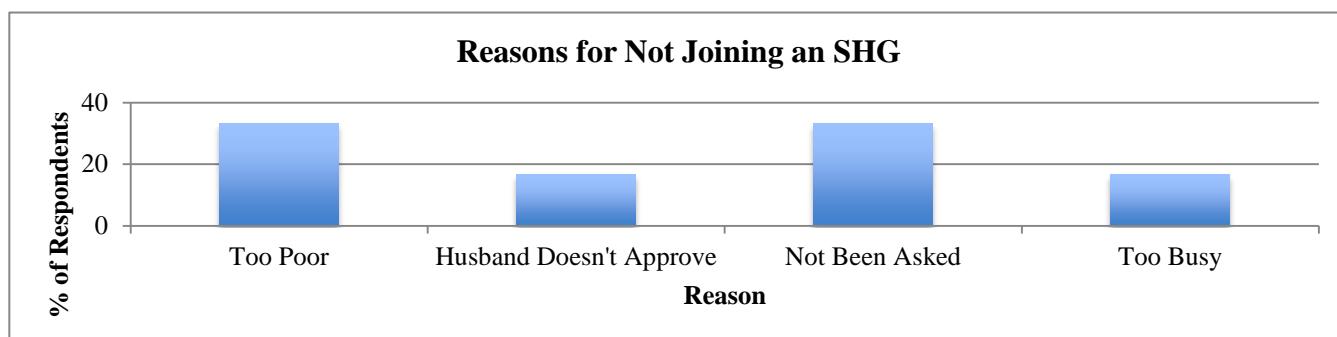
To date, there are currently 62 active SHGs in Aurepalle. Each group contains a minimum of 12 members and a maximum of 15 members. The groups meet on a monthly basis and contribute a small amount - approximately 100 Rs. Also in Aurepalle, there is a Federation of SHGs, which also meets on a regular basis. Two members from each SHG are invited to represent their group at the meetings. From the Federation, two members are also invited to join village meetings to discuss issues with Aurepalle village leaders. It is evident that SHGs have indeed empowered women socio-economically.

It is well known among ICRISAT scientists who study gender development that SHGs have a major impact on the empowerment of women. All of the interviewees in my field research study, both SHG and Non-SHG participants, agreed that involvement in SHGs leads to empowerment. Because of the access to credit, women have more purchasing and decision-making power in the household than before (Palacios, 2012; Bantilan and Padmaja, 2008). Also, the women improve their public speaking skills when involved in SHGs, which makes them more likely to speak their mind. When conducting focus group discussions with SHG members, it was clear that the women were not afraid to speak out anymore (since joining a SHG); each participant had something to say and was very vocal in relaying their opinions.

The primary reason proffered for joining an SHG is for regular monthly savings, followed by the low interest rates and bank loan opportunities. Other reasons for joining include government schemes (initiative) targeted at SHG members, such as pensions for elderly persons (60+ years), student scholarships, and gas connections for households. The primary encouragement for joining and maintaining SHG involvement came from neighbors.



The two main reasons for not joining an SHG are due to some respondents' inability to contribute a monthly amount – simply put, they were too poor - or some respondents had not been asked to join an SHG. The fact that certain persons had not been invited to join and, although they were interested did not seek membership in a SHG, indicates the extent to which social relationships play a role in SHG involvement.



#### ***1.4 Aurepalle Village Profile***

The village Aurepalle belongs to the state of Andhra Pradesh, and is located in the Madgul mandal of Mahbubnagar District (Rao et al., 2011). It has been one of ICRISAT's VLS villages since 1975, and the current village reporter is Mr. Ramana Reddy. It is the village reporter's job to serve as a liaison and live in the village to build trust and communication between village members and ICRISAT. Originally, the village was called Raskulpet, however, after outbreaks of diseases such as cholera and plague, which killed about 10% of the population, several households decided to move about 1.5 km west to escape. The roots of the name "Aurepalle" come from the Urdu word for "another" and the Telugu word for "village," which are "aour" and "palle," respectively. This move occurred in 1700. The current population of Aurepalle is approximately 5000. A timeline of other important events in the development of Aurepalle can be found in the table below.



Table 1.3.1

| Year | Event   | Type                  |
|------|---|-----------------------|
| 1700 | Village was established and renamed from Ruskulpet to Aurepalle   | Neutral               |
| 1945 | School with a single teacher was established up to II standard (only teacher Gulam Rusool).   | Positive              |
| 1947 | Razakar movement and its decline, the peasants were terrorized by the Nizam's rule.   | Negative              |
| 1951 | School upgraded up to 4 <sup>th</sup> class, had three teachers, post office was established.   | Positive              |
| 1959 | Many people died with Cholera. Government provided medicines and sanitization and relief.   | Negative              |
| 1962 | Electricity was introduced for domestic use, street lights and for lifting water for agriculture.   | Positive              |
| 1965 | PACS was established, which helped their farmers to sell their goods.   | Positive              |
| 1966 | Gram Panchayat was formalized and helped to bring development and welfare schemes.  | Positive              |
| 1968 | First hand pump was installed for drinking water supply.  | Positive              |
| 1970 | Co-operative milk collection centre was established to encourage dairy.   | Positive              |
| 1972 | Severe Drought, No food, Cattle died, Lack of employment, and Hunger.   | Negative              |
| 1973 | Land ceiling act was introduced and excess land was distributed to landless households.   | Positive              |
| 1973 | First housing scheme on subsidy under Indira Gandhi for SCs and STs.  | Positive              |
| 1975 | ICRISAT office established posting village investigator.  | Positive              |
| 1978 | Adoption of improved agricultural technology, including fertilizers, seeds and pesticides.  | Positive              |
| 1983 | Traditional governance structure broken down. Mali Patel, Police Patel and Patwari system was abolished. Village Assistant was appointed to look after the village. | Positive for the poor |
| 1988 | Drilling of borewells for water for agriculture started.  | Positive              |
| 1990 | Out migration to Hyderabad because of improved road and transport facilities.   | Positive              |
| 1992 | Drying of open dugwells of borewells intensified due to erratic rainfall.   | Negative              |
| 1992 | Commercial crop cotton introduced. This led to decline in area under Sorghum, and millets.  | Positive              |
| 1996 | School was upgraded up to 10 <sup>th</sup> standard.  | Positive              |
| 1997 | First self- help group (SHG) formed. At present 51 groups with 12-15 members in each group.   | Positive              |
| 1998 | Overhead tanks for supplying drinking water were constructed by the gram Panchayat.   | Positive              |
| 2001 | Second generation VLS started.  | Positive              |
| 2001 | Pension scheme (old age, widow and handicapped) for the poor (Rs. 200/month).   | Positive              |
| 2002 | New Housing scheme for the poor with subsidy of Rs.20, 000 for construction of houses.  | Positive              |
| 2002 | Drought existed.  | Negative              |
| 2004 | Food for work program started and cement roads were constructed in the village.   | Positive              |
| 2005 | BT ( <i>Bacillus thuringiensis</i> ) Cotton was introduced, and now it is 100% in the village.  | Positive              |
| 2006 | Land values started increasing in the village due to construction of International airport.   | Positive              |
| 2007 | National Rural Employment Guarantee Scheme (NREGS).   | Positive              |
| 2008 | Indira Awas Yojana (subsidy on construction of new houses and toilets).   | Positive              |
| 2009 | Construction of veterinary hospital and gram panchayat office is under progress.  | Positive              |
| 2009 | A drinking water project from Krishna River has reached the village.  | Positive              |

Source: "Dynamics and Development Pathways in the Semi-Arid-Tropics: Aurepalle Village" by Rao, M.Y., et al., 2011

According to the table, the first SHG was established in Aurepalle in 1997. From the focus group discussions conducted in this study, however, villagers agree that the first SHG was not formed until 1999-2000. Also, it was reported during focus group discussion that there are currently 62 active SHGs in Aurepalle, not 51 as indicated in the table. However, information not disputed is the high participation rate in SHGs in Aurepalle. This high participation rate has led to the most apparent impact on the empowerment of women out of the six original VLS villages (Palacios, 2012).

The three main caste groups historically found in Aurepalle are forward caste (FC), backward caste (BC), and schedule caste (SC) (Rao et al., 2011). The forward caste is considered the upper caste. The traditional occupations lower-middle class generally belongs to the BC households, while the SC households (lower class), were not allowed to sit with the other household castes. However, the caste structure is not so rigid and strictly

observed nowadays, although there are still lingering prejudices against the SC caste (i.e., they are not permitted entrance into the main temple and there remain separate SC-designated locations for drinking water).

Hinduism is the most common practiced religion in Aurepalle, with only one Christian and eight Muslim households in the village. Educational facilities were established in 1945, and have been expanded over the years. Currently, over 80 students are enrolled in school, and government schemes do reach the schools of Aurepalle (i.e., tuition waivers, free textbooks and the mid-day meal scheme).

The closest market to Aurepalle is approximately 15 km away, and the main transportation to/from the market is by auto-rickshaw (although a few households have their own auto transportation). In Aurepalle most households have their own outdoor kitchen gardens where they can grow and harvest some vegetables for personal use. Rice is by and large the main staple of Aurepalle diets, and in all of Andhra Pradesh rice is offered at a subsidized rate in rationed portions.

## 2. Conception and Implementation of Research



*Photo: Focus group discussion in Aurepalle; 2012*

### 2.1 Literature Review

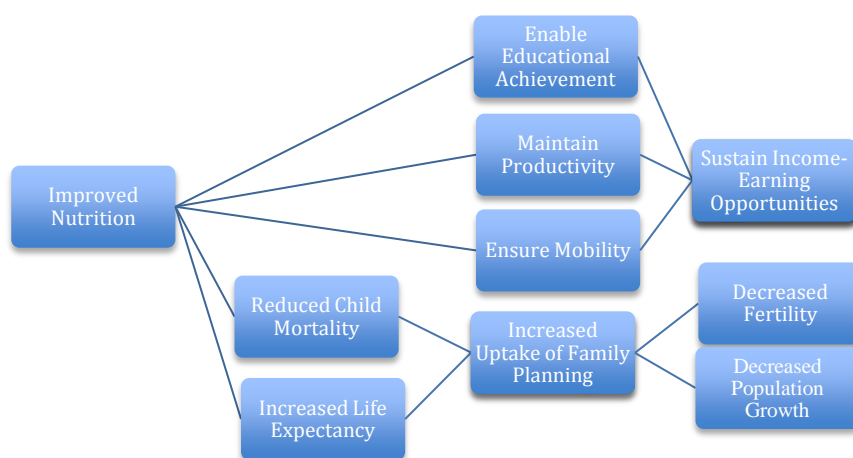
When I first arrived at ICRISAT, I was still unsure of the specifics regarding my research project, other than my research topic should fall under the category of Nutrition and Gender Studies. I therefore began reading a wide range of articles and reports to simply broaden my understanding of possible avenues for my study. I was instructed to complete an extensive literature review and charged with the task of creating an original research topic and eight-week project outline that would fill a “gap” in current research on Nutrition and Gender Development. In short, my research topic needed to be unique, not an extension of other research, and considered valuable to ICRISAT scientists. After two weeks of literature review, I was able to determine that there is much conclusive evidence correlating ICRISAT initiatives, including SHGs to increased household income and to gender development; however, no study suggested a correlation between household income, gender development and overall improved nutrition of the family or household. After deciding to conduct my research on self-help groups (SHGs) and household nutrition, I reviewed pertinent reports and data I had previously read with a specific focus on these two topics. I continued to add to my literature review throughout the duration of my research in order to add substance and lend support to my study, in addition to gaining a better understanding of any shortcomings within my own research.

Of primary significance to my research is a book I read by T.S. Walker and J.G. Ryan entitled, *Village and Household Economies in India's Semi-Arid Tropics*. The book is a compilation of all the research results found over the course of a ten-year study covering six villages. Walker and Ryan's work, conducted in Maharashtra and Andhra Pradesh, is very in-depth research covering a wide range of topics, from the labor markets to risk

assessment. Particular to my research is a large section dedicated to nutrition in the villages. The nutrition study is based out of Aurepalle and Dokur of Mahbubnaga region (Andhra Pradesh), Shirapur and Kaman of Sholapur region (Maharashtra), and Kanzara and Kinkheda of Akola region (Maharashtra), which make up the original (first-generation) Village Level Studies (VLS) of ICRISAT.

In the researchers' appraisal of nutrition in the six villages, the theory that female income has a greater impact on nutritional status than total household income, from Safilios-Rothschild (1980), is introduced. This initially sparked my interest in conducting my research on female income and household nutrition. Furthermore, the chart 2.1.1 below depicts the effects of improved nutrition as proposed by Walker and Ryan.

**Chart 2.1.1**



Another report that was very helpful to my research is Kim Chung's "The Contribution of ICRISAT's Mandate Crops to Household Food Security: A Case Study of Four Rural Villages in the Indian Semi-Arid Tropics." This was a very extensive study indicating the role mandate crops play in village life, the nutritional value of the foods consumed by the villagers, and some of the prominent characteristics of food consumption habits in the villages. Since my study has such a large focus on nutrition, Chung's research was invaluable to my understanding of nutrition in the villages. Because the information on nutrition was collected by recall and not by measuring daily caloric intake, it was imperative for me to know which foods provide the most nutritional value to the villagers. Moreover, trends in consumption habits for Aurepalle village were a part of Chung's study, giving me more background information on Aurepalle and overall nutritional status in the village.

The paper "Empowerment Through Social Capital Build-Up: Gender Dimensions in Technology Uptake," by M.C.S. Bantilan and R. Padmaja explores various aspects involved in social capital, specifically in relation to groundnut production technology. This study provided my first insight into social networking and the affect it has on empowerment of women. Specifically, the section of the report providing results from focus group discussions, that revealed how women are more likely to have increased decision-making power over the additional income they provide through their participation in social networking groups, furnished me with a better awareness of the possible ways nutrition could be affected.

"Drivers of Change: Agricultural Modernization and Women's Status in SAT India" by Alison C. Palacios, a 2010-1011 Fullbright-Nehru Grantee at ICRISAT, outlines the empowering effects of SHGs on women in rural villages as part of her study. Palacios paints a picture of the various components in agriculture-based communities either hindering or advancing the empowerment of women. Her analysis of SHGs in the original VLS villages was very insightful concerning the positive effects of SHGs on female empowerment. However,

because it was not the purpose of her research, there was no focus on household nutrition. Her paper did report Aurepalle as having the highest SHG participation rate, followed by Dokur. In comparison, the villages of Maharashtra appeared to have very little activity among SHGs. After reading her report, I decided to conduct my field research in Aurepalle and Maharashtra to make comparative analysis. Unfortunately, due to lack of time, I was unable to conduct research in Maharashtra.

Lastly, the work of R. Padmaja, M.C.S Bantilan, D. Parthasarathy and B.V.J. Gandhi in “Gender and Social Capital Mediated Technology Adoption,” helped to support the conclusions made in this study on collective action. Their report indicates that when farmers learn and adopt technology independently, the technology is not successfully adopted. However, when a group of farmers comes together to use the technology collectively, it is successfully adopted. I studied the application of this process when applied to dissemination and implementation nutritional information among SHG members, and further elaboration on this topic is provided later in this study.

These particular studies have proven to be the most influential support for my research project. I relied on the information provided in these previous investigations to guide my own. Because I came to ICRISAT unfamiliar with rural Indian farming, these studies were invaluable to me. As I completed my data collection and began my analysis of results, I continued to return to my literature review to provide me with a better awareness of nutrition and information sharing in the region.

## ***2.2 Hypotheses and Objectives***

Based on my literature review, the following overarching hypothesis was formed: **Female participation in SHGs will enhance the nutritional status of the household.** The following three sub-hypotheses branch off of this main one:

1. Involvement in SHGs will increase the consumption frequency of healthy, nutritious foods in household diets.
2. Anthropometric measurements taken for all households will show an increase in “normal” ranges of nutritional status among SHG households.
3. Participation in SHGs provides more access to information on nutrition.

Based upon the broad hypothesis of the study, this general objective was developed: **Does participation in SHGs improve the nutritional status of the household?** From the sub-hypotheses proposed above, the following sub-objectives logically include:

1. In SHG households, are more nutritious foods consumed more consistently compared to non-SHG households?
2. Does anthropometric data quantitatively show an increase in nutritional status for SHG households compared to Non-SHG households?
3. Do SHGs provide information to members on accessible resources that can improve nutritional status?

## ***2.3 Methodology***

The village selected for this study was Aurepalle. This decision was made because of its proximity to ICRISAT’s campus and the high SHG participation rate. Also, because it is one of the original VLS villages, there is accessible data for Aurepalle dating back to 1974 when ICRISAT studies began. This allowed for a more in-depth understanding of how food habits may have changed in the village, if such an analysis was needed.

There were two sources used for the analysis of data: personal field research and previously collected VLS data. The field research was comprised of two focus group discussions and individual interviews. One of the focus group discussions was with SHG members only, the other was with Non-SHG members. A discussion guide had been previously created in order to direct questions and conversation. The primary focus of the guide was on household nutrition and food consumption habits, although some questions about SHG involvement (or lack of) was also included.

The individual interviews also involved women participating in SHGs and women who are not. As will be explained later, there was a limited number of women available to interview, resulting in just 8 SHG member and 6 Non-SHG member interviews for a total of 14 interviews. There was no preference given to caste when selecting interviewees. However, landholding was taken into some consideration, only so the results were not unintentionally skewed because of a dramatic imbalance of farm size and, therefore, income or availability of home-produced food for household consumption. For the individual interviews, I developed an extensive questionnaire, which served to gather more information on SHGs, nutrition and information sharing. All information gathered from the interviews was based on recall of the interview participants. The full set of questions and responses given for both the focus group discussions and the interviews can be found in the appendix.

An analysis of the VLS data for Aurepalle is included in order to add quantitative data to support data collected in the field. From the anthropometric measurements taken for the VLS households, body mass index (BMI) was calculated for all persons over 18 years old and divided into the categories of Severely Thin, Thin, Normal, Pre-Obese and Obese based on the standards put forth by the World Health Organization. Also, for children (5 years old and under), height, weight and arm circumference measurements were compared to the Indian National Standards. Both adults and children were divided into two groups for comparison based upon the family's involvement in SHGs.

Data collection of in-house discussions and extensive literature review were imperative to my study. Because of my lack of experience and background knowledge in this field of research, I relied heavily on previous reports to support or point out shortfalls in my own study. In-house discussion between my mentors and me were also significant to my study's validity and success. MIP personnel offered advice and helped to guide my research project.

## ***2.4 Limitations***

The main limitation of this research project was time. Because of the short 8-week period for my internship, there was not enough time to complete an extensive in-depth study on the connection between SHGs and household nutritional status. One of the effects of the limitation of time was the inability to compare multiple villages. Only one village could be selected, and so it was necessary to choose a village where SHGs were well established and where there was a high participation rate. Unfortunately, this meant a comparison to a village with a lower participation rate was not possible.

A second limitation was a seemingly double-edged sword – Aurepalle was the perfect village to study and the least perfect. In short, because a village with a high participation rate was needed, Aurepalle, the VLS village with the highest participation rate, was selected. However, because of the heavy involvement in SHGs, it was very difficult to find Non-SHG members to participate in the focus groups and interviews. Moreover, because of the time period in which the study was conducted, many women were very busy with fieldwork and did not have time to conduct interviews. Women were reluctant to spend time during the day to answer questions,

which left only early morning and late evening to hold interviews. Because there was only time for a short visit to Aurepalle, this severely decreased the number of interviews held. It should also be noted that because of the small sample size, the percentages given in this study are a percentage of the total number of interviews conducted. Therefore, the responses from SHG households are taken out of the total number of interviewees.

Another study limitation was the language barrier between the respondents and myself. Although the village reporter served as a translator to ask the questions and interpret responses, authentic communication still proved difficult. This was especially evident when I would need further clarification or elaboration on a statement made by an individual. It was also complicated to explain to the village reporter any additional secondary questions or clarifications I needed during the interviews and focus group discussions. Furthermore, certain words or comments did not translate easily from one language to the other. In addition to these limitations individually, all of these barriers together increased the amount of time the interviews took which discouraged some prospective respondents from participating in an interview because of the time factor.

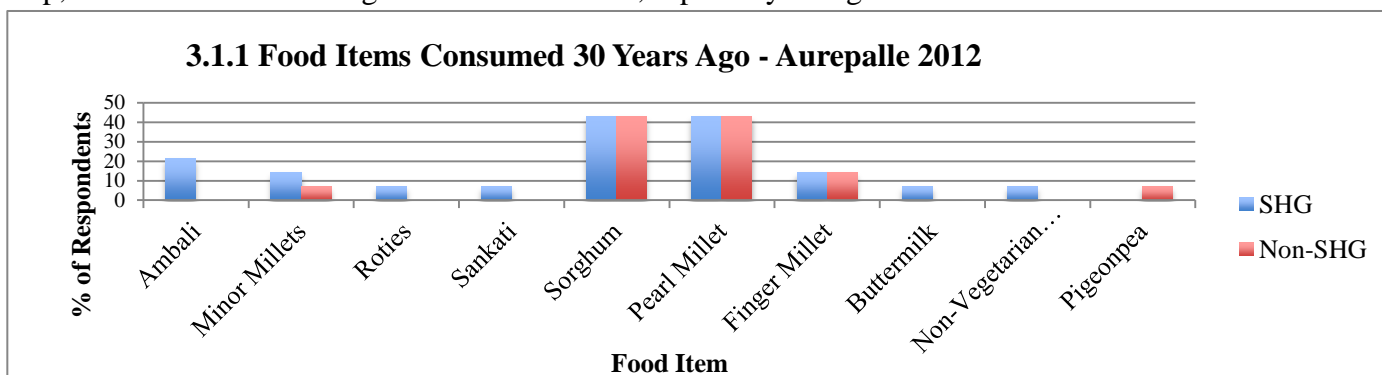
### 3. Results



*Photo: Women of Aurepalle Village collecting water for the day from an ICRISAT well; Aurepalle 2012*

#### 3.1 Nutrition

In order to have a better grasp of nutrition in Aurepalle village households today, it is important to understand how food habits have changed over the past generation. Thus, let's begin with a comparison of food habits 30 years ago and food habits today. Pearl millet and sorghum, both ICRISAT mandate crops, were reported by the largest percentage of respondents as being more commonly consumed 30 years ago, followed by finger millet. The reason finger millet is listed separately from minor millets is because it used to be an ICRISAT mandate crop, and is known for its high nutritional content, especially as a good source of calcium.





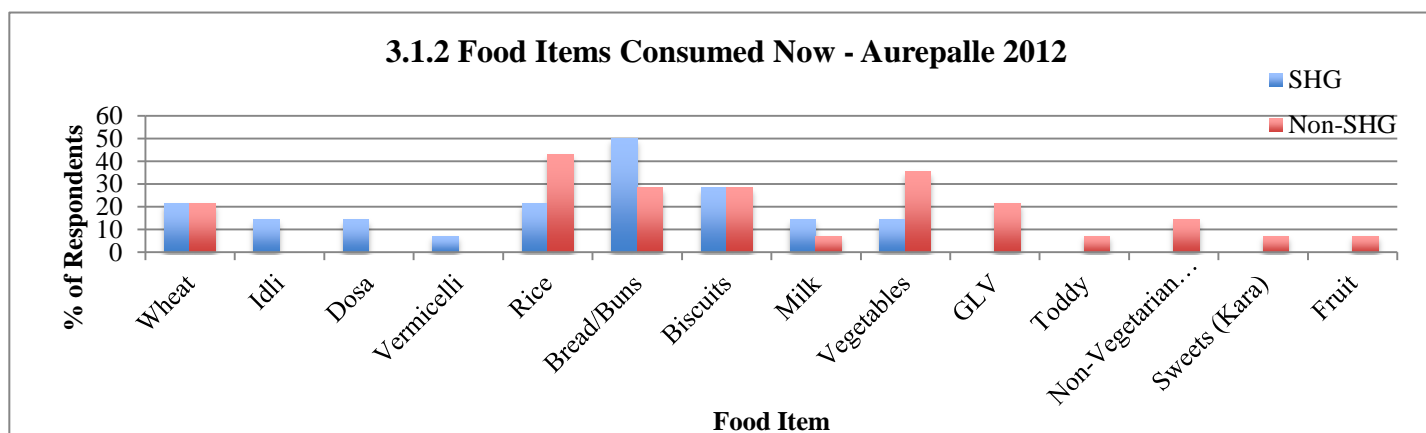


Chart 3.1.2 shows that in addition to the trends toward consuming more vegetables, green leafy vegetables (GLV), and non-vegetarian food, there is also an increase in the consumption of processed and ready-made foods. Over the last 30 years consumption of processed food, i.e. buns/breads, biscuits, and kara (local terminology for sweets), has risen primarily because of the social popularity of these products. Children especially prefer to eat these processed items to traditional foods, despite the change in nutritional value of the foods.

The rise in consumption of wheat flour also plays a part in the change in nutritional intake. Because it is a ready-made product, it decreases the amount of time it takes to cook. This change in food habits is an example of the trend toward more timesaving methods of cooking. This follows the pattern of household technology adoption, where items such as grinders, mixers, gas connections, etc. have decreased the time spent cooking meals for the family (Palacios, 2012). According to focus group discussions, a primary change in food habits in recent years is the cooking time. Now women can cook two times a day, thus eating fresher food on a daily basis, as opposed to the previous habit of cooking once a day. While this does serve to cut down on the time women spend in the kitchen, if ready-made food items like wheat flour continue to take preference over traditional cereal grains, such as sorghum or pearl millet, then there could be cause for concern about potentially decreased nutritional value in diets.

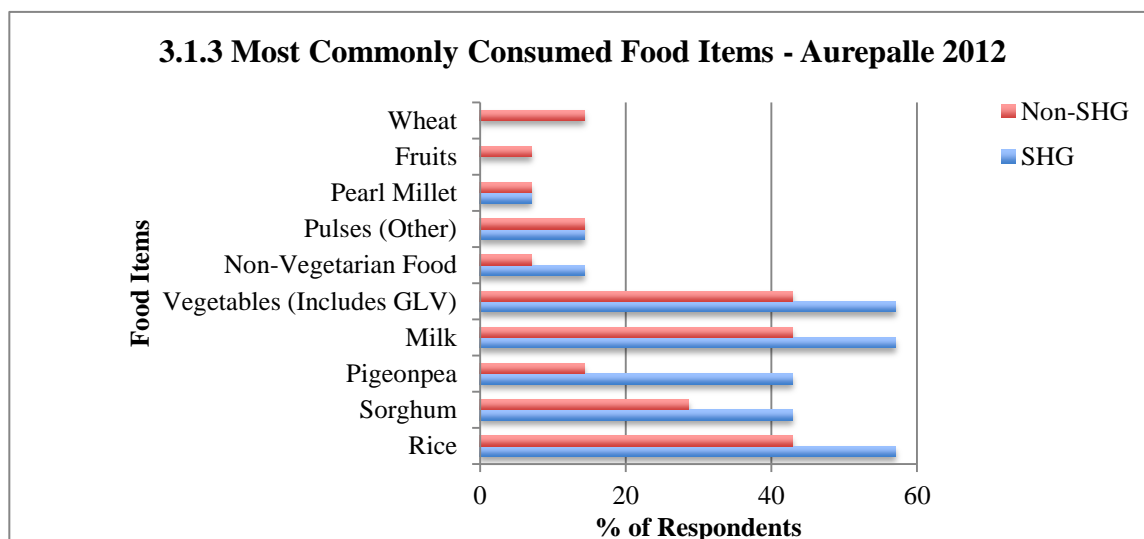
According to Kim Chung's study "The Contribution of ICRISAT's Mandate Crops to Household Food Security," rice is a staple of not only Aurepalle diets, but also Andhra Pradesh diets as a whole (Chung, 1998). Evidence from this study maintains that Chung's findings still hold true when it comes to rice as the principal food item of villager's meals. As seen in Chart 3.1.2, a large majority of respondents listed rice as one of the foods more commonly consumed now compared to 30 years ago.

The preference of rice to sorghum can have debilitating consequences for villager's nutritional intake, as it takes four times the amount of rice to obtain the same amount of iron found in sorghum. Rice in Aurepalle is rationed and provided at a subsidized rate. This explains why focus group discussions reported that rice is favored over sorghum. However, rationed rice does not adequately meet daily consumption needs of the family, so additional rice must be purchased, and sorghum is less expensive than unsubsidized rice. The fact that rice is less nutritious than sorghum and costs more to supplement the diet yet remains the staple of the Aurepalle villagers' diets may indicate a lack of knowledge regarding nutritional value of consumed foods.

Rice has not replaced the other cereals completely; sorghum is still commonly consumed in the household diet. Pearl millet also remains one of the more commonly consumed food items, although less common than sorghum and rice. As Chart 3.1.3 indicates, rice, milk and vegetables, including GLV, had the highest



percentage of responses from both SHG and Non-SHG participants for the most commonly consumed household food items. These items are followed by sorghum and pigeonpea.

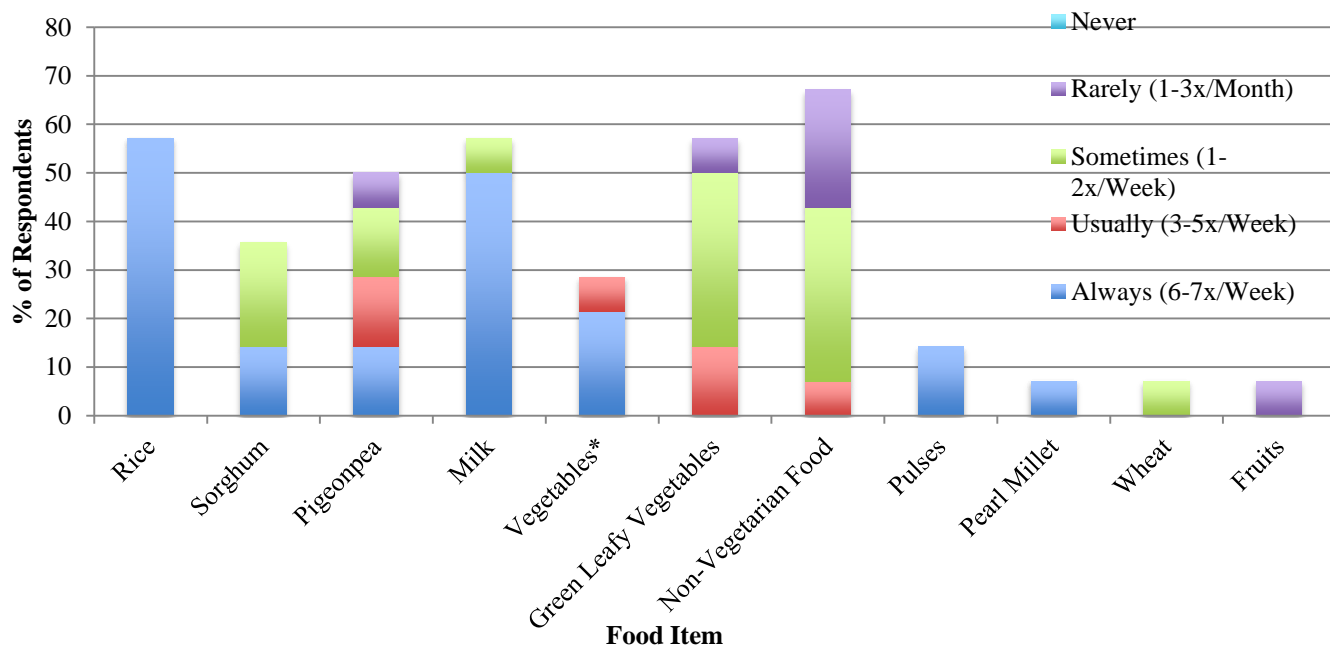


This chart primarily serves to provide the range of food items consumed within the household. While it is certainly understood the food items listed may not be the only food items consumed in the household, those listed are eaten frequently enough to be considered commonly consumed. Unfortunately, focus group discussions revealed that, despite the diversity of dietary foods, women generally feel weaker and unable to work as long or hard as they used to. The women attribute the reason to a change in crop quality.

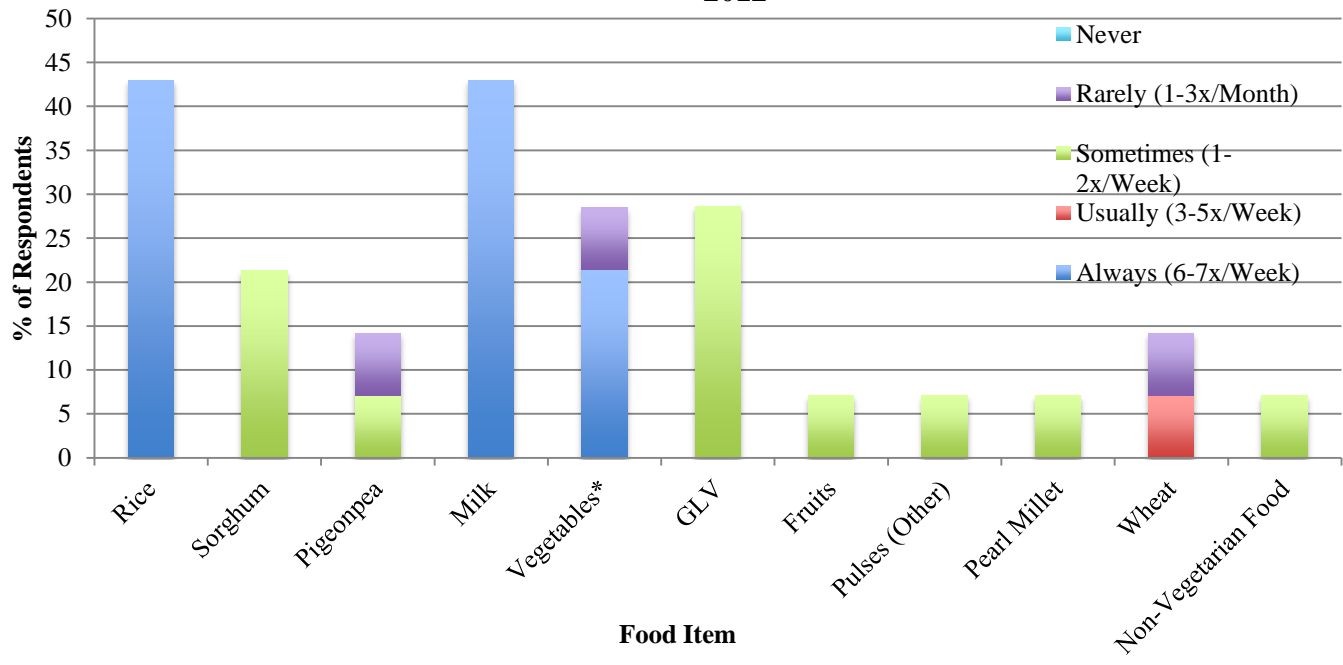
Growing local varieties of foods and using organic methods of farming were once common in Aurepalle; however recent hybrid crops and farming changes have been adopted. One specific example is the growing of BPT (formerly known as samba masuri) rice, which is currently one of the most commonly grown breeds of rice in Aurepalle (according to focus group discussions). The women claim that this smaller grain-sized rice is less nutritious than previously grown rice. Other claims suggest that the chemicals used to increase crop production cause a decrease in the nutritional value of the food harvested. Discussion group participants remarked that farmers today are more concerned with increasing profits, which is why these methods were adopted in the first place. This information means that if the crops are, in fact, a lower quality, then farmers will not be inclined to switch crops for a more nutritional product. If the crops are of the same quality, then the claims made by these women may also indicate a lack of knowledge regarding true nutritional value and/or accurate knowledge regarding adoption of technology.

It is also important to consider the frequency of specific food item consumption within households. Clearly indicated by both SHG and Non-SHG respondents alike, all respondents reported rice as a food always consumed (6-7x/week), and all Non-SHG respondents listed milk as falling into this category as well. One possible explanation for Non-SHG mild consumption was provided in the focus group discussion with SHG members. It was stated that many SGH participants will use portions of their loans to purchase dairy animals, such as buffalos or dairy cows, and then sell the milk for a profit, thus reducing their family's consumption of milk.

**3.1.4a Frequency of Food Item Consumption in SHG Households - Aurepalle 2012**



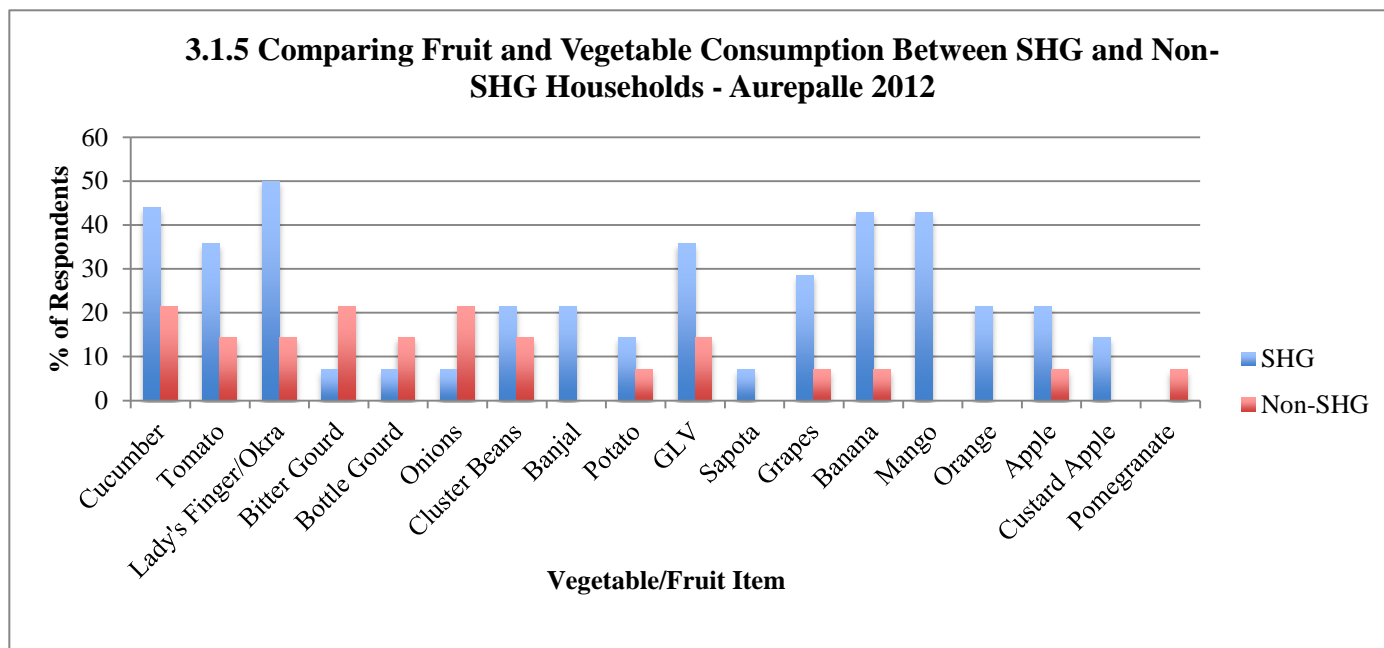
**3.1.4b Frequency of Food Items Consumed in Non-SHG Households - Aurepalle 2012**



Intake of sorghum, pigeonpea, vegetables, green leafy vegetables (GLV), non-vegetarian food and pulses (other) is more frequent in SHG households. Chart 3.1.4b depicts an equally wide variety of food items as found in SHG respondents, but the rate the items are consumed is much lower among Non-SHG households. Among Non-SHG households, however, there was a higher consumption of fruit and wheat. The most important

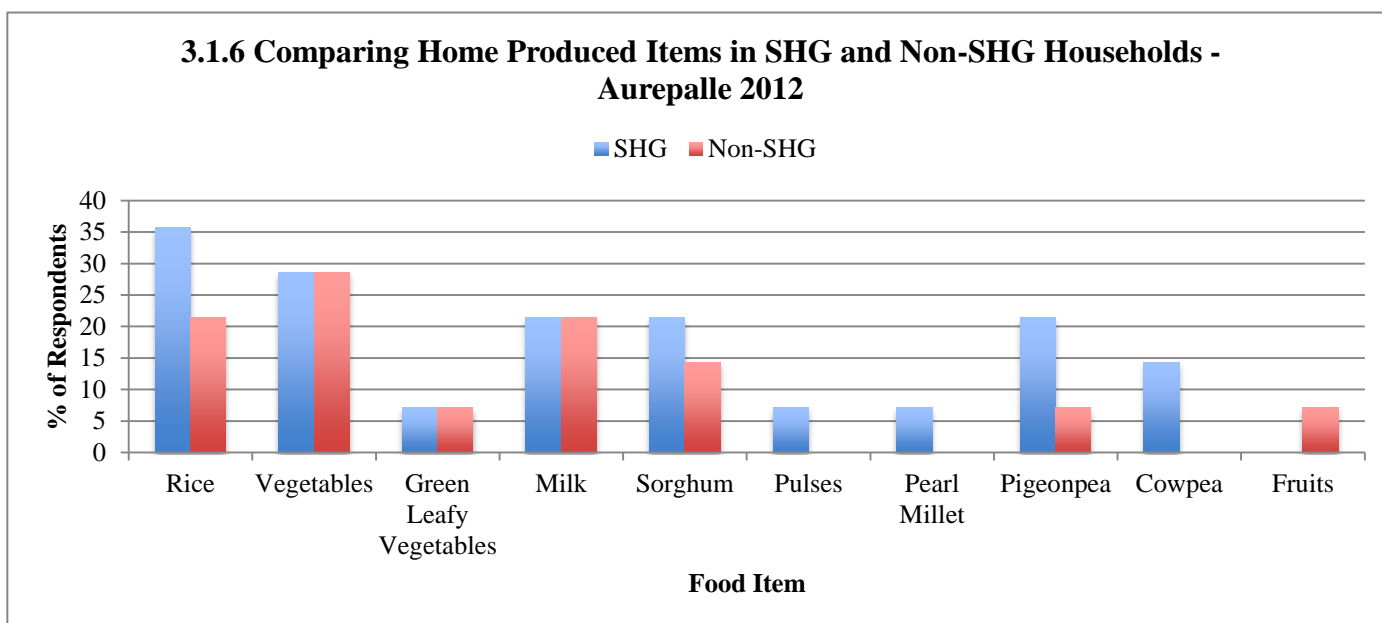
information to be gathered from this data, though, is the much higher consumption frequency of GLV in SHG households.

The majority of respondents who specifically listed GLV as one of the commonly consumed types of vegetables in the household were involved in SHGs. Furthermore, the respondents who eat a wider variety of fruit and vegetables are SHG members; the only food item listed by a Non-SHG member and not reported by an SHG member is pomegranate. Overall, though, when it comes to fruit there are a much higher percentage of SHG participants listing a wide range of produce consumed by the household. This is true especially for the mango, which has one of the higher total response rates, with all respondents belonging to SHGs. For all replies, only bitter gourd, bottle gourd and onions received a higher percentage of Non-SHG participant responses.



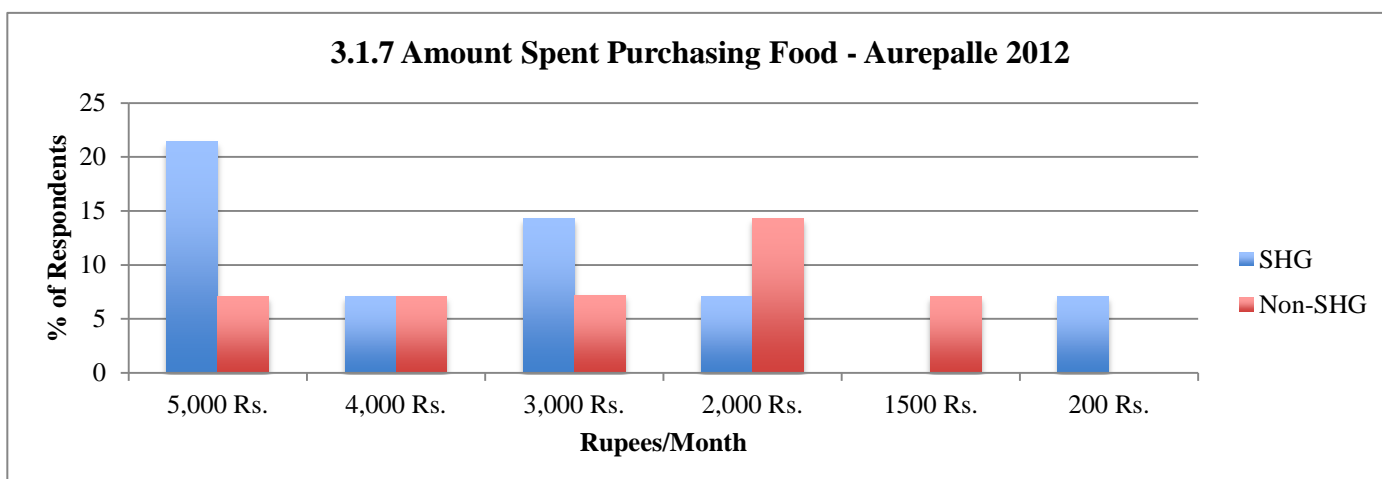
When looking at consumption habits, it is very important to consider the types of home-produced food. If food is home-produced, then it can be assumed the household will likely consume the food. This is not always the case, though, as was pointed out during focus group discussions. Specifically, focus group respondents explained that buffalo and dairy cows are purchased so that their milk could be sold instead of consumed by the household. Some milk would be set aside family consumption, but not an adequate amount for nutritional needs.

Despite this exception, though, it can be assumed that home-production will increase the household consumption of that particular crop. Furthermore, home-production of food saves money compared to purchasing food from a farmer who is trying to make a profit. This scenario equates to that of a farmer selling for profit a cash crop of cotton to villagers who need cotton but do not grow it. The chart below is a comparison of home production between SHG and Non-SHG households. Rice production received the highest percentage of SHG respondents, followed by vegetable production. Among the Non-SHG participants, vegetables received the highest number of responses, followed by equal responses for rice and milk production.



One of the reasons for the high response rate for home production of vegetables is that in Aurepalle nearly all households have a small outdoor kitchen garden where certain food items, like vegetables, are produced and harvested for household consumption.

From interviews with the villagers, I found that the majority of the respondents involved in SHGs home-produce at least half of their consumed food. The most common response from Non-SHG participants was “Almost None,” indicating their need to purchase food. These results may lead to the assumption that Non-SHG households spend more money purchasing food because they don’t home-produce as much. Upon taking a closer look, though, it seems this assumption is incorrect. Most SHG respondents spend at least 3,000 Rs a month purchasing food for the household, and the most common figure reported is 5,000 Rs a month for that same group. The most common response for Non-SHG members is 2,000 Rs a month.

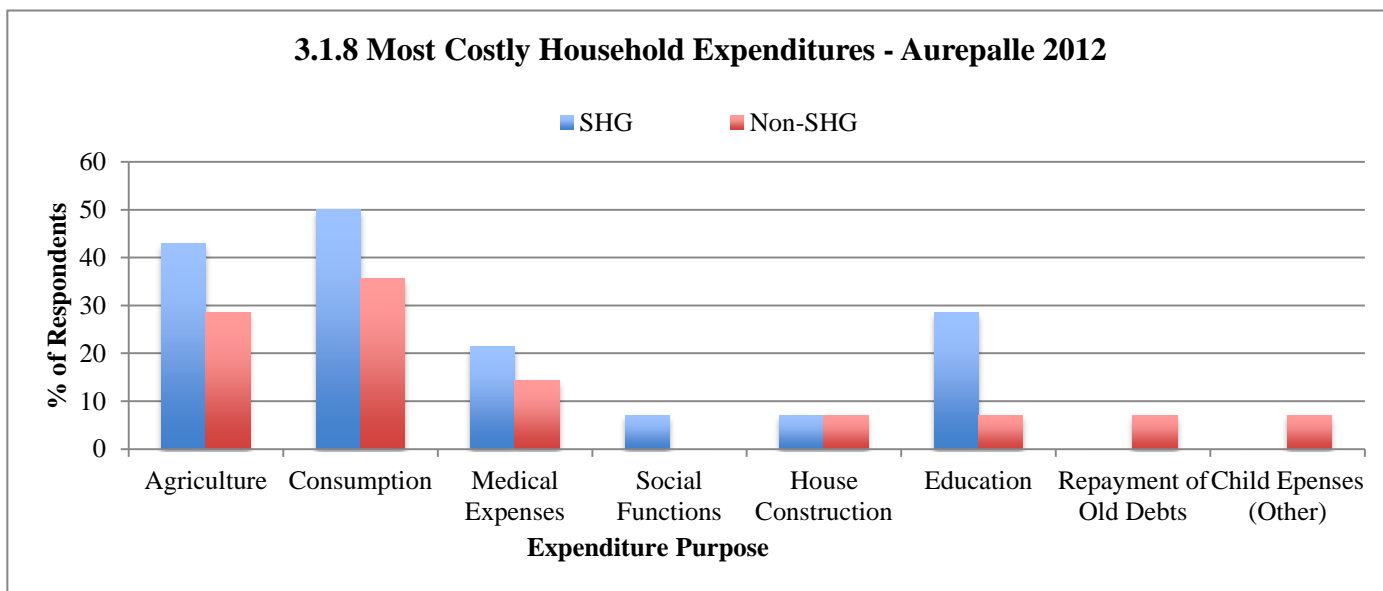


*\*It should be noted that the response of 200 Rs/Month is listed because it was received as a response, but is believed to be inaccurate and a result of misunderstanding the question.*

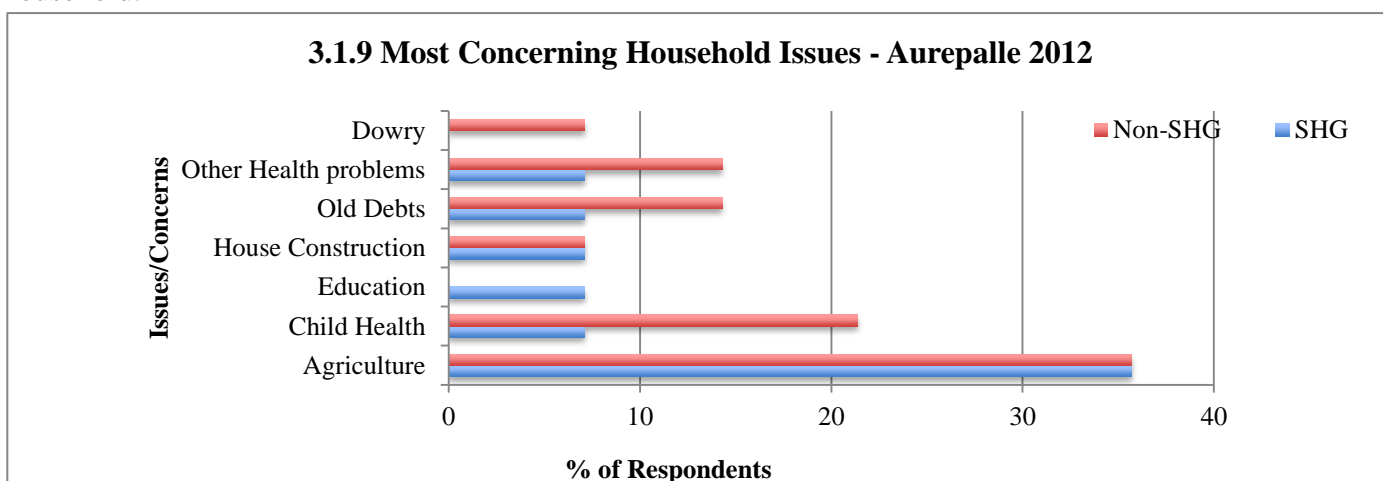
This is a very interesting finding as it may indicate an inability on the part of Non-SHG members to purchase food. The reason for this inability was not determined by this study; however, speculation has led to two possible conclusions, although there may be more possible explanations. One potential reason may be the fact

that the Non-SHG participants aren't involved in SHGs because they are too poor. Another answer may be that the SHG loans allow for more money to be spent on buying food. The loan may not go directly toward household consumption, but may indirectly allow more money to be spent on food purchases.

This is certainly plausible rationale, especially when considering household expenditures. For both SHG and Non-SHG respondents, consumption was listed as one of the most costly household expenditures, followed by agriculture. It is important to understand, however, that the data displayed on the graph does not represent what the most costly expenditures are. Consumption, then, may not necessarily be *the* most costly input for the household, but it certainly is the most common one.



This graph also serves to emphasize the disconnect between the cost of consumption and the amount of concern for nutrition within a household. It would seem reasonable to assume that, because of the high cost of consumption for a household, nutrition may be of high concern. However, this is not the case at all; villagers altogether seem rather uninterested in nutritional status. The most prevalent concern given by both groups was agriculture; neither consumption nor nutrition was even significant enough to be listed as problems for the household.



### 3.2 Anthropometric Measurements

Anthropometric measurements are a part of the hypotheses and objectives in order to qualitatively support the results and conclusions gathered during this study. However, because of the severe limitations due to the sample size of the study, the measurements do not accurately portray the results found. Nonetheless, because anthropometric data was analyzed as a part of this research project, the results of the analysis are provided. However, when conclusions for this study were derived, anthropometric data was not taken into consideration because of the skewed results.

First, Body Mass Index (BMI) was calculated and analyzed. The results were then divided into categories as given by the World Health Organization (WHO).

#### 3.2.1a BMI Classification of SHG Households - Aurepalle 2012



#### 3.2.1b BMI Classification of Non-SHG Households - Aurepalle 2012



**Table 3.2.1 BMI Classification – Aurepalle 2012**

| <b>BMI Classification</b> | <b>SHG</b> | <b>Non-SHG</b> |
|---------------------------|------------|----------------|
| Severely Thin             | 12         | 2              |
| Thin                      | 27         | 10             |
| Normal                    | 65         | 16             |
| Pre-Obese                 | 11         | 0              |
| Obese                     | 1          | 0              |
| <b>Total</b>              | <b>116</b> | <b>28</b>      |

The only noticeable difference between SHG and Non-SHG members is that only SHG members fall above the “Normal” ranges for BMI. However, because of the sample size differences, this observation is considered negligible.

There is even less data available for children (age 5 and under). Below, Table 3.2.2a and 3.2.2b give the results of the comparison of children whose families are involved in SHGs and those who are not. The results here, though, should not be considered valuable. As stated before, they are only given as part of the results because there was an intention in this study to use anthropometric data.

**Table 3.2.2a Anthropometric Data for SHG Household Children – Aurepalle 2012**

| <b>Measurement</b> | <b>Normal</b> | <b>Mild</b> | <b>Moderate</b> | <b>Severe</b> |
|--------------------|---------------|-------------|-----------------|---------------|
| Height             | 1             | 2           | 1               | 1             |
| Weight             | 1             | 2           | 1               | 1             |
| Arm Circumference  | 0             | 2           | 3               | 0             |

**Table 3.2.2b Anthropometric Data for Non-SHG Household Children – Aurepalle 2012**

| <b>Measurement</b> | <b>Normal</b> | <b>Mild</b> | <b>Moderate</b> | <b>Severe</b> |
|--------------------|---------------|-------------|-----------------|---------------|
| Height             | 0             | 1           | 2               | 0             |
| Weight             | 1             | 2           | 0               | 0             |
| Arm Circumference  | 0             | 3           | 0               | 0             |

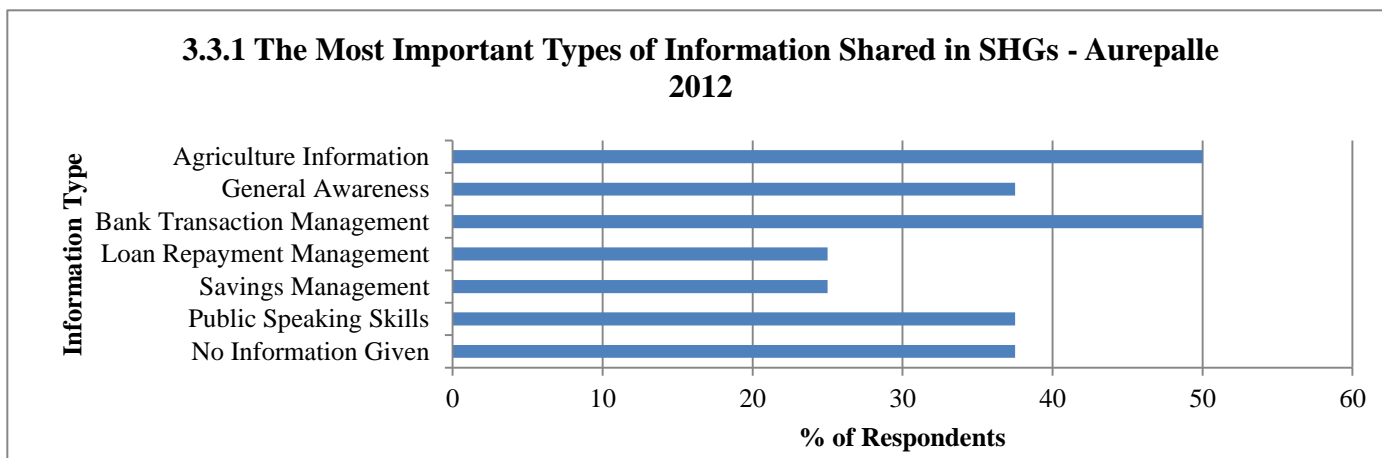
### **3.3 Information Sharing**

When considering the impact of SHGs on household nutrition, a vital factor which must be taken into consideration is information sharing. If information is not shared, either among SHG members or among villagers in general, then no affect on nutritional status will be attained. When the objectives and hypotheses of this study were first being formulated, information sharing was not one of the primary concerns. However, over



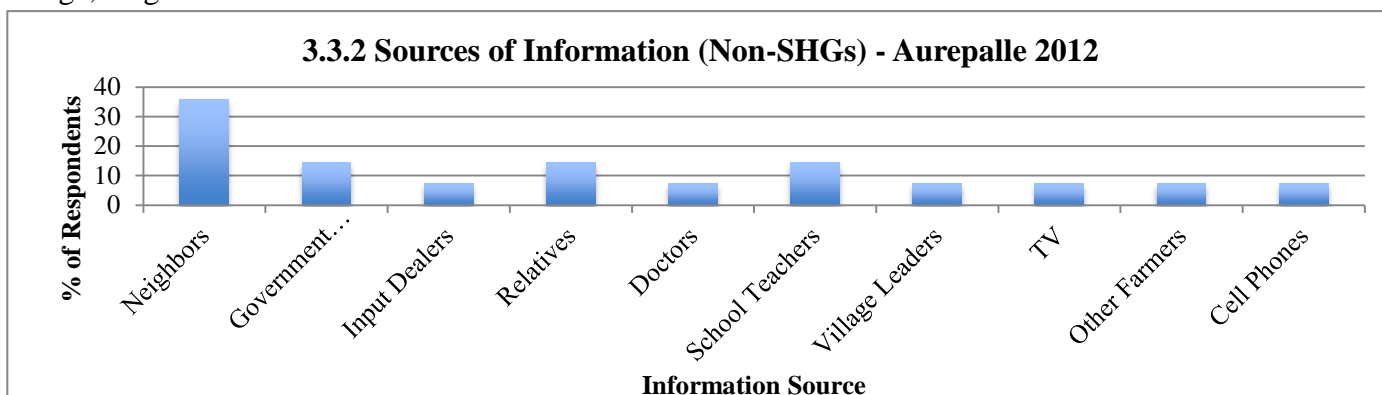
the course of this study it was realized how pivotal information sharing is if improved household nutritional status is to be achieved.

When comparing information sharing between SHG and Non-SHG members, it is beneficial to first have an understanding of what types of information are being shared in SHGs that Non-SHG members are likely not privy to. The chart below provides the most important types of information shared within the SHGs as reported by SHG members, with information on agriculture and bank transaction management being the most common replies. The explanation for the high number of responses in the “No Information Given” category is that some respondents had not been involved in SHGs for a long enough time to gather information from the monthly meetings.

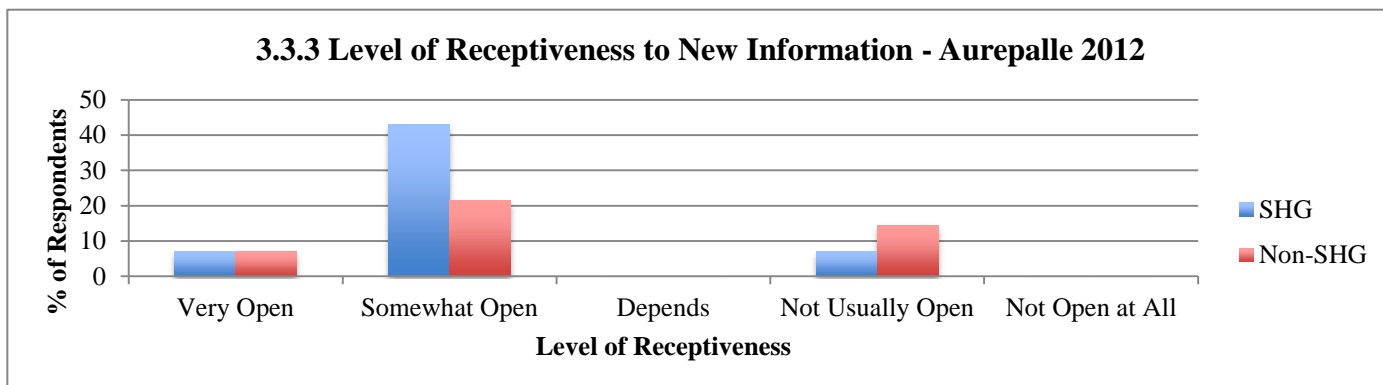


Interestingly, there were no responses in which nutrition or nutrition-related information was reported to be shared among SHGs. It is understood that the purpose of SHGs does not include nutrition development. Just as interesting, government schemes directed at SHG members, such as gas connections, student scholarships and old-age (60 years+) pensions are not directly related to the mission of SHGs either but are indeed topics of conversation. While these schemes are not necessarily reported as types of information shared, the sharing of this information among SHG members does demonstrate how SHGs can be used as venues for alternative objectives, such as sharing nutritional information.

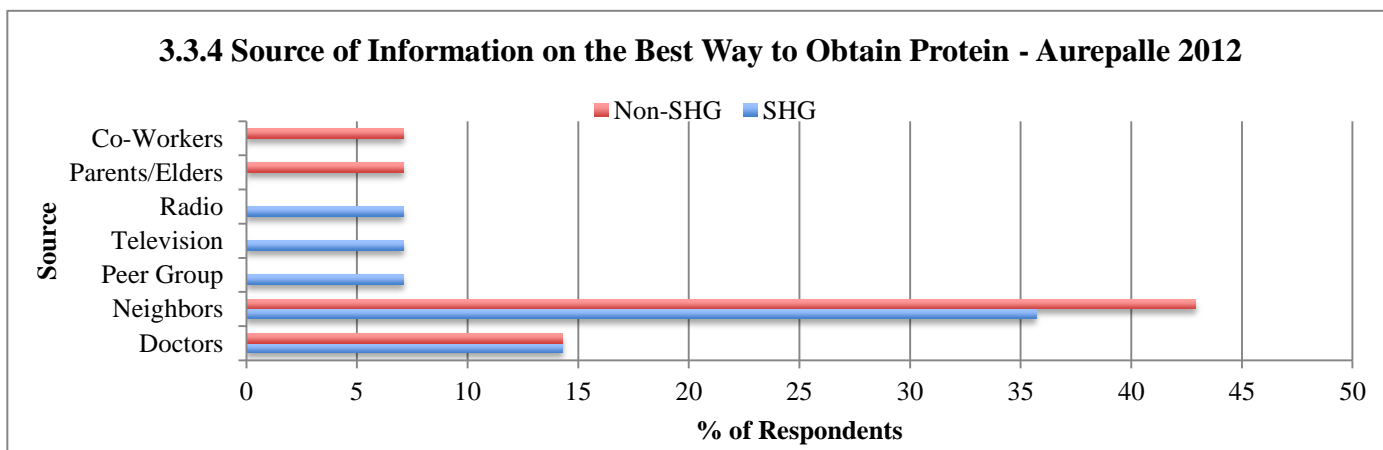
Because Non-SHG members do not have the benefit of receiving information shared in SHGs, it is necessary to discern where they might gather information. Chart 3.3.2, indicates that neighbors are the primary source of information sharing. This holds true in SHG households as well since the focus group reported that other women are a common source of information. As the chart denotes, despite the fact that a doctor is present in the village, neighbors are still one of the most common sources of information.



One of the most striking differences between SHG and Non-SHG households when it comes to information sharing is the level of receptiveness to new information. By and large, SHG members are much more open to receiving new information than Non-SHG members. This is no doubt an effect of SHGs on the empowerment of women. Because women are more confident in themselves they are more confident in their ability to adopt and understand new information. Also, SHGs most likely play a role in how well the information is accepted. It is probable that involvement in SHGs has helped to prove new information as valuable and reliable, which makes the idea of new information less daunting and more desirable. The data on receptiveness levels can be seen below in Chart 3.3.3.



An example of successful information sharing among SHG members is as follows: When discussing with interviewees the best ways to obtain protein, there was a mix of answers, non-vegetarian food and pulses were the most common answers given. Just as important as the accurate responses given in this discussion is where the information was obtained. The following graph reveals this interesting finding.



Once again, information is overwhelmingly received via neighbors. Nearly all respondents listed that the information they received regarding obtaining protein came from their neighbors. None of the villagers were able to identify a pulses/cereals combination, which is the only way to obtain all the necessary amino acids without consuming non-vegetarian food (Chung, 1998). Doctors were the next highest response as sources of information; however, the percentage of persons who listed doctors as the source is significantly lower than the percentages for neighbors. Overall, it appears that neighbors are the main conduits of information sharing among villagers.

Furthermore, not only is information shared among neighbors but also adopted collectively. It was garnered from the interviews that information may be shared among neighbors, but no action will be taken to adopt or

test the new information until other neighbors do as well. This process of collective action and adoption is similar to the process of groundnut production technology adoption found in “Gender and Social Capital Mediated Technology Adoption,” by R. Padmaja, M.C.S. Bantilan, D. Parthasarathy and B.V.J. Gandhi (Padmaja et al., 2006).

Finally, all of the respondents in SHGs felt content with the amount of information shared in their groups. However, all of the respondents also agreed that new information and information sharing was beneficial. The inferences of these findings are that the women respondents do not necessarily know what type of new information to search for, but when new information comes to them, they are willing to receive it and understand its usefulness. That said, it is clear that villagers still do not know what they should be learning about; they simply wait until information comes their way before they understand its significance.

#### 4. Conclusions and Recommendations



*Photo: Iswarya Jangayya, 1.5 years old, smiling for a picture during her mother's interview; Aurepalle, 2012*

##### 4.1 Conclusions

At first, it was thought that this study would indicate that an increase in female income would invariably lead to an increase in household nutritional status. While the theory that income in general increases nutritional status had already been disproved, there was a strong belief that female income would be an influential factor in the level of nutritional intake. However, this study did not necessarily support such a theory. Though the limitations of this study may construe the evidence found, this study indicates it is not the *income* of the women in the household, but the *social opportunities* of the females. At first, the research was looking at one aspect of female nature—the instinct to nurture one's children and family—and looked past another very important feature—the female inclination to talk with each other! This finding will be more thoroughly discussed later in this section.

##### *Nutrition*

One of the primary conclusions drawn from the nutritional aspect of this study is a concern over nutritional quality in the village. This may mean there is an incorrect adoption of technologies like herbicides, pesticides and fertilizers and that are negatively affecting the nutritional value of the crops. However, this is unlikely. What is more conceivable is a general lack of knowledge when it comes to the nutritional value of the crops, leading to incorrect assumptions on the part of the villagers. To bring back the specific example given by the villagers of BPT rice, they are judging the nutritional content of the rice by the appearance of its grain. This indicates that the villagers do not know what constitutes a nutritional food.

There is also an obvious rise in the consumption of ready-made products and processed goods, such as wheat flour, buns/breads, biscuits, etc. These foods are less time consuming and more socially popular. Consumption of these foods is a modern trend, and their rise in popularity is a result of the social-status perceptions many households desire to display, despite the decrease nutritional value of these processed foods. Other changes in food habits include the rise in consumption of rice, milk, and vegetables, particularly green leafy vegetables. With the establishment of rice as the staple of household diets in Aurepalle, there has been a decrease in consumption of other cereal grains, namely sorghum and pearl millet. It was also noted, though, that among SHG households sorghum, pigeonpea and other pulses, pearl millet, non-vegetarian food and green leafy vegetables are more frequently consumed than in Non-SHG households, along with a less frequent consumption of wheat.

The most important finding of this research has been the general lack of concern over nutritional status. Despite women feeling weaker and attributing this to a change in food quality, none of the women felt that nutrition was something to be worried about. This very strongly indicates that women, both SHG and Non-SHG members, do not understand the importance of nutrition.

#### *Anthropometric Measurements*

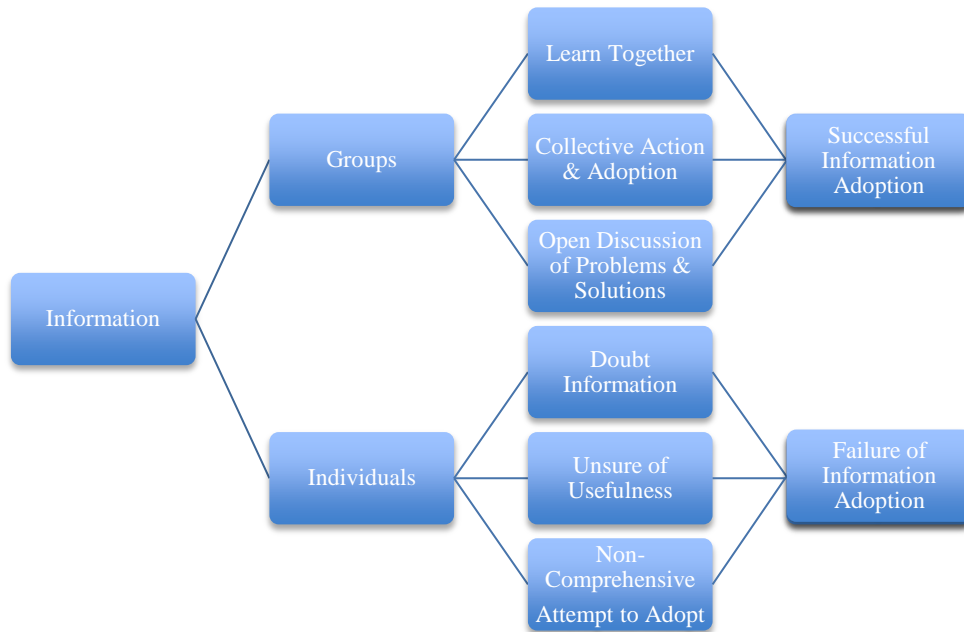
Because of the skewed results for the anthropometric data, it is impossible to make any informed conclusions based on the measurements taken for the VLS sample in ICRISAT. Nonetheless, it is important to take note of the benefits of including anthropometric data in a study such as this one. Although recall is important because it offers a more personal connection with the subjects and provides new insights for the research, qualitative data can offer indisputable evidence to support the conclusions made. It is unfortunate that the location and duration of this particular study did not allow for an in-depth analysis.

#### *Information Sharing*

Overall, when it comes to information sharing, SHG members tend to be more open to information. While it is not directly proven, this is more likely an effect of SHG involvement. It was also noted that the women in the village do not seek information regarding nutritional status out. While this is in part due to the lack of concern over nutritional status villagers have, it may additionally stem from not knowing what information is important, and, even more so, *why* that information is significant.

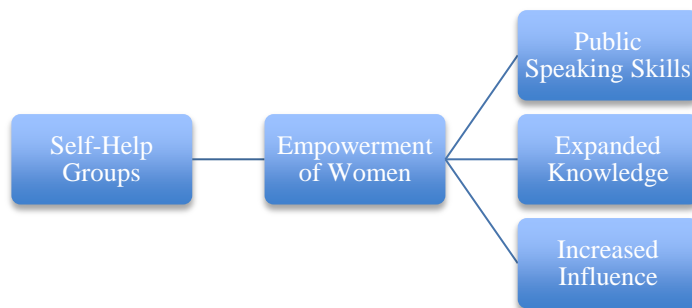
It is also very apparent that communication with neighbors is the primary way information is shared among villagers. Moreover, neighbors will take collective action when adopting new information. In order for information to be adopted and spread among the villagers, therefore, influential neighbors must be targeted by organizations wishing to disseminate important nutritional information. The following charts go through the steps of information sharing and adoption.

**Chart 4.1.1**



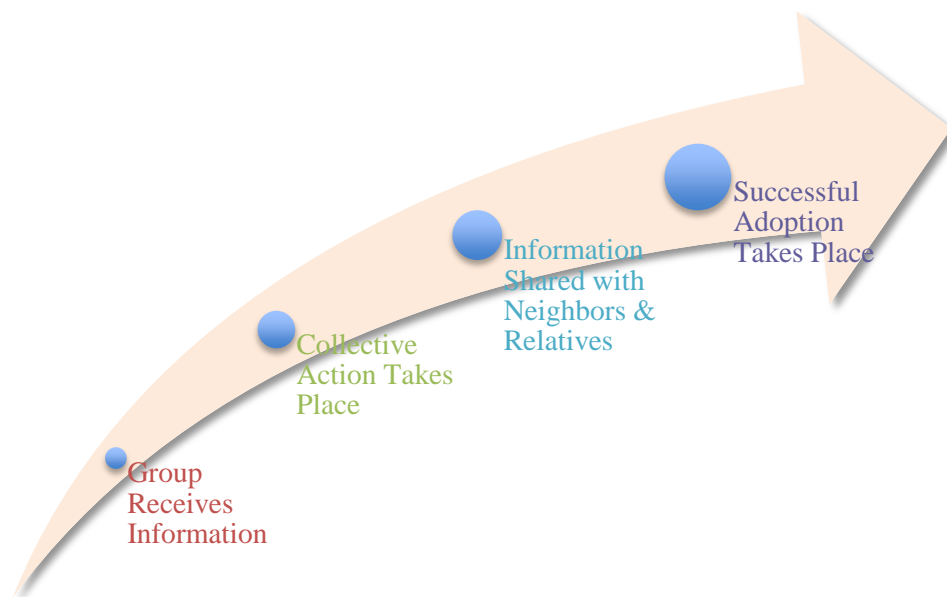
The chart above goes through the two possible courses of information sharing and adoption. If the information is given to an individual, then the individual will be more likely to unsuccessfully adopt the information. On the other hand, if information is shared with a group of people, then collective action can take place and successful adoption is more likely to occur. Groups, when working together, are able to face and solve problems together and share their successes with other group members. There is a network to fall back on if a problem arises. This enables a group to learn and succeed together, and then share their success with other groups of interested persons.

**Chart 4.1.2**



This chart simply illustrates the empowering effect of SHG involvement on women. Public speaking skills, expanded knowledge and increased influence are not the only results of SHG empowerment, however, when it comes to information sharing, they become some of the most important ones. These three things allow SHG members to comprehensively receive and share the information given to the SHG.

Chart 4.1.3



From the former two charts, this model can be assumed to lead to successful adoption. The SHG receives new information. Because there is a close network within the group for the members to discuss with and rely on, collective action takes place. Because SHG members are empowered with the ability to speak publicly, have an understanding and receptiveness to new information, and are influential females in the community, they are able to effectively share the new information with neighbors and relatives who may not necessarily be in SHGs. Also, one SHG would be able to share the information with another SHG, increasing the spread of information. Then, because of the large number of people who are collectively acting upon the new information, successful adoption takes place.

I like to call this a “Women Will Talk” model, because it is a manifestation of one of the most basic aspects of female relationships. When women who share common interests gather, they discuss matters important to them. Naturally, then, SHG members share information with their SHGs and also with their neighbors, whether they are SHG members or not. This is just basic understanding of how information is spread among villagers, but the potential of such a strong network of communication is unimaginable. The key is not just giving the information to women, but giving the information to women who *will* talk.

## 4.2 Recommendations

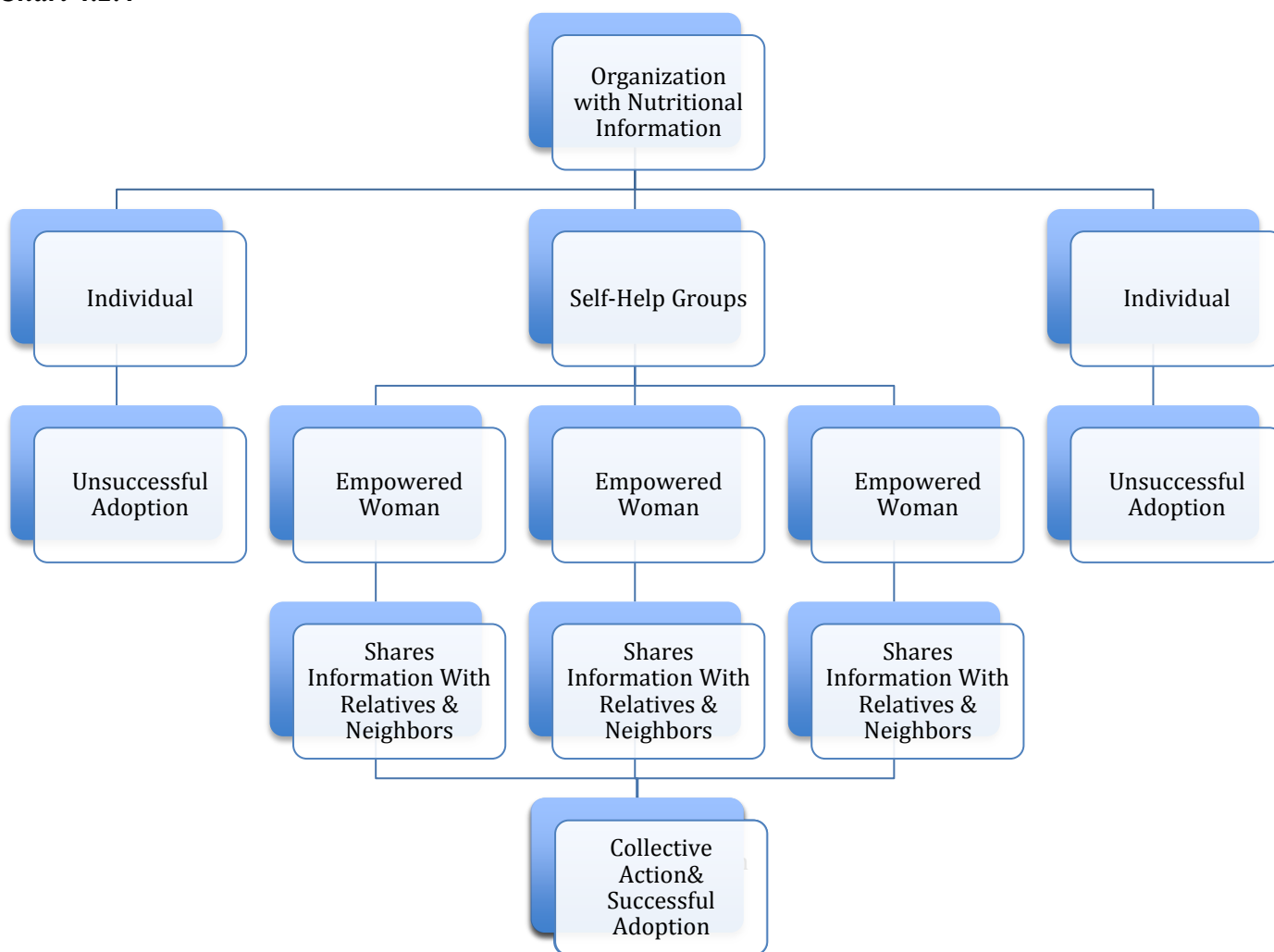
The purpose of this work is simply to introduce the concept of a connection between SHG involvement and nutritional status and indicate which areas should be focused on in the future. More research should be conducted on this connection, but with a greater depth. A comparison between villages with differing SHG participation rates is necessary to gather concrete conclusions about the affect of SHGs on household nutritional status. Moreover, an increase in sample size is also needed in order to include anthropometric data in the key findings of the study. This may mean going outside the VLS sample size is necessary.

From this short study, though, it is recommended that home production be promoted. With the decrease in production of nutrient-rich foods, there is also a decrease in the consumption of such foods. If these foods are home produced, then the family is more likely to consume them. If, instead, cash crops are grown, then there will be a decline in nutritional status for two reasons: 1) The family will have to purchase their food, which means that there could be a change in the variety consumed and 2) With the rising popularity of processed

foods, families are less likely to purchase traditional foods that are known to have high nutritional value. Along similar lines, there should be schemes implemented to encourage the consumption of cereal grains besides rice, such as sorghum, pearl millet, and finger millet. Even though it is still slightly more expensive than sorghum, because rice is at a subsidy, it decreases the total cost of rice per kilogram, allowing families to maintain rice as the staple in their diets. If there was some incentive to eat other cereals, however, then there might be an increase in their consumption, resulting in improved nutritional status.

Finally, it is strongly recommended to organizations that have information regarding nutrition to target SHGs as a venue for information dissemination. Below, Chart 4.2.1 illustrates the paths nutritional information can take. If shared with individuals, it can be expected that failure of adoption will occur. However, if given to SHGs, it is very probable the information will not only be successfully adopted by the SHGs, but also by Non-SHG members.

**Chart 4.2.4**



Simply because SHGs are such a strong network of women who have common interests, they are more likely to successfully adopt the information as a group than as individuals. But, what makes SHGs ideal as information distributors is how empowered SHG members are. The tools provided to SHG members make them equipped to share the information with other women, particularly neighbors. And, because neighbors are a primary source of information, information will be spread beyond the SHGs.



## 5. Personal Remarks and Closing Statements



*Being unwanted, unloved, uncared for, forgotten by everybody, I think that is a much greater hunger, a much greater poverty than the person who has nothing to eat.*

*~ Mother Teresa*

Looking back to the eight weeks I lived in India my mind instantly paints a mural of memories - of people, places, faces, sounds, tastes, aromas, colors - and I am reminded of a place I quickly considered a second home. How easily I'm taken back . . . to Indian urban bustle, bumper-to-bumper autos, busy people, bright lights, bangles, beautiful architecture – modern & historic – so different from my rural Illinois hometown. And to ICRISAT filled with bright minds and intelligent dialogue, decades of groundbreaking research and passion for empowerment and positive change for impoverished people. And, of course, to Aurepalle, which produces such vivid emotion within me I feel I'm actually there and yet longing to be at the same time. I close my eyes and see welcoming, work-worn faces of villagers young and old, friendly smiles, hopeful looks and curious glances, primitive houses, dry red soil – too dry with the drought – and worried farmers, school children playing, infant children lain in tall grasses while their mothers labor in the fields. I cannot imagine forgetting such rich memories embedded in my mind, my heart, and my soul.

These people are not unwanted; I want them. These people are not unloved; I love them. These people are not uncared for; I care for them. This is the only way I know how to keep these precious people from the greatest kind of poverty - by sharing their stories, keeping them in my heart and continuing my research. Through the impactful research ICRISAT's scientists diligently and passionately produce, these people are not forgotten. I will remember them; and ICRISAT research will feed them. They will not suffer the greatest kind of hunger. This is my fervent hope.

So many people I met this summer have been added to my extended family. It's crazy to think I had lived almost 18 years without knowing certain people, yet in just a few brief months they became an integral part of a life-changing summer and are forever interwoven into my fondest memories of India. From my mentors at ICRISAT, my fellow interns and the Aurepalle villagers I feel richly blessed to have expanded my family with such interesting, intelligent and hard-working people.

Of all my experiences as a Borlaug-Ruan intern, my field research trip to Aurepalle is the most memorable. It was a truly humbling experience to be generously welcomed into the village and participate in daily life with my host family and villagers. Conducting interviews with courageous, hardworking and inspiring village women gave me a clearer perspective on the hardships of village life and issues faced on a daily basis by rural

farmers. It was by observation that I made these conclusions because the women never complained; they just lived and gave of themselves generously to sustain their families every day. From jostling for a position to draw water from the ICRISAT well every morning, to working arduously in the fields all day to returning home to cook dinner at night, these women embodied courage, loyalty, unselfishness and strength. Just speaking to them during the interviews profoundly affected me. Natural conversations arose from the requisite questions I asked, revealing some insight into the personal lives of the women I met. It was my favorite part of the trip, hearing about their daily lives and hanging on every word hoping to hear more about the struggles they face and the precious moments they enjoy. My research was on gender development and empowerment of women – and these women empowered me.

One woman, for example, described how her 75-year-old husband has to continue working as a carpenter even though he is disabled and can barely walk. Over the course of the year, all of her husband's income will go toward necessary household and medical expenses. She cares for the house and for him in her old age too. They never make a net income. Yet the same woman shared with me how much they enjoy celebrating festivals, and how they will buy mutton and extra milk when their children return home for a visit from the city. The same woman offered me her necklace to enhance the saree I wore to one of the focus group discussions. I'm quite certain the necklace was the most valuable item she owned. How could she be so generous when she lived in such poverty? Suddenly, the 1,500 rupees for my room and board and the 50 US dollars of emergency cash I was instructed to take suddenly weighed down my backpack like bricks, as heavily as guilt weighed upon my shoulders. Parameters had been instructed, so I did not accept the necklace and did not give her money (that she likely knew I had and never asked for). I went to the village to help people like this woman – and she gave me the greater gift.

I came back from my village field immersion with a fervent desire to complete my research to the best of my inexperienced ability. Beyond this study, though, I am certain that this summer's research project will not be my last. Without a doubt, I plan to continue the path of gender development and nutrition studies in college. To have an opportunity to return to ICRISAT in the future and continue the research I began this summer would be incredible, but wherever I go I will always remember this summer as my starting point.

In the end, I am proud of the work I accomplished as a Borlaug-Ruan intern at ICRISAT. I am pleased that one of my mentors, R. Padmaja, found value in the research topic I created and has asked permission to continue the study in the coming year. Her proposal to continue my research is one of the proudest moments of my life, and I sincerely hope our efforts make a difference in the lives of people in need. But the study itself is not what has changed my life so profoundly. The experiences and the people have. Along with village ID numbers, I have faces of new friends; in addition to statistics, I have personal stories. I know with absolute certainty that wherever my future takes me, this Indian summer will never be far from my mind or my heart.

## Appendix

### *Individual Interview Questionnaire*

**Head of the Family Name:** \_\_\_\_\_

**VLS Household ID:** \_\_\_\_\_

**Female's Name:** \_\_\_\_\_ ; **Age** \_\_\_\_\_

**SHG Name (if involved):** \_\_\_\_\_

**Total Household Income:** \_\_\_\_\_ **Rs/Year**

**Education Level:** \_\_\_\_\_

**Number of Family Members:** \_\_\_\_\_

Self-Help Group

- When did you join the SHG?
  - Why did you want to join an SHG?
  - Who encouraged you to join/who told you about the group?
  - How much money do you contribute to the group, and how often?
  - Why did you want to join this SHG in particular/what about this group did you like/need?
  - How often do you attend your SHG meetings?
    - o Always (A)      Usually (U)      Sometimes (S)      Rarely (R)      Never (N)
    - Why? \_\_\_\_\_
  - Does your husband/son object to your involvement?
    - o If yes, why? If no, what does he think?
  - Was there ever discontinuity in your involvement in the SHG? If yes, why?
  - How many loans have you received so far?
    - o What for?
    - o How much was the loan?
    - o Were you able to pay back the loan and how long did it take?
    - o How long does it take before you start making a profit off the loan?
  - What are the requirements to receive a loan?
  - Who in the family decides a loan is needed?
    - o Husband SHG Member      Both      Depends Other: \_\_\_\_\_
    - o If depends, explain:
  - What, if any, are the rules for how the money can be spent after a loan is received?
  - Who decides what the loan is spent on?
    - o Husband/Son      Wife/SHG Member      Joint Decision Between: \_\_\_\_\_
  - How large is the average loan size?
    - o Largest: \_\_\_\_\_
    - o Smallest: \_\_\_\_\_
  - Who owns the resources the loan(s) provide?
  - What resources are bought with the loan?
    - o Dairy Producers (cows, goats)      Vegetables      Fruits      Farm equipment/technology
    - o Household technology      Education
    - o Other:
    - o Specifics:
  - How is decision-making power over the resource divided?
    - o Owner      Together      Husband/Son Only      Wife Only
    - o Why?
- 
- How many persons in the household generate an income?
  - How much does your husband make?
  - How much did you make before the SHG?
  - How much do you make now?
  - What are the three most costly expenditures your family has to pay for?
    - o 1) \_\_\_\_\_
    - o 2) \_\_\_\_\_
    - o 3) \_\_\_\_\_

- Do you think involvement in SHGs does (or would) increase the income you provide for the family?
  - o Yes No
  - o Explain: \_\_\_\_\_

Information Sharing

- What are the three most important things you learned from the SHG meetings?
  - o 1) \_\_\_\_\_
  - o 2) \_\_\_\_\_
  - o 3) \_\_\_\_\_
- Is there anything you wish the SHG would discuss, but has not?
  - o Yes No
  - o What: \_\_\_\_\_
- How much information is shared in SHGs?
  - o Considerable Moderate Negligible Restrictive
- What are the government welfare programs designs to increase nutritional intake?
- How is it most beneficial to learn about new information?
- How open are you to learning about and adopting new information?
  - o Very Open Somewhat Open Depends Not Usually Open Not Open at All
  - o If "Depends", on what:
  - o If "Not Usually Open" or "Not Open at All", why:
- What is the best way to obtain protein in the diet?
  - o Where did you learn this:

Nutrition

- What is the main staple in the family diet?
- What are the 5 most commonly eaten foods in the diet (Rank 1 being Most Eaten, 5 being Least Eaten) and how much of each item is consumed by the family?
  - o 1) \_\_\_\_\_ 2) \_\_\_\_\_ 3) \_\_\_\_\_ 4) \_\_\_\_\_
  - o 5) \_\_\_\_\_
  - o Why these items specifically?
  - o How often are these items consumed?
    - 1) A U S R N 2) A U S R N 3) A U S R N 4) A U S R N
    - 5) A U S R N
- How much do these items cost?
  - o 1) \_\_\_\_\_ 2) \_\_\_\_\_ 3) \_\_\_\_\_ 4) \_\_\_\_\_
  - o 5) \_\_\_\_\_
- What if food diversity like in the diet?
  - o Great Variety Some Variety Little Variety No Variety
  - o Why?
  - o Has dietary variety increased since joining the SHG?

Item Present 10 Years Back 30 Years Back

- Which foods have you stopped consuming now and why?

Item Why

- Which foods are you now consuming that you didn't before and why?

Item Why

- How often do you buy food?
  - o Frequently Sometimes Rarely Never
- What food items do you buy?
- How much does the season affect what and how much you buy?
  - o Great effect Some effect No effect
  - o Further Explanation:
- How much do you spend weekly on food?
- How much of your food is grown on your own?
  - o Almost all More than half About Half Less than Half Almost none
- What food do you grow for yourself?

- Is food distributed evenly among household members?
  - o If no, in what order is food distributed?
- What are some of the healthiest foods to consume?
  - o Rice      Pigeonpea      Sorghum      Pearl Millet      Maize      Vegetables      Fruit
  - o              Groundnut      Milk/Dairy      Protein/Meat      Other:

---

  - What types of Vegetables/Fruits (if listed):
  - o Why:
- How often are leafy vegetables consumed as part of the household diet?
  - o A              U              S              R              N
- What are the health benefits of leafy vegetables in the diet?
  - o Increases Iron      Increases Calcium      Increases Potassium      Increases Vitamin C
  - (can also list benefits attributed to these)
  - o Other:
- How often do you consume dairy products?
  - o A      U      S      R      N
- What type of dairy products do you consume?
- How expensive is it to buy dairy products?
  - o Very Expensive      Marginally Expensive      Not Very Expensive      Cheap
- How frequently is meat consumed?
  - o Daily      2-3 Times a Week      Once a week      Once every other Week      Monthly Almost never
- What types of meat do you consume?
- How expensive is meat?
  - o Very Expensive      Marginally Expensive      Not Very Expensive      Cheap
- How difficult is it to obtain these products?
  - o Very Difficult      Marginally Difficult      Not Very Difficult      Impossible
- What does availability of these foods depend on?
  - o Seasonality      Price      Ability to get to Market      Amount Available Nearby      Other:

---
- How far away is the closest produce market?
  - o < 15 km      15-30 km      30 -45 km      45-60 km      < 60 km      Don't know
- How do you get to one of these markets?
  - o By foot      By bus      By rickshaw      Don't know      Other:

---
- What are the three biggest issues the family/you is/are currently facing:
- Does involvement in an SHG help with these issues? Yes/No
- How healthy would you consider your child is?
  - o Extremely Healthy      Very Healthy      Healthy      Very Unhealthy      Extremely Unhealthy
- How healthy were your children before you joined the SHG (or, if non-SHG, 5 years before)
  - o Extremely Healthy      Very Healthy      Healthy      Very Unhealthy      Extremely Unhealthy
- Did you at some point or are you currently breastfeeding your child(ren)?
  - o Yes, but stopped      Yes, am currently Never for any children      For only some children
  - o Further explanation:
- Has anybody told you it is important to breastfeed?
  - o Yes      No      Who: \_\_\_\_\_

---
- Has anybody told you *why* it is important to breastfeed?
  - o Yes      No      Who: \_\_\_\_\_

---
- How old was the child when you began to introduce solid foods? What type of foods did you use?
- How old was the child when you stopped breastfeeding?

### ***Focus Group Discussion Guide***

**Number of FGD Participants:** \_\_\_\_\_

- What is the process of receiving/giving a loan?
- What is the most common type of loan?
- What is the interest rate?

- How long does it typically take to pay back a loan?
- What are the requirements to receive a loan?
- \*How many members default on their loan?
- \*What happens to these members?
- How does involvement in an SHG increase female income?
- How does the village in general perceive this SHG?
  - o Very Beneficial Beneficial Neutral Harmful Very Harmful
  - o Comments:
- \*Do SHGs loan to outside member?
  - o Yes No
  - o Comments:
- \*What, if any, influences outside the SHG members have a say in SHG activities and decisions?
- Are husband's opinions generally taken into consideration when discussing matters within the SHG?
  - o Yes No
  - o Further Explanation:
- What are the issues that the SHG discusses at its meetings?
- How are these issues solved/discussed by the group?
- Does the SHG provide new information to the group?
  - o Yes No
  - o What:
- How does the SHG receive this information?
- What type of information is given?
- Who delivers the information?
- What are some of the resources available to SHG members?
- \*Is nutrition a major concern of the SHG?
  - o Yes No
  - o Why:
- In what ways, if any, has the SHG impacted household nutrition?

**\* Indicates a Self-Help Group only question. During the Non-SHG FGD, these questions were omitted.**

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