A Case Study on the Nutritional and Health Outcomes of the Governmental Sanitation Campaigns in Dokur Village, India

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ICRISAT
Science with a human face

International Crops Research Institute for the Semi-Arid Tropics
Patancheru, Telangana, India

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1. Glossary

Anganwadis: institutions funded by the Integrated Child Development Scheme of the Government of India; nutrition centers for pre-school children and pregnant and lactating mothers that enhance nutritional awareness and provide fortified foods

Below Poverty Line (BPL): a benchmark used by the Government of India to determine whether households need financial or resource assistance

Caste: hereditary class system in Hindu society assigning people to specific occupations and duties; the forward, backward and scheduled castes are the prominent caste groups in Dokur, with forward being the most privileged, backward receiving less notoriety and scheduled being the most shunned

Central Rural Sanitation Program (CRSP): India's first rural sanitation campaign, which subsidized toilets to increase bathroom use from 1986-99

Gram Panchayat (GP): the village-level government in India, which tends to community needs with funds from the national government; Dokur's GP consists of eleven members, including seats reserved for the backward and scheduled castes

Institute for Rural Health Studies (IRHS): an organization of rural health clinics providing services to lower income households throughout the Telangana state

Information, Education, and Communication (IEC): a knowledge and awareness initiative gaining interest in campaigns and special events

Nirmal: "clean" in Hindi

Nirmal Bharat Abhiyan (NBA): "Clean India Mission" in Hindi; the Government of India's sanitation campaign from 2012-14, whose goal was to eradicate open defecation through toilet subsidization and community involvement

Nirmal Gram Puraskar (NGP): "Clean Village Prize" in Hindi; a program by the Government of India giving cash prizes to Gram Panchayats that achieve village cleanliness. If villages are completely open-defecation-free and establish high levels of solid and liquid management, the president honors them with this award

Open defecation (OD): the practice of relieving oneself outside without the use of a lavatory

Open defecation free (ODF): complete toilet usage at a community, state or national level

Sarpanch: the top village leader, who is elected to serve a single five-year term

Self-Help Group (SHG): a village group of ten to fifteen women who unite for financial assistance and empowerment

Stunting: a condition found in short, underweight children; youth who are two standard deviations below the median height for the age of the reference population

Swacch Bharat Abhiyan (SBA): "Clean India Mission" in Hindi; the 2014-19 sanitation campaign by the Government of India that aims to construct toilets and influence sanitation behaviors for an open defecation free nation

Total Sanitation Campaign (TSC): a 1999-2012 sanitation program by the Government of India that subsidized toilets using a "demand-driven participatory approach"

Village Dynamics Studies in South Asia (VDSA): three decades of longitudinal data from ICRISAT that explores the dynamics behind social and economic changes in the semi-arid tropical villages; also known as the Village Level Studies (VLS)

Wasting: a condition with links to long term cognitive deficits, illnesses and premature deaths in abnormally lightweight and short children; youth who are more than two standard deviations from the median weight for the height of the reference population

WASH (Water, Sanitation and Hygiene): programs typically led by development organizations that promote community cleanliness and sanitary behavior

2. Acknowledgements

First and foremost, the glory of this work goes to *God*, who not only infused breath in my lungs, but also bestowed in me a passion to make a difference, to never stop learning and to travel fearlessly to the ends of the earth. Your love, grace and mercy leave me in awe.

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When I pause and reflect on where my life has taken me and where I still intend to go, I am so humbled and grateful for my family's guidance and direction. To my parents, *Jeff and Rhonda Barchett,* raising me under your wings and showering me with your genuine love has hoisted me to this point. To my brother, *Charlie Barchett,* thank you for not only defining perseverance and hard work, but also for believing in me enough to edit essay after essay. *Grandpa Grau*, words cannot duly express how much I love you and miss your presence, but I will always remember your beam of pride when reading my intern acceptance letter. *Bob and Peggy Angeli*, *Mike and Carol Harrison* and my many, many other faithful relatives, thank you for your support throughout these eighteen wonderful years.

Besides the contributions of my family, my friends from the *World Food Prize Michigan Youth Institute* provided me the keys to success for this internship. *Makena Schultz* and *Brian Wibby*, thank you for giving me the opportunity to explore agriculture and youth

empowerment through the World Food Prize. To my fellow Michigan Youth Institute delegates, *Kayla Zhu, Autumn Zwiernik, Emily Kurburski, Reagan Gembarski and Loren King*, I find it an honor to be listed beside your names because honestly: you guys rock!

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To those who were not mentioned yet bothered to read this long list of names, thank you for being a friend by boring yourself with my words.

3. Personal Introduction

"If there is something you really want to do, you will find the time and ability to do it."
-Me

When I share with people my personal narrative up to this point, I begin by insisting that I have always wanted to make a difference. I cannot remember when I originally conceived this thought or whether the idea was inside me before I could breathe, but what does it matter? My greatest difficulty in living out my dream was never the question of *if*; it was always *how*?

From preschool to twelfth grade, I fancied myself in one career after another: a missionary, an actress, a veterinarian, a politician and everything in between. I involved myself in numerous service opportunities in hopes of finding my "one thing," and although I discovered many enjoyable activities, I knew I would one day have to make a critical decision. What on earth would I do with my career, in essence, my life? If I intended to make a difference, how would I do it?

During the summer of my senior year, I chanced across a poster for the World Food Prize Michigan Youth Institute and became very interested in the event. The advertisement described an opportunity to create solutions to food insecurity and present them to experts in various fields. Somewhere it also spoke of making a difference and empowering youth. Having almost no clue what food security meant, I chose to participate. Since that decisive moment, my life has drastically, drastically changed.

When I represented Michigan at the Global Youth Institute in Iowa in 2015, it was the first time I met people my age united around a common cause actively seeking to make a difference. War, famine, political conflict, climate change and every other significant problem had a direct link to food security and agriculture. Why was I just learning this? It was as if my eyes were suddenly opened. I resolved to study agriculture in college, but even before I submitted a university application, there was one opportunity I could not refuse: the Borlaug-Ruan internship.

I applied to the internship for several reasons. First, I was passionate about traveling and exploring places and cultures unlike my own. Secondly, the internship would be living out my "make a difference" principle, since I knew that previous interns' projects directly impacted people and shaped the course of their futures. Not knowing what I was stepping into, I applied. Months later (it seemed like forever!), I received word that I was to intern at the Markets, Institutions and Policies unit at the International Crops Research Institute for the Semi-Arid Tropics in India. Say that again? What place was that? What work was I to do? I had no virtually no clue what laid ahead, but hungry to pursue the incredible opportunity in front of me, I took a leap of faith. Looking back, I am *so* glad I did.

4. ICRISAT and the Markets, Institutions and Policies Unit

Founded in Hyderabad, India in 1972, the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) was the first center officially established in international agricultural research (Walker and Ryan xvii). As one of the current fifteen members of the Consultative Group of International Agricultural Research (CGIAR), ICRISAT continues to embrace its mission of improving livelihoods in the semi-arid tropics and beyond ("Overview").

According to Dr. William Dar, former Director General of ICRISAT, ICRISAT's desire is "to put priority on innovations that would move farmers from poverty to prosperity, instead of innovations that would leave them only a little less poor." The organization accomplishes this objective by enacting its four keystone values:

1. "We" not "me"
2. Inclusive culture
3. Leadership by example: inspiring yourself and others
4. Strategic and systems thinking to change, grow and improve ("Overview")

ICRISAT applies each of its values as it grows chickpea, pigeonpea, sorghum, pearl millet, finger millet and groundnut, its six mandate crops. Referred to as "Smart Foods," they provide health, environmental and planetary benefits to semi-arid communities. In addition, ICRISAT divides its research into four essential units, which are Resilient Dryland Systems, Grain Legumes, Dryland Cereals, and Markets, Institutions and Policies ("Overview").

Because I never enjoyed lab work yet still appreciated the precision of scientific research, the World Food Prize appropriately stationed me at ICRISAT's Markets, Institutions and Policies unit. There I met with economists and data analysts whose careers focused on studying village dynamics in the semi-arid tropics. The fruits of their labor have been published in a comprehensive dataset called the Village Dynamics of South Asia (VDSA), which strives towards "enhancing the understanding of agricultural development in one of the poorest rural regions of Asia" from in-depth studies at a household and village level (Walker and Ryan 9-10). My mentor, Dr. R. Padmaja, was the chief scientist of the unit, whose expertise in gender empowerment, nutrition and health provided a strong foundation for my project.

Today ICRISAT is well known as an agricultural research and development organization that strengthens the resilience of agricultural and rural living conditions. Surely many challenges lay ahead for those in semi-arid regions, but with ICRISAT's insights and proven leadership, hope and prosperity are never far off.

5. Abstract

Health research traditionally focuses on the importance of nutrition while ignoring the effects of hygiene and sanitation. As efforts to provide adequate micronutrients and macronutrients to households have not universally eradicated malnutrition and its associated problems, it is increasingly important to seek sanitary interventions as solutions. While India has made commendable economic progress since becoming a nation in 1947, it infamously houses one of the world's worst sanitary environments. Its population density, poor refuse system and widespread open defecation practices have been linked to high levels of malnutrition and disease. Because Indian children are generally more stunted than their counterparts in poorer African countries, economists call them the "Asian enigma" of development. To address the nation's sanitary inadequacies, India began implementing aggressive national sanitation movements in 1989. The current Swacch Bharat Abhiyan (SBA) campaign began in 2014 with the largest budget of any sanitation program. Its intentions to subsidize toilets for Below Poverty Line (BPL) households and spread hygienic awareness through door-to-door surveys, social media advertisements, road cleaning events and school programs are commendable, but malnutrition and sanitation remain immense threats to India's vitality. In the rural agricultural village of Dokur, water shortage, toilet inaccessibility and widespread sanitary disregard hinder the health and wellbeing of families. Through household surveys, focus group discussions and key informant interviews, this study reveals that the government sanitation campaigns produced minimal impacts on household nutrition, sanitation and hygienic knowledge.

6. Literature Review

"*Sanitation is more important than independence."*
–Mahatma Gandhi, Father of India

Until recently, the struggle for universal sanitation stood suspended on the backburner, a topic to be discussed only after malnutrition and poverty were firmly placated. As researchers worldwide increasingly acknowledged the relationship between sanitation, nutrition and health, they deemed it detrimental to defer solutions further. While people may receive adequate nutrients and energy, sanitation-related illnesses often prevent them from being fully utilized. Inextricably linked to sanitation is the enduring problem of child stunting, which creates immeasurable barriers to youth's health and cognitive potentials. Added together, poor personal hygiene, unsafe drinking water, inadequate local and home sanitation, and improper disposal of wastewater, garbage, and human and animal dung deliver disastrous consequences to all parties involved. Without immediate action, millions more will reap the consequences of mendable sanitary problems ("The Sanitation Challenge").

Sanitary enhancement is a road with few twists and turns if the proper resources and human behavior are upheld. Unfortunately, many nations find such improvements immeasurably difficult due to their implanted cultural, social and gender norms. A

nation's deeply rooted beliefs and values systems sometimes forbid the practical application of soap, the disposal of waste, and utilization of lavatory facilities, while its social stigma can make adopting such practices illogical and even crude ("Water, Sanitation and Hygiene Annual Report").

From a gender perspective, women are easy targets of sanitary obscenities. Despite women being significant determinants of a family's nutritional wellbeing, males' preferences continue to dictate the bulk of households' decisions. Although improvements certainly have occurred within the last few decades, the amount of women leaving school during menstrual periods and sanitary-related illnesses (or to care for family members experiencing them) is disgruntling. More disheartening is that many women must relieve themselves outside, only going when it is dark for the sake of dignity ("Water, Sanitation and Hygiene Annual Report").

While some experience sanitary deficits more profoundly than others, sanitation is everyone's problem. Many countries have begun including sanitation as a legal and defendable right, with Kenya's constitution standing as a commendable example. Its new constitutional draft affirms, "Everyone has a right to a reasonable standard of sanitation." An authoritative World Bank study verifies the severity of ignored sanitation. In a report titled "Economic Impacts of Inadequate Sanitation," the World Bank stated that an "overall 50 percent (39-61 percent) of the health burden of malnutrition was […] attributable to poor water, sanitation, and hygiene." As countries follow Kenya's lead and the examples of many western countries, India stands out as a peculiar case in sanitation (Chambers and Von Medeaza).

India has made admirable leaps to success as an economy since becoming a nation in 1947, yet it infamously houses one of the world's worst sanitary environments. Increasing its population density and per capita while boasting more open defecators than the next eighteen countries combined, twenty-first century India is a paradox of rising affluence coupled with uncleanliness. It is not that the government ignores its own problems; to the contrary, it has paid billions for the cause of sanitation. From 1986's Central Rural Sanitation Program to the Swacch Bharat Abhiyan (SBA) of today, India has continually subsidized the construction of toilet facilities. After several all-encompassing efforts, 594 million Indians continue open defecation (OD). That is forty-seven percent of the population and over half of the globe's open defecators (Bathran).

The SBA allegedly intensified its sanitation awareness component, but one must wonder if the program truly churns out OD and initiates hygienic habits or fails like its predecessors. From the billions it spends, one can only hope that the SBA is bringing meaningful change to India's populace. Its goal to eradicate OD and improve the nation's waste disposal system by 2019 is ambitious and commendable. The question is whether it is realistic (Bathran).

Although the SBA reserved only eight percent of its budget to information, education and communication (IEC) programs, the Government of India insists that its door-to-door conversations, school curricula and public projects are capable of reversing unsanitary

practices. Its budget for these awareness programs is dangerously low, but at least the SBA recognizes that solely giving away toilets and hygienic materials does not alter embedded mindsets. Behind people's decisions to use sanitary facilities are the stringencies of caste, which prescribes waste cleanup to the lower caste groups. Moreover, a culture of male dominion, an immense population density, regional water shortages, Hindu writings hinting at OD and a widespread lack of sanitation awareness generate sanitary disaster (Bathran).

India's semi-arid tropics is in a particularly problematic sanitary situation. Known widely for its scanty and variable rainfall, infertile soils, droughts and stark poverty, it is the perfect environment for sanitation to be ignored. Villagers heavily depend upon dryland agriculture to sustain their livelihoods, continuing much of their traditional caste customs and occupations. Aiming to improve village health, numerous non-governmental organizations and governmental agencies have implemented nutritional education programs and handed out supplementary child foods, fortified ingredients and food subsidies. Their work is effective to some degree, but subsisting illnesses rooted in sanitation prove that more must be done. OD is rampant in many semi-arid villages, while hygienic practices remain largely unknown. Nutritional deficiencies are widespread, stunting and wasting remain relatively stagnant, and household and street conditions are far from hygienic (Rama et. al.).

From macroeconomic and microeconomic observations, it is abundantly clear that sanitation is a pressing issue linked to nutritional and health outcomes. Programs by the Indian government from 1986 onward reveal toilet construction as a means to sanitary enhancement, but its results have been far from effective. Derisorily, twenty percent of the toilets built by the government in 2001 were still in use by 2011. While the Government of India insists that it spread messages on hygiene and sanitation and built toilets to reach millions of people, the people's blatant disregard of sanitation reveals a widespread lack of knowledge. The question arises: Is the current SBA truly generating positive long-term change (Bathran)?

7. Methodology

My intern project explores the link between government sanitation programs and the nutritional status of households, with women and children as the groups of focus. The study inquires whether the SBA and its predecessor campaigns improved health and sanitation outcomes in the semi-arid tropical village of Dokur in Telangana, India. My data came from previous Village Level Studies and a weeklong visit to Dokur Village, where I conducted survey interviews, led focus group discussions and conversed with village leaders.

7.1 Dokur Village Profile

Semi-arid tropical regions are characterized by prolonged droughts and erratic rainfall, and Dokur Village of the Mahbubnagar district in Telangana has certainly experienced its

share of both. Due to weather unpredictability, a rapidly expanding population and the high-risk nature of villagers' agricultural occupations, Dokur has struggled to emerge as a viable South Indian economy. Recent diversification to non-agricultural occupations has led to improvements in income and nutritional status, yet the conditions endured by many villagers continue to be sub-standard (Rama et. al.).

The current status of Dokur reveals a mixture between its past agricultural dedication and present attempts to provide alternative income. Farmers are used to temperatures between 20 and 40° Celsius as well as annual rainfall hovering around 730 millimeters. To best utilize their red heterogeneous soil and dry climate, farmers plant paddy, castor, pigeonpea and groundnut during the *kharif,* or rainy season. During the *rabi*, or post-rainy season, farmers cultivate groundnut and paddy (Rama et. al.).

While the majority of the village depends on agriculture for its livelihood, a significant percent continues its caste occupations or has expanded to non-farm labor. Driving autorickshaws, milling rice and flour, selling milk, running petty businesses and working for non-governmental organizations are among the many occupations in which villagers are now participating. Since the village is only 130 kilometers from the urban center of Hyderabad, it is increasingly common for people to migrate for stable employment benefits (Rama et. al.).

Despite villagers' evolving livelihoods, their traditional customs and caste norms remain as they were decades ago. Hinduism continues to be the dominant religion of the village, practiced by all households with the exception of a few Muslims. In addition, the caste system influences land allotment and wealth within the village. Those from the scheduled and backward castes typically possess the lowest social status, acreage and income, while the small amount of forward caste members relish most advantages. The caste system carries a substantial burden because the vast majority of Dokur's people come from the scheduled and backward castes (Rama et. al.).

Just as the caste system is ever present in Dokur, the Gram Panchayat (GP) continues to be an active—yet positive—contributor to village dynamics. As the village's elected body, the GP has a sarpanch leader and eleven members, with seats reserved for the underprivileged castes. Besides erecting public water sources, roads and other local infrastructure, the GP has allocated resources for the building of a Primary, Secondary and Higher Secondary School and provided two Anganwadi centers for education, nutrition and medical services for parents and young children (Rama et. al.).

7.2 VDSA Longitudinal Data

As expounded upon in Walker and Ryan's *Village and Household Economies in India's Semi-Arid Tropics*, the Village Dynamics in South Asia (VDSA) or Village Level Studies (VLS) is a comprehensive dataset recording household dynamics in rural Indian villages. The VDSA in Dokur Village traces its origin many decades back, beginning in 1975 and continuing irregularly until 2014.

This study uses the 2005-14 VDSA data on caste, toilet ownership, income and gender literacy. The aforementioned factors enhanced understanding on the driving forces behind lavatory ownership and the overall health and education conditions of the village. In addition to the toilet-related data, BMI statistics from the VDSA's 2010 and 2012-14 data were beneficial for determining villagers' health statuses. The software program used for the VDSA data and the Dokur Village fieldwork was Microsoft Excel for Mac 2011 Version 14.6.5, with personal spot-checking to ensure accuracy.

7.3 Dokur Village Fieldwork

7.3a. Household Surveys

The majority of the data for this study came from a weeklong survey of households in Dokur Village. Because women play a vital role in allocating food to their household and ensuring their family's nutritional wellbeing, the study selected all female respondents. Their ages varied from as young as seventeen to as old as sixty-one years, with each of them being the primary female household decision maker. Most surveys occurred within the tranquility of respondent's homes, seeking to maximize privacy due to the highly sensitive and personal nature of some questions. Each survey lasted between fifteen to thirty minutes so as to ensure that respondents thoroughly answered the questions without growing either impatient or weary.

The survey questionnaire varied from forty-one to forty-four questions depending upon specific follow-up answers. Each respondent answered questions from five main sections:

1. Demographic (ten questions)
2. Basic Sanitation (seven questions)
3. Nutrition/Health (five questions)
4. Open Defecation (nine questions)
5. Toilet Owner or Non-Toilet Owner (thirteen questions for toilet owner and ten questions for non-toilet owner)

7.3b Focus Group Discussions

For qualitative data collection, I organized three focus group discussions to ask open-ended questions and follow-up prompts. These conversations granted me the information behind sanitation attitudes and practices in the village. Interviews lasted about a half hour, with a snack afterwards to reward participants. I hosted discussions with twelve girls (ages twelve to eighteen), eight men and eight women.

7.3c Key Informant Interviews

Some of my greatest qualitative information came from the four key informant interviews, which lasted between ten and forty minutes. At the village's school, I spoke with the headmaster and his subordinates about the school's sanitation practices and involvement with the SBA. I also interviewed a rural health clinic nurse and an Anganwadi worker to discern the village's sanitation and nutrition challenges and

practices. Lastly, my conversation with the village sarpanch revealed the GP's efforts towards improving village sanitation and expanding the SBA.

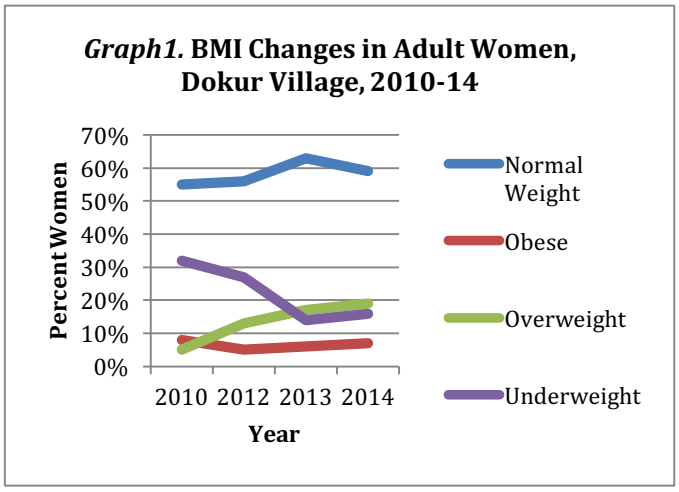
7.4 Limitations of Study

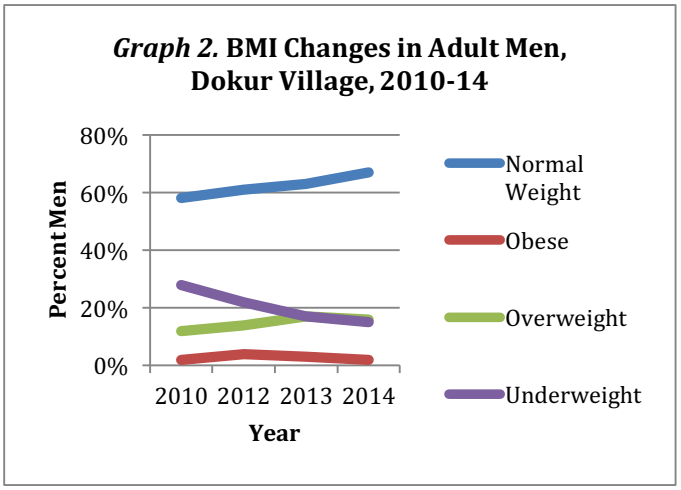
A more inclusive report would have been possible only with greater time. If more than two months of research were available, this one village study could have expanded to include other VDSA villages, especially the parallel village of Aurepalle. Furthermore, this report shows the dampening effect of Dokur's water problem on the sanitation campaign, which may define the village's sanitation problems more than open defecation and sanitary ignorance. As a result, Dokur may be an unrepresentative village of rural India's sanitation struggles and typical responses to the SBA. A final obstacle to this study was the few number of households benefitting from the government sanitation campaign subsidies. As a result, the effect of sanitation campaigns on beneficiary households could not be fully analyzed, defeating much of the purpose of this study.

8. Analysis

8.1 Nutrition and Health of Villagers

Dokur has seen sizable improvements in nutrition and health over the last decade, with spillover effects on toilet ownership and sanitation. Positively, the BMIs of villagers have increased to the point where over fifty percent of adults now have a normal, healthy bodyweight. Due to income increases, occupational diversification to areas beyond agriculture and crop nutritional improvements, underweight prevalence is steadily decreasing. At the same time, obesity in the village heightened in women from 2010-14, which indicates that despite accessing greater food quantities, villagers are not necessarily better nourished.





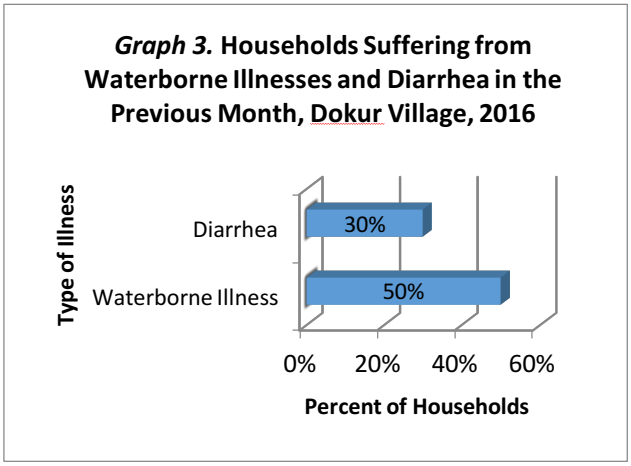
Children also serve as important indicators of village health, but due to the difficulty of measuring BMIs during stages of child development, these statistics were not calculated. Child malnutrition still persists strongly throughout the village, shown by the thirty youth per year attending the clinic with signs of it. While thirty

seems like a small number, it is approximately half of the child patients the rural clinic treats annually. One can only guess that most of these malnourished individuals would classify in the underweight BMI categorization.

It is no wonder that numerous villagers in Dokur are malnourished: their typical diet contains plenty of calories and carbohydrates while lacking equally important micronutrients. Most respondents rely on white rice as their staple food item, with its condiment, pigeonpea dal, being the second most consumed food.

8.2 Sanitation Prevalence in the Village

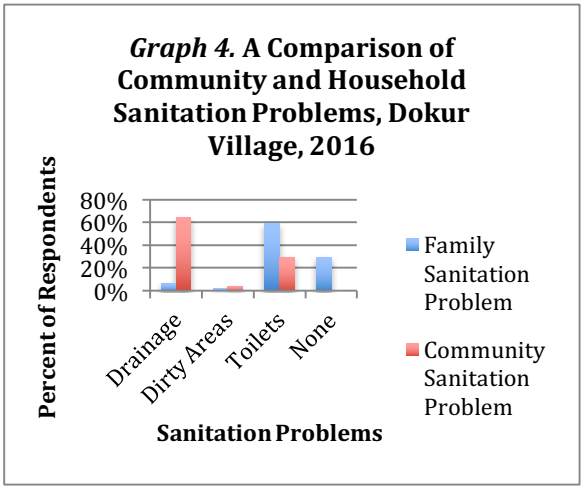
Improving nutrition is not the only key to enhancing the wellbeing of villagers; as this study emphasizes, the consequences of poor sanitation exert a tremendous toll on individual and community health. One can observe the severity of Dokur's situation by the fifty percent of respondent households who suffered from waterborne illnesses in the past month. Diarrhea, an especially strong indicator of sanitary insufficiency, occurred in three-fifths of the households facing waterborne illnesses.



When seeking to reduce the incidence of waterborne illnesses and other associated sanitation problems, one must first understand the preventive measures that households are already taking. The female survey respondents, who were in charge of house cleaning, often mentioned their sanitation tendencies as cleaning the house and toilet (if they had one) a few times each week. These individuals typically did not cite a reason behind their actions because they cleaned merely out of habit and upkeep necessity. Hand washing habits within the home also varied, with males, females and children disclosing different hand washing times. Men and women focus groups both admitted to hand washing before eating and after fieldwork, while the adolescent girls' discussion group expanded to include the practice after defecation and games.

In comparison to adults, children definitely possessed the greatest sanitation habits. Each of the school's teachers promoted health practices during class, with the biology teacher devoting extra time to discussing the matter. Because of the school's rigid health standards, students nearly always washed their hands with soap, cut their nails, combed their hair and disposed of trash in dust bins. They also had a WASH committee to clean the toilets and classrooms. From conversations with the adolescent girls' discussion group to my interview with the school headmaster, I determined that children not only sought to practice sanitary measures, but also knew the health benefits of doing so.

8.3 Sanitation Challenges at a Household and Village Level



Familial and village sanitation challenges varied greatly, yet both revolved around drainage and toilets. On a household level, sixty percent of respondents mentioned that toilets were their family's foremost barrier to sanitation. Respondents meant that access to a toilet was either unavailable or that the toilet they owned was unusable. Those with unusable toilets included respondents with only a base level lavatory in place. Thirty percent of households stated they had no sanitation problem at all. While most uttering this answer were economically well off, they were also among the ones that practiced open defecation and cited cleaning the house as their only sanitation practice. In contrast to household sanitation challenges, community sanitary insufficiencies revolved around the drainage system. Sixty-five percent of households complained about its poor upkeep, which attracted flies and mosquitoes.

8.4 Water and Its Effect on Village Sanitation

Although no villagers mentioned water as a sanitation problem, they commonly agreed that it undermined the bulk of their sanitation struggles. Due to a drought three and four years back, villagers accessed water once every four days in a one-and-a-half-hour interval. For small families, the burden was bearable, but for those with larger households or livestock, it constituted an extreme challenge. As a consequence, many villagers labeled toilet use as impractical and especially wasteful for children.

The village drainage was also a community-wide water dilemma. The system's continued uncleanliness made it a common site for refuse, child OD practices and roaming wild boars. Worst of all were the mosquito and fly populations in the drainage areas, which may have led to health problems for passerby. While the sarpanch promised villagers that he would clean the drainage bimonthly, his lofty intention amounted merely to an annual cleaning.

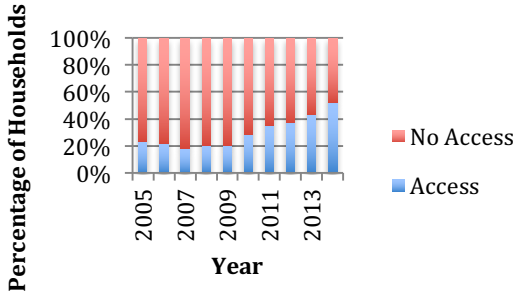
8.5 The Effect of Literacy, Caste and Income on Toilet Access

While this study's intention was to compare households with and without subsidized toilets from the SBA, it was almost equally important to compare households with toilets and those without. Since lavatory utilization can prevent a number of waterborne illnesses and health problems, one can assume that those with toilets possessed greater degrees of health than those lacking. An in-depth analysis of dynamics behind toilet ownership also showed the intertwining roles of literacy, caste and income when considering toilet construction.

When the 2005 VDSA in Dokur began, Dokur's disparities between toilet access and lack of access were sizeable: twenty-three percent of respondents owned toilets, whereas seventy-seven percent did not. Ten years later, the VDSA's statistics reflect a significant transformation in the ownership percentage, demonstrated by forty-eight percent of villagers who had access and fifty-two percent who lacked access in 2014.

One of the variables greatly affecting intrahousehold toilet ownership in Dokur was the literacy of the male and female household heads. In six out of the ten survey years, the literacy of females served as a greater gage of toilet ownership than males. Furthermore, in the years when female literates had a lesser effect on toilet access than men, their disparity never reached ten percent.

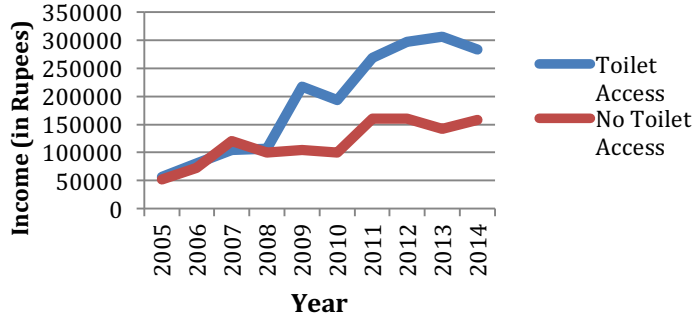
***Graph 5.* Households with Toilet Access, Dokur Village, 2005-14**



Because females were greater determinants of toilet access in Dokur than males, additional scrutiny of their literacy was deemed necessary. In particular, the question was posed on how literate and illiterate females differed in toilet ownership. Investigation of the VDSA data proved that despite females' low probability of literacy, those with a basic education had a greater likelihood of owning toilets in each of the ten survey years. The gap between illiterate and literate toilet ownership became especially disproportionate from 2009 onward, indicating that education had a greater effect on female toilet ownership more recently than in the past.

Literacy proved a valuable indicator of toilet ownership in Dokur village, but gender and education alone failed to explain all matters determining lavatory possession. India's deep-rooted caste system also played a measurable role in villagers' toilet access. In each of the ten VDSA years, the forward caste (FC) had a higher probability of owning lavatories than either the backward (BC) or scheduled castes (SC); however, the FC's small population had a trifling effect on Dokur's overall ownership percentages (only six percent of the survey respondents were FC). The BC clearly came in second place out of the three castes in toilet ownership percentages, while the SC had no respondents even owning lavatories until 2013.

***Graph 6.* Income Effect on Toilet Access, Dokur Village, 2005-14**

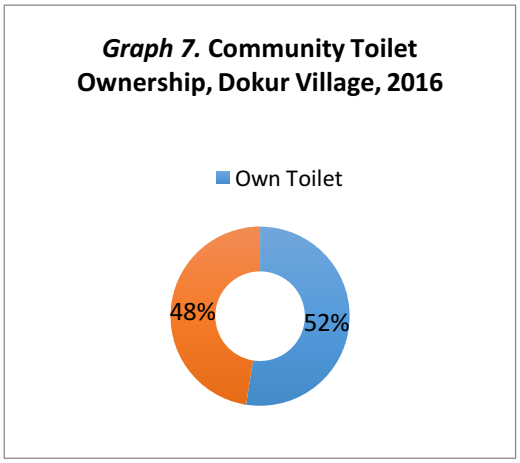


Complementing the gender, education, and caste dimensions of lavatory ownership in Dokur was monetary wealth, a predictably strong motivation for obtaining sanitary facilities. Calculations of the average income of those owning

toilets and those without toilets supported the assumption that wealth played a role in toilet possession: the income difference between the average toilet owner and non-owner hovered around seventy-five thousand rupees; nevertheless, it was found that two of the three richest households did not possess toilets.

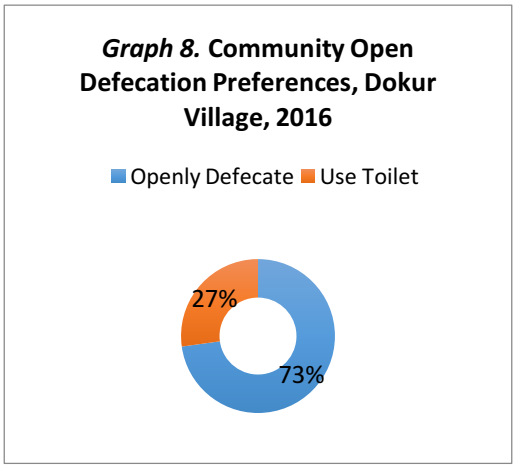
8.6 A Sanitary Enigma: Open Defecation in Spite of Toilets

Throughout India, it is not unusual to learn of toilet owners abandoning lavatory use shortly after their unit is constructed. Dokur mirrored this ongoing national problem because approximately half of villagers owned toilets yet three-fourths openly defecated.



Graph 7. **Community Toilet Ownership, Dokur Village, 2016**

I found that males, females and children all possessed different reasons for OD. Survey respondents believed that seventy-eight percent of males defecated in the open and sixty-eight percent of respondents thought the practice was a habit. Male focus group participants even admitted to OD for relaxation, comfort and feelings of freedom.



Graph 8. **Community Open Defecation Preferences, Dokur Village, 2016**

Reasoning behind female OD differed greatly from males, as evinced by the much smaller percentage involved in the practice. Unlike the males who were habituated to OD, women commonly stated their preference for toilets. The vast majority of female respondents despised OD due to its lack of safety and cleanliness, not to mention the intimidation of males around the vicinity.

Children were among the most unfortunate victims of the toilet and OD enigma since they knew the most about sanitation but were prohibited by their parents from practicing it. Eighty-one percent of children were thought to defecate in the open, which was even higher than the amount of men. When asked why so many children turned to OD, survey respondents reasoned that children wasted toilet water and feared sophisticated defecation.

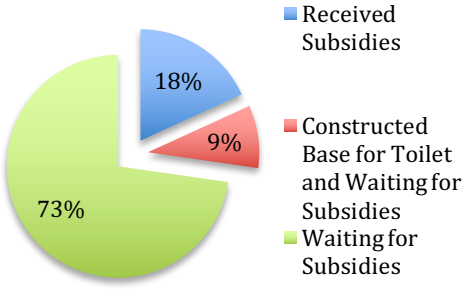
Combining the OD reasons of males, females and children, survey respondents discussed village-wide attitudes behind toilet disuse. Although many respondents could not pinpoint macro-level reasons for village OD, those who did reasoned that a lack of toilets and water shortage were the key factors.

8.7 The Intentions of the Government Sanitation Campaigns

In hopes of improving Dokur's sanitation conditions, particularly its toilet use, the Government of India began promoting its sanitation campaigns in the village as early as 2006. The Total Sanitation Campaign (TSC) offered toilet subsidies in Dokur until 2012, when the Nirmal Bharat Abhiyan (NBA) took over. In 2014, the NBA faced slight alterations to become today's Swacch Bharat Abhiyan (SBA). Despite the heavy promotion of each of the sanitation programs, the campaigns have not been far-reaching. The TSC assisted one respondent household and the NBA helped three, which together constituted only ten percent of all respondent residences. Ironically, the SBA spent more money and resources on sanitation promotion than the other campaigns, with its village-wide announcements and door-to-door surveys, yet no households benefitted.

One of the foremost goals of the SBA and its prior sanitation campaigns was to increase public awareness of sanitation and its links to positive health. While thirty-nine out of forty of those surveyed knew about the SBA in their village, the information they identified pertained only to the door-to-door survey. During the door-to-door survey, the GP visited households and asked whether they owned toilets. If households did not own a toilet and fit into the Below Poverty Line category, the surveyors would encourage the people to build a toilet foundation. Once the foundation would be completed, the government would finish the toilet construction and reimburse the household 12,000 rupees. Beyond learning about the SBA's toilet subsidy offers, none of the villagers save two GP politicians gained sanitation knowledge from the campaign.

Graph 9. **Toilet Subsidization Situation in Dokur Village, 2016**



Clearly the SBA's door-to-door survey in Dokur did not enhance sanitation awareness, yet the campaign's school efforts achieved laudable results. Through the SBA's Swacch Pathchala ("Clean India: Clean Schools") project, students learned to compost, dispose refuse in dustbins and use toilets properly. Combined with the school's existing health lessons, the SBA ensured that children understood the reasons behind sanitation.

The problems with the government sanitation campaigns, particularly the SBA, were obviously rooted in a lack of sanitation awareness, yet that was not the only major issue. In Dokur, four survey households benefitted from the twenty-two that applied. Two of the eighteen waiting households had already completed their toilet's base construction and most of the remaining homes were trying to resolve SBA matters with the GP.

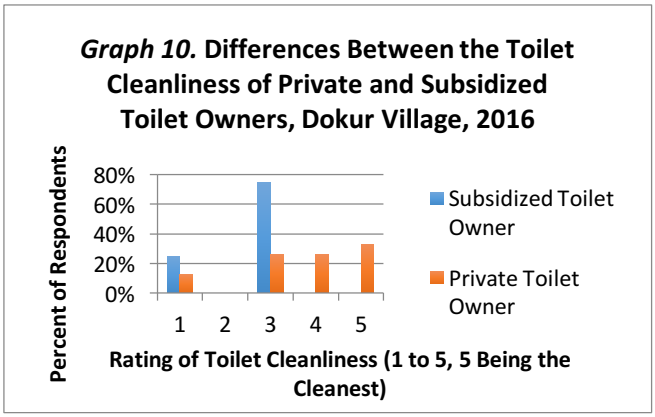
Those the GP sought to reach were poorer households whose top reason against owning a toilet was the construction cost. This was a stark contrast to the many current toilet

owners claiming that convenience was their top ownership reason. From this observation, one could assume that the households with the monetary capacity to purchase toilets already obtained them, while those lacking them were hindered financially.

8.8 Comparing the Characteristics of Subsidized and Private Toilet Owners

Because only four of the forty respondent households were toilet beneficiaries, it was difficult to evaluate the effect of the government's sanitation campaigns on the nutrition and health of beneficiaries specifically. I scoured through the data anyway in hopes of finding inherent characteristics of this specialized group. Without completely extrapolating the data, I noted that the average toilet construction difficulty rating of beneficiaries was 4.25 out of 5, with 5 being the most difficult rating. In other words, beneficiaries faced huge challenges constructing a toilet despite assurances of subsidies. Two toilets were partially funded by the government and two were completely paid for, yet all four of them admitted to asking the GP for aid repeatedly.

Besides the barriers involved in toilet construction, the toilet cleanliness levels of beneficiaries revealed useful information. Compared to private toilet owners, those with subsidized toilets were less likely to maintain washroom cleanliness. None of the four beneficiaries rated their toilet cleanliness above a three, while out of the sixteen private owners using their toilets, sixty percent gave themselves four or five ratings. This indicates that those with private lavatories were more inclined to practice sanitary habits, while those with subsidized facilities were either less aware of sanitation or did not possess the financial ability to put their knowledge into action.



Income may have been the reason for the contrasts between subsidized and private toilet owners. Nearly all households with government toilet subsidies were poorer than those without them, because the average private toilet owner's income was 1.82 times more than the typical subsidized owner. Likely due to lesser income, none of the subsidized toilet owners opted for convenience as its reason for toilet adoption. Two subsidized respondents chose privacy and dignity as motivating factors, one claimed that a toilet improved its social status and the remaining one mentioned the toilet subsidy as its only reason.

8.9 Toilet Ownership and Its Relevance to Nutrition and Health

Due to the trivial number of surveyed households benefitting from the sanitation campaigns, I could not thoroughly compare the nutritional and health outcomes of subsidized toilet owners with private toilet owners. Still desiring to explore the links of

toilet ownership to health, I compared nutritional and health indicators of those with toilets to those without. Those possessing toilets were more confident in their children's nutrition than non-owners. Although the statistics behind this finding are subjective and therefore based on the respondent's definition of adequate nutrition, the links between toilet ownership and health undeniably exist. One could also argue that income plays a role here, in that those who were wealthy typically owned toilets and possessed the financial capacity to purchase food. The female BMI statistics of toilet owners compared to non-owners supported this theory, showing that toilet owners were on average heavier than non-owners.

8.10 Toilet Ownership Reasons and Their Correlation to Nutrition and Health

Along with comparing toilet owners to non-owners, a look at the reasons for toilet adoption provided insightful information regarding sanitation attitudes and practices. Health and sanitation was the most common reason individuals funded toilets independently, yet their definition of health and sanitation usually amounted to using a toilet when sick. Few of the respondents claimed that toilets were preventive and beneficial for their health, which was the focal point of the SBA's mission.

Viewing the toilet ownership reasons alongside the data on subjective child nourishment, female BMI and toilet cleanliness revealed that those having toilets for convenience believed their children were nourished, were least likely to be underweight and were most likely to award their toilet a high cleanliness rating. At the same time, this group of people was the most likely to be overweight or obese. Meanwhile, those owning toilets for sanitation and health did not have significantly positive indicators.

9. Conclusion and Way Forward

"*Sanitation is primarily a behavioral issue, to be undertaken by people themselves for their own good. The role of the government is only to facilitate this positive change by providing incentives and assisting people."*
- Saraswati Prasad, Joint Secretary for India's Ministry of Drinking Water and Sanitation

Throughout the last decade, Dokur Village has leapt to notable heights in sanitation and health. Villager toilet access has increased from nearly zero to over fifty percent, all while their BMIs have steadily moved away from the underweight category. Despite the enhanced wellbeing of villagers, water shortage coupled with a lack of sanitation and hygiene awareness present Dokur with innumerable struggles.

Open defecation persists throughout the village, even though many have the option to use toilets. Reasons for this enigma vary from male habituation to forced child toilet ignorance to water constraints. During the Swacch Bharat Abhiyan and its precursor sanitation campaigns, Dokur's Gram Panchayat has continually aimed to promote lavatory use through toilet subsidies and awareness rearing, but efforts at altering

sanitation mindsets have gone largely unheeded. In spite of its aggressive door-to-door survey and toilet subsidization assurances, the current sanitation program brought minimal awareness and provided no toilets to Dokur.

While the SBA and its prior campaigns led to no significant sanitation or health results, children stand as a remarkable exception. The SBA promoted composting, dustbin use, hand washing and toilet utilization at the village school, which the children adopted alongside their health and sanitation lessons. However, many parents limited the effectiveness of youth sanitation habits by preventing toilet use and imposing their traditionally unhygienic tendencies.

The road to open defecation correction and subsequent sanitary improvement in Dokur is laden with obstacles, yet through a few key corrections, a bright future may not be far off. In regards to the water crisis, three specific solutions wield potential influence. The first suggestion is that the village install personal and communal rain harvesting structures. If villagers have greater water access, the implication is that they will increasingly prefer toilet usage. Accompanying water-harvesting techniques is developing toilets that are both friendly to the environment and conserving of water. The SBA should consider incentivizing these toilets for Dokur, or at least investing in research that allows them to become affordable and preferable for village use. Finally, those currently owning unusable toilets should be given the option to apply for subsidies for new or water-improved toilets instead of missing out on governmental benefits.

Mending the water-related difficulties in Dokur is not the only key to enhanced village sanitation. Besides cleaning the drainage in a proper and timely manner, the GP should focus its efforts on enhancing the awareness component of the SBA. Behavior change is one of the most challenging areas to address in any society, but if effectively performed, it leads to long-term improvements in attitudes and resultant actions. To foster the adoption of sanitation habits, the SBA in Dokur should expand upon its successes at schools. Through teaching children sanitation habits and explaining the reasons behind them, children altered their behaviors; the same could occur among adults. During the door-to-door survey, respondents should not only be asked whether they own a toilet, but also what their sanitation practices are. Surveyors should not simply advise respondents to own a toilet, but also elucidate on why toilet utilization is crucial for sanitation and mention equally important sanitary measures.

Awareness spreading should go beyond door-to-door conversations to reach community groups and events. Self-help groups, proven agents of female empowerment in Dokur and much of rural India, should seek to discuss sanitation regularly. Not only using a toilet, but also disposing of waste, preparing food safely and maintaining personal hygiene should be emphasized as components of sanitation. The SBA should install independent sanitation committees that lead initiatives and community-wide events, including clean-the-road campaigns and WASH workshops. If Dokur has its villagers and leaders jointly involved in sanitation awareness events, the likelihood of people applying the lessons to their lives exponentially increases. Posters and media tools can further raise awareness of

sanitation, such as spreading the message that OD is disadvantages and toilet usage prevents numerous illnesses.

If the water situation can improve and community awareness enhance, Dokur's bleak sanitation situation can transform to become the stark opposite. If the Swacch Bharat Abhiyan focuses on exterminating the water problems and implementing behavior change solutions in Dokur, it will certainly make a difference in the nutritional and health outcomes of the villagers. Although the sanitation solution may not reach its full effect today, tomorrow or the next ten years, a gradual yet persistent change in behavior has the potential to ignite lasting change.

10. Personal Reflection

"Never doubt that a small group of thoughtful, committed, citizens can change the world. Indeed, it is the only thing that ever has."
-Margaret Meade

As I left the ICRISAT grounds and began my long car ride to the airport, mixed emotions led me to release a flood of tears. I was not the type of person who cried often. Expressed in every tear and sob were feelings of affection, joy, sadness, nostalgia and almost every other feeling a person my age could possibly experience.

I would miss my mentor, Dr. Padmaja, who went above and beyond her required duties not only to be my friend, but also to push me without even saying anything. My first week at ICRISAT I was overwhelmed with her knowledge and wisdom, but by the end of my stay I looked to her as the essence of female strength and empowerment. I would not just miss Dr. Padmaja; all of my Markets, Institutions and Policies colleagues held huge places in my heart. I thought of my other friends at ICRISAT, from the German tango-obsessed birdwatching Thomas to the Taiwanese interns who never abandoned their intent to teach me Chinese. I go back to the moment they all promised me that we would meet again. Would we? And then I remembered the ICRISAT man I shook hands with daily on my way to lunch. It sounds ridiculous, but I was sad that I would not be shaking his hand any longer. Would he too forget me?

Most heartbreaking of all was recalling when the villagers from Dokur asked me to return. Would I ever be back? Unfortunately, reality indicates the unlikelihood of such a visit, but despite not physically returning, every interaction and lesson lays firmly within my heart. It was in the village I learned that food insecurity extends beyond food inaccessibility, using open defecation and sanitary disregard as its pungent weapons. Villagers faced incomprehensible struggles while simply trying to relieve themselves, which caused poor health, female disempowerment and little hope for improved circumstances. Water, a commodity I drink unlimited quantities of, hampered the villagers' potential to overcome their difficulties. Although this was merely one village in a country of over one billion, I still wondered: Why did no one in my hometown know of this injustice? Or, if they did know, why did they not act in response?

While I am only one person, and one person can only do so much, this internship proved to me that youth and inexperience are no excuse for forgoing social responsibility. I may not have solved the intermingled difficulties of Dokur Village; I may not have done anything that the people will remember five or ten years from now. What was the point, then? How could I have made a difference if it had no far-reaching effects? That is the beauty of it. Making a difference is not about going all out and "changing the world," but influencing a small group of people at a given time. It is about planting seeds, even though you may not witness the plants come to their full bloom. I used my time in the village to prove to the people that I cared about them, from eating with my hands to wearing a saree, teaching the children songs and encouraging the young women never to surrender their educational goals. My favorite moment was giving four plates to a family who only owned two plates to feed their many hungry mouths. A look of gratitude, indiscernible to the naïve eye, penetrated the daughter's face as she received my simple gift. India will now only dwell in my memory, but it has taught me that making a difference is possible when I vest faith in each seed I plant.

11. Village Experience in Color

My last day in Dokur, my village friends brought me to the temple for a photo session wearing my saree!

It was a treat to visit the schoolchildren, who followed me around hoping to be featured in a photo. I took too many to count.

Here is one of the forty females I interviewed for my survey. Just look at that smile!

Fully experiencing village life meant getting my hands dirty transplanting paddy. Did I entirely know what I was doing? No.

The highlight of my time in Dokur was giving this girl four plates for her family. It made me so happy!

I hosted the female focus group discussion in the carefree atmosphere of my village bedroom.

12. Bibliography

Anupama, GV, Cynthia Bantilan, and Uttam Deb. “Drivers of Change: Dynamics of Rural Livelihoods and Poverty in SAT India.” 2011. Print.

Babu, P., P.D. Bidinger, and B. Nag. "Nutritional and Health Consequences of Fluctuations in Household Food Availability." *United Nations University*. United Nations University, n.d. Web. 13 July 2016.

Bathran, Ravichandaran. “Indian Sanitation.” *Economic and Political Weekly* 46.51 (2011). 34-37. Web.

Cairncross, Sandy, and Vivian Valdmanis. "Chapter 41: Water Supply, Sanitation, and Hygiene Promotion." *National Center for Biotechnology Information*. U.S. National Library of Medicine, 2006. Web. 13 July 2016.

Chambers, Robert, and Gregory Von Medeaza. "Sanitation and Stunting in India: Undernutrition's Blind Spot." *Economic and Political Weekly* 48.25 (2013): 15-18. Web.

Coffey, Diane et. al. "Open Defecation: Evidence from a New Survey from Rural India." *Economic and Political Weekly* 49.38 (2014): 43-55. Web.

"Creating Demand for Toilets in Rural India." *SlideShare*. India Water Portal, 24 Feb. 2015. Web. 13 July 2016.

DeWitt, Sarah. "Agricultural Improvements in the Semi-Arid Tropics: An Interview with ICRISAT’s Dr. William Dar." *Food Tank*. Food Tank, 8 Dec. 2013. Web. 13 July 2016.

Gopal, P.V. Satya, and B. Vijayabhinandana. "Agriculture- A Tool for Empowerment." *India Research Journal of Extension Special Issue* 1 (2012): 99-104. Web.

Harris, Jody, and Anna Herforth. *From Agriculture to Nutrition: Pathways and Principles*. Proc. of Agriculture and Nutrition Global Learning and Evidence Exchange, Uganda, Kampala. Print.

Kumar, Shreshtha et. al. “Improving Sanitation and Hygiene Practices of the Rural Poor through Community Institutions in Uttar Pradesh, India”. Process Documentation, ICRW, New Delhi. 2015.

Lastarria-Cornhiel, Susana. Proc. of World Development Report 2008: "Agriculture for Development", World Bank, Washington D.C. N.p.: n.p., 2008. Print.

"Overview." *International Crops Research Institute for the Semi-Arid Tropics*. ICRISAT, 04 Dec. 2015. Web. 13 July 2016.

Padmaja, R. "A Discussion on Gender Empowerment, Education, and Nutrition." International Crops Research Institute for the Semi-Arid Tropics. Patancheru. 23 June 2016. Lecture.

Rama, Krishna N. et. al. “Dokur Village at a Glance.” India: International Crops Research Institute for the Semi-Arid Tropics. 2011. Print.

Sharma, Neetu C. "Modi's Swachh Bharat Mission Has Built 80 Lakh New Toilets- But Few People Are Using Them." *Mail Online India*. Associated Newspapers Limited, 13 Aug. 2015. Web. 13 July 2016.

Sraboni, Esha. *Women's Empowerment in Agriculture and Intrahousehold Nutritional Well-being: Evidence from Rural Bangladesh*. N.d. Print.

Walker, T. S., and James G. Ryan. *Village and Household Economies in India's Semi-Arid Tropics*. Baltimore: Johns Hopkins UP, 1990. Print.

“Water, Sanitation and Hygiene Annual Report.” *United Nations Children’s Fund*. UNICEF, 2006. Web. 13 July 2016.

"The World Factbook: India." *Central Intelligence Agency*. CIA, 05 July 2016. Web. 13 July 2016.

Appendix 1

A Case Study on the Nutritional and Health Outcomes of Governmental Sanitation Campaigns in Dokur Village

VDSA Household ID										

Date of Interview (DD/MM/YYYY): _ _ / _ _ / _ _ _ _

Start Time (24 hour format): _ _ : _ _ End Time: _ _ : _ _

Demographic Data		
Question	Respondent	Husband
Name		
Member ID		
Age		
Education level [a]		

a. Codes for education level
A. Illiterate B. Primary (class 1-4) C. middle (5-8) D. secondary (9-10) E. higher secondary (11-12) F. Graduation (finished 12) G. Post-graduation (attended a university)

Number of household members	Children between 0-5 years of age	All other family members currently living in the home (children above five years, parents, extended family)
Average annual income of the household (2015-2016)		If the average is unavailable, leave blank; get from VDSA data

Decision making: household related Includes making choices on child education, food allocation, and practices within the home		A. Self B. Husband C. Joint D. Other_____ **Ask for examples of the household decisions she and her husband each perform**
Decision making: agriculture related Able to choose agricultural planting and employment and distribute its earned income		

Do members of your household belong to any groups? Yes / No If yes,

Name of the member	Group name	Since when	In what capacity

Basic Sanitation Data		
What is the greatest sanitation problem your family is facing? Explain.		
What is the greatest sanitation problem your community is facing? Explain.		
Where have you learned most about sanitation? [b] What did you learn?		
b. Codes for sources of sanitation information A. Anganwadis B. School C. Friends D. Family E. Neighbors F. Media (television, posters, internet, etc.) G. Government program (Total Sanitation Campaign, Nirmal Bharat Abhiyan, and Swacch Bharat Abhiyan) H. No one		
How easy is it to access drinking water?		A. Very easy B. Easy C. Sometimes difficult D. Moderately difficult E. Very difficult **Ask both drinking water questions before beginning the non-drinking water questions.**
How easy is it to access non-drinking water?		A. Very difficult B. Moderately difficult C. Sometimes challenging D. Easy E. Very easy
Where does your family access drinking water?		A. Bottled water B. Piped or tap water C. Well D. Rainwater collection E. Surface water (tank or pond) F. Other surface water (river, dam, stream, canal, lake, etc.) G. Other: _____
Where does your family access non-drinking water?		

Nutrition/Health Data		
What are the five most commonly eaten foods in your home, with one being the most eaten and five being the least?		
What do you do with leftover food after a meal? How and where do you store it?		
Did any members of your household fall sick in the last fifteen days? Yes/No If yes,	Sickness in this context refers to waterborne illnesses like diarrhea, cholera, malaria, and typhoid. **If the respondent answers this question, skip the following question.**	
Member name	Frequency of illness	Type of illness
Did any members of your household fall sick in the last month? If yes,		
Member name	Frequency of illness	Type of illness
Do you think your children are getting enough nutrition? Why or why not?		

Open Defecation Data				
What are some of the challenges you have faced while openly defecating?				
Do you own a toilet? If yes, are you still using it? Why or why not?				
Do you prefer using a toilet or defecating outside? Why or why not?				
Do people in your village still defecate in the open? Yes/No If yes,				
Percent of males who openly defecate	Percent of females who openly defecate	Percent of children who openly defecate	Reasons for their open defecation	
How close to your home do people openly defecate?			A. On property B. Next to property C. A couple houses away D. Within the neighborhood E. None F. Other: _____	

Toilet Owner Data		
What year did you have your toilet built?		
Were you the first generation of your family to own a toilet?		
What are/were your family's top three reasons for owning a toilet? Rank them from one to three, with one being the strongest reason. [c] Explain your choice.		
c. Codes for reasons to own a toilet A. Convenience B. Privacy/Dignity C. Comfort D. Health/Sanitation E. Guest use F. Improvement of social status G. Government subsidies H. Other: _____		
From one to five, one being the easiest and five being the most difficult, how challenging was it for your family to have a toilet built? Explain.		
Who in your family chose to have a toilet built?		A. Self B. Husband C. Children D. Elderly E. Other
Who are/were the primary users of the toilet?		
Rate the cleanliness of your toilet from one to five, one being the least clean and five being the most. Explain your choice.		
Which is/was better: your toilet at home or the public ones in the village? Why?		
Do you know about the Total Sanitation Campaign, the Nirmal Bharat Abhiyan, or the Swacch Bharat Abhiyan? Yes/No	The government created several sanitation campaigns to subsidize toilets and encourage positive sanitation habits. The Total Sanitation Campaign took place from 1999-2012, while the Nirmal Bharat Abhiyan occurred from 2012-2014. The Swacch Bharat Abhiyan is happening now. **If respondent answers no, do not ask the remaining questions.**	
Do most people in your community know about the Total Sanitation Campaign, the Nirmal Bharat Abhiyan, or the Swacch Bharat Abhiyan? Yes/No		
How did you come to know this program? [d]	How did you participate in this program? [e]	How did you benefit from this program? [f]
d. Codes for how respondent came to know program A. Friends B. Neighbors C. Government (specify) D. Television E. Posters or print advertisements F. Community group G. Other: _____		
e. Codes for how respondent participated in program A. Attended a meeting B. Considered having a toilet built C. Participated in a government campaign D. Had a toilet built		
f. Codes for program benefits A. Learned sanitation practices B. Received partial funding for toilet (ask for amount) C. Received full funding for toilet D. Did not benefit		

Non-Toilet Owner Data		
What are your top three reasons for not owning a toilet? Rank them in order from the strongest reason to the third strongest reason. Explain your choices.		A. Construction cost B. Maintenance cost C. Water maintenance D. Overflowing E. Lack of health benefits F. Bad odor G. Attracts flies H. Other people use it I. Does not satisfy religious standards
Who in your household wants a toilet, if anyone?		A. Self B. Husband C. Children D. Elderly E. Other
Do you have access to a toilet outside your home? If yes, do you use it? Why or why not?		
If you were required to build a toilet and had the resources to build any style, would you choose one from the government or construct one yourself? Explain.		
Do you know about the Total Sanitation Campaign, the Nirmal Bharat Abhiyan, or the Swacch Bharat Abhiyan? Yes/No	The government created several sanitation campaigns to subsidize toilets and encourage good sanitation habits. The Total Sanitation Campaign took place from 1999-2012, while the Nirmal Bharat Abhiyan occurred from 2012-2014. The Swacch Bharat Abhiyan is happening now. **If respondent answers no, do not ask the remaining questions.**	
Do most people in your community know about the Total Sanitation Campaign, the Nirmal Bharat Abhiyan, or the Swacch Bharat Abhiyan? Yes/No		
How did you come to know about this program? [d]	How did you participate in this program? [e]	How did you benefit from this program? [d]
d. Codes for how respondent came to know program A. Friends B. Neighbors C. Government (specify) D. Television E. Posters or print advertisements F. Community group G. Other: _____		
e. Codes for how respondent participated in program A. Attended a meeting B. Considered having a toilet built C. Participated in a government campaign D. Had a toilet built		
f. Codes for program benefits A. Learned sanitation practices B. Received partial funding for toilet (ask for amount) C. Received full funding for toilet D. Did not benefit **Proceed to last question only if the respondent has received subsidies for a government toilet (choice B or C)**		
Explain why you do not have a toilet now.		

Appendix 2

A Case Study on the Nutritional and Health Outcomes of Governmental Sanitation Campaigns in Dokur Village

Focus Group Discussion Questions

Featured Group: Adult Men *Number of Participants: _____*
Date of Discussion (dd/mm/yyyy): _ _/ _ _ / _ _ _ _
Start Time (24 hour format): _ _ : _ _ *End Time: _ _ : _ _*

1. What are the five most commonly eaten foods in your village, with one being the most eaten and five being the least?

**Give flashcards with FAO food groups to each participant so they can order the foods as they see fit.*

2. What do you think is most important for your children's health during their first five years (possible choices: nutritious food, clean water, sanitation, exercise, doctor visits and prescriptions, personal care, early childhood breastfeeding)?
3. Do members of your community defecate in the open? What are the advantages of doing it?
4. Do you think there are advantages to owning a toilet? How so?

**Give each participant two different colors of paper to submit in a secret ballot, with one color of paper signifying advantages to open defecation and another showing that there are none.*

5. Do you and your family members clean your hands after defecating? If yes, what do you clean them with (possible choices: soap and water, water, ash)? Why do you clean them?
6. Do you know about the Total Sanitation Campaign, the Nirmal Bharat Abhiyan, or the Swacch Bharat Abhiyan? If yes, how did you come to know about this program? Do most people in your village know about these programs?
7. What do you think is the greatest sanitation problem your community is facing?

A Case Study on the Nutritional and Health Outcomes of Governmental Sanitation Campaigns in Dokur Village

Focus Group Discussion Questions

Featured Group: Adult Women *Number of Participants: _____*
Date of Discussion (dd/mm/yyyy): _ _/ _ _ / _ _ _ _
Start Time (24 hour format): _ _ : _ _ *End Time: _ _ : _ _*

1. What are the five most commonly eaten foods in your village, with one being the most eaten and five being the least?

**Give flashcards with FAO food groups to each participant so they can order the foods as they see fit.*

2. Do you usually clean food before preparing it to eat? Explain (in detail) how you clean grains (cereals and pulses), vegetables, green leafy vegetables, and fruits.
3. Where does your family access drinking water and non-drinking water?
4. How easy is it to access drinking water, with one being the easiest and three being the most difficult? How does that compare with your access to non-drinking water?

** Each participant should receive two small, two medium and two large pieces of string. For each question, they answer by turning in the size string fitting the choice (smallest string is easiest access, medium string is sometimes difficult and largest strong is most difficult).*

5. What do you think is most important for your children's health during their first five years (possible choices: nutritious food, clean water, sanitation, exercise, doctor visits and prescriptions, personal care, early childhood breastfeeding)?
6. Do you and your family members clean your hands after defecating? If yes, what do you clean them with (possible choices: soap and water, water, ash)? Who taught you how to clean them?
7. Do you know about the Total Sanitation Campaign, the Nirmal Bharat Abhiyan, or the Swacch Bharat Abhiyan? If yes, how did you come to know about this program? Do most people in your village know about these programs?
8. What do you think is the biggest sanitation problem in your community?

A Case Study on the Nutritional and Health Outcomes of Governmental Sanitation Campaigns in Dokur Village

Focus Group Discussion Questions

Featured Group: Adolescent Girls *Number of Participants: _____*
Date of Discussion (dd/mm/yyyy): _ _/ _ _ / _ _ _ _
Start Time (24 hour format): _ _ : _ _ *End Time: _ _ : _ _*

1. Do you have a nutrition or health class in your school? If so, what have you learned there?
2. How often do you become sick? What sicknesses do you usually have?

* Hold a silent ballot in which the participants close their eyes and vote. Use different colored paper for each choice: weekly, every other week, once a month and rarely.

3. When do you wash your hands? What do you use to clean them and why?
4. Do you think using a toilet is good for your health? Why or why not?

**Tell the girls to walk to one side of the room if they think a toilet is good for their health; if they do not think so, then they must walk to the other side of the room.*

5. Do you have separate toilets in your school for boys and girls? What are they like?
6. Who cleans the toilets in your school?
7. What experience with toilets do you have at home?
8. Would you rather use a toilet or go outside?
9. Do you wish less people in your village defecated outside?
10. Do you know anything about the government building toilets in your community? What do you know about it?

Appendix 3

IRHS Nurse Interview

1. Name: _____
2. Founding year of clinic: _____
3. First year of employment at clinic: _____
4. Number of patients annually: ____
5. How expensive is it for villagers to visit this clinic for a checkup? How does that compare to the price for medications?

_____

_____

6. What are some of the common health problems in the village?

_____

_____

7. What vitamin and mineral deficiencies do you commonly diagnose in women villagers? What about children?

_____

_____

8. What is the prevalence of childhood stunting and wasting in the village?

_____

_____

9. What percentage of your child patients are malnourished? _____
10. What do you think causes most cases malnutrition in Dokur?
11. What do you usually prescribe to treat malnutrition and diarrhea?

_____

_____

12. What sanitation practices do you teach villagers? How often do you teach them?

_____

_____

13. What do you believe is the greatest sanitation problem in this village? Why?

_____

_____

14. Do you think the village's poor sanitation and open defecation habits contribute to malnourishment?

_____

_____

15. Has the Swacch Bharat Abhiyan worked with the clinic to promote sanitary practices? If so, what have they done here?

_____

_____

16. How has the water shortage of Dokur limited the practices of your clinic?

_____

_____

ICDS Anganwadi Worker Interview

1. Name: _____
2. Anganwadi building name: _____
3. Number of beneficiaries at Anganwadi: ____ children and ___ pregnant and lactating mothers
4. Does this Anganwadi receive funds from a non-governmental organization or the government? Explain.

_____
_____

5. How frequently do people attend this Anganwadi?

_____

6. What are common reasons why some people do not attend meetings on a regular basis?

_____
_____
_____

7. Does this facility provide food for participants? List all types of foods you serve:

_____
_____
_____
_____
_____
_____

8. What are some of the common dietary deficiencies and illnesses people at your facility often suffer from?

_____
_____
_____

9. What do participants normally learn here?

_____
_____
_____

10. What is being taught about sanitation and hygiene at this Anganwadi? How often are these subjects included?

_____
_____

11. Did the Swacch Bharat Abhiyan introduce any activities here? If so, what were the activities and how did they impact the participants?

_____
_____
_____

12. Rate from one to five, one being the worst and five being the best:
    - Toilet cleanliness: ___

- Teaching room cleanliness: ___

13. Is there drinking water at all times here? What source does it come from?

_____

_____

14. How often is there soap in the bathrooms?

_____

15. Who cleans the bathrooms here, and how often?

_____

16. Do you see children at your school defecating outside? If so, how often?

_____

_____

17. What do most parent participants at your Anganwadi think of sanitation and cleanliness? What are their common sanitary practices?

_____

_____

18. What, if any, improvements have you observed in your Anganwadi's sanitation levels since you began working here?

_____

_____

19. Do you think your Anganwadi is improving the sanitation and health of kids and their parents? Why or why not?

_____

_____

School Headmaster Interview

1. Name: _____
2. School name: _____
3. Total number of students at school: _____
    - Number of boys at school: _____
    - Number of girls at school: _____
4. Subject respondent teaches: _____
5. Grade level(s) respondent teaches: _____
6. Years of teaching experience in village: _____
7. Are there non-governmental organizations helping your school? If so, what do they do?

_____
_____
_____

8. Does your school provide food for its students? If yes, list the top five foods you serve.
    1) _____
    2) _____
    3) _____
    4) _____
    5) _____
9. Explain as best you can how your school disposes of solid and liquid waste.

_____
_____
_____

10. Do most children attend school every day? Explain why some may miss school.

_____
_____
_____

11. How often do children at your school fall sick? What are they most often sick from?

_____
_____

12. Is there a health or sanitation class here? If yes, what do children usually learn? How often is the class taught?

_____
_____

13. Rate from one to five, one being the worst and five being the best:
    - Toilet cleanliness: ___
    - Classroom cleanliness: ___
14. Is there drinking water at all times at your school? What source does it come from?

_____
_____

15. How often is there soap in the bathrooms?

_____

16. Who cleans the bathrooms at your school, and how often?

_____
_____

17. What is the usual attitude of the students towards hygiene and cleanliness?

_____
_____

18. Do the teachers here practice good sanitation and set examples for the students?

_____
_____

19. Which age group of kids do you think has the best sanitation habits? Explain your choice.

_____
_____
_____

20. What are the hand washing practices of the children, and who is teaching them?

_____
_____

21. Do you see children at your school defecating outside? If so, how often?

_____
_____

22. Did the Swacch Bharat Abhiyan introduce any activities to your school? If so, what were the activities and how did they impact the students?

_____
_____

23. What, if any, improvements have you observed in your school's sanitation since you began teaching here?

_____
_____

24. Overall, do you think the school is improving the sanitation habits of the children? Why or why not?

_____
_____
_____

25. What do you think is most important for improving the sanitation of your school?

_____
_____
_____

Sarpanch Interview

1. Name: _____
2. Tenure:
    - Starting Year: _____
    - Ending Year: _____
3. Trash and dung are abundant throughout the village. What have you and fellow officials done to clean the excess waste?

_____
_____

4. What has the Gram Panchayat done to promote the Swacch Bharat Abhiyan in Dokur?

_____
_____

5. How have the people in the village responded to the Swacch Bharat Abhiyan?

_____
_____

6. Why did so many villagers apply to the Swacch Bharat Abhiyan but not receive funds?

_____
_____

7. Do you believe Dokur can reach a high level of sanitation and abolish its open defecation habits? Yes/No
    - Do you envision the village receiving the prestigious Nirmal Gram Puraskar in the future? What steps must be taken to achieve "nirmal" status?

      _____
      _____
      _____

8. What has the Gram Panchayat done to clean the dirty water lanes that run through the village?

_____
_____

9. What overall sanitary improvements have occurred in the village since you began office?

_____
_____

Appendix 4

Emerging Viewpoints from Adults Males Focus Group Discussion
30 July 2016

Prompt	Summarized Response
Most important contributors to children's health during first five years	Children need milk, good and nutritious food and neat surroundings. From zero to two years of age, infants need Celox. Afterwards, they should consume green leafy vegetables, boiled eggs, and milk. Children's surroundings should be clean, so the village drainage should be periodically cleaned and bad smells should be removed.
Advantages to owning a toilet	The men have growing children and realize that the village open defecation area is gradually becoming smaller. Also, mosquitoes and flies are common while openly defecating.
Knowledge of Swacch Bharat Abhiyan	They know about the campaign from the television, newspaper and the Gram Panchayat's door-to-door survey. Some in the village benefitted from the program, while most did not, and the respondents are unsure of the reason why. Those from the group who went to the Gram Panchayat's meeting about the campaign said that if homes construct the basic level for a toilet, the government will fund the second stage of its development. Many homes have built the first level of their lavatory, so are now waiting for government funds.
Greatest sanitation problem in village	Most households do not have toilets, but an equally important issue is the village drainage system. The Gram Panchayat used to have the drainage cleaned monthly, but now only does it annually through the recruitment of two to three shovelers. Villagers continue to throw dust everywhere, which makes the entire area very dirty.
Hand washing habits	They wash their hands with water before eating and after working. Some do so after defecating, yet few admit to it.

Reasoning behind open defecation	The respondents are habituated to doing it. Some fear their toilet septic filling, so make the safe choice of going outside instead. Besides, it is relaxing and comforting. One even claimed that in the village, open defecation incites feelings of freedom that could never be found in the city. However, some admitted that the rainy season brings problems, even to seasoned open defecators.
Reasoning behind stunting and child malnourishment in the village	Children's health is directly related to the nutrition they are receiving at home. If they eat well, they will grow tall, and vice versa. They also believe there are genetic reasons behind height, and that milk plays a special role in tallness. The respondents believe that the village nutrition is enhanced by the foods given out to young children and pregnant and lactating mothers by the Anganwadis workers.

Emerging Viewpoints from Adult Females Focus Group Discussion
30 July 2016

Prompt	Summarized Response
Method of cleaning foods	Vegetables: First they cut raw vegetables, then they clean them and put them aside. Grains: They add grains to water and then pour more water on them. Rice: They clean rice two times because it is often dirty, then they begin cooking it. Respondents clean food items for five minutes or less.
Access to drinking and nondrinking water	They access personal tap connections for water drinking, with some filtering the water before consumption. Nondrinking water comes from the same source.
Difficulty of accessing drinking and nondrinking water	The Sarpanch ensures that the village is getting enough water, but receiving water once every four days for an hour and a half is not enough for a lot of people.
Most important contributors to children's health during first five years	Children need nutritious food in different formulas and good milk for their first one to two years. Cleanliness and sanitation during their first five years is not critical.
Greatest sanitation problem in village	The village drainage system is not being cleaned. The past Sarpanch ensured it was cleaned well, but the current tenured officer is only doing it once a year. This creates a tremendous problem, since flies and mosquitoes are now abundant in the area.
Knowledge of Swacch Bharat Abhiyan	All respondents know about the program, that the government promised to build toilets for the community but did not keep their word. The Gram Panchayat did a door-to-door survey asking households if they had toilets; if they did, then the surveyors would leave; if they did not, they would be asked to consider receiving a toilet subsidy. The sanitation program did not spread information about the health benefits of toilets, but rather persuaded homes with low incomes to have a toilet built. Many people applied for the program, but few benefitted.
Hand washing habits	They wash their hands usually without soap before eating and after fieldwork. Any women only wash their hands twice a day.

Emerging Viewpoints from Adolescent Girls Focus Group Discussion
27 July 2016

Prompt	Summarized Response
Health and nutrition information learned at school	Students learn from their teachers to eat a variety of fruits and vegetables and avoid deep-fried items, which will enable adequate consumption of protein, fiber, vitamins and minerals. They cited two glasses of milk, one egg and green leafy vegetables as necessary agents for good health. They claim that being healthy furthers their study goals and future.
Sanitation information learned at school	Students know to bathe, wash their hands before eating, cut their nails, brush their teeth, wear washable clothing, clean their surroundings and drink five to six liters of water daily from their bioscience teacher's lectures.
Frequency of personal illnesses	Most claim that they are ill less than once per month.
Personal hand washing habits	They typically wash their hands with soap before eating and after defecating, dirty work and games.
School hand washing situation	Students wash their hands only before eating and after using the bathroom.
Health benefits of toilet usage	All said that toilets are beneficial for personal health and hygiene. They say that using a toilet prevents exposure to mosquitoes and flies encountered during open defecation. It helps avoid diseases such as malaria, typhoid, and contagious illnesses.
Toilet situation at school	The respondents use them, but are sometimes limited because of the village water situation. Water comes only once every five days.
Frequency of toilet cleaning at school	A sweeper comes and washes the toilets every five days.
Home toilet experience	Three of the eight respondents have toilets at home. Those who have toilets say that their home facilities are much cleaner than the ones at school.
Toilet preference	All prefer using toilet because open defecation creates guiltiness and causes

	diseases. Also, open defecation occurs in an open environment is an uncomfortable act.
Knowledge of Swacch Bharat Abhiyan	Each respondent knows about the program. They learned about it from television, and later became involved in the school's campaign. They learned to create compost for dust instead of throwing it away and to wash their hands before eating and after openly defecating. The teachers taught them irregularly for fifteen days about the campaign.

Appendix 5

Focus Group Sanitation Discussion Comparisons

	Adult Men	**Adult Women**	**Adolescent Girls (ages 12-18)**
Most important contributors to 0-5 year-olds' health	Nutritious food, breast milk, clean surroundings	Nutritious food, breast milk formulas	*Not Asked*
Typical hand washing materials	Water	Water	Water, soap if possible
Hand washing times	Before eating, after fieldwork	Before eating, after fieldwork	Before eating, after work, after defecation, after games
Reasons for Toilet Usage	Open defecation area is unclean and growing smaller; growing children need privacy	*Not Asked*	Open defecation is unclean, unsafe, uncomfortable and causes guiltiness
How they know about the Swacch Bharat Abhiyan (SBA)	Newspapers, television, Gram Panchayat door-to-door survey	Television, Gram Panchayat door-to-door survey	Television, school
What they know about the SBA	Government toilet subsidies allow the poor to construct toilets if they first complete a base construction.	Government toilet subsidies allow the poor to construct toilets if they first complete a base construction	A government program taught the students to compost and to wash their hands before eating and after defecating.
Effect of SBA on village	Few received toilet subsidies out of the many that applied	Few received toilet subsidies out of the many that applied	Improved student cleanliness habits
Greatest village sanitation problem	Unclean drainage system, lack of toilets	Unclean drainage system	*Not Asked*

Appendix 6

Interview with a Nurse at the Institute for Rural Health Studies (IRHS) Clinic

29 July 2016

This nurse was also one of the forty respondents for the sanitation survey. She was the only individual I was able to interview in complete English.

Prompt	**Summarized Response**
Founding year of clinic	2000
First year working with IRHS	1993
Number of patients annually	About one hundred
Price of visiting clinic and receiving medications	It costs nothing to obtain medications, while consultations cost 10 rupees. Children are free. IRHS is affordable for villagers because the government heavily subsidizes it.
Common village health problems	Many patients have epilepsy, which is observed by their seizures. Also, villagers frequently have body pains and gastric problems.
Common childhood health problems	Children suffer from malnutrition and diarrhea. The clinic can often tell their poor nutritional status by observing the children as tired, thin, and not looking well.
Vitamin and mineral deficiencies in women and children	Iron deficiency (anemia)
Prevalence of child patients childhood stunting and wasting in village	It is not unusual to find cases in young children, especially when their parents are busy at work and do not spend time focusing on nutrition.
Percent of child patients in clinic malnourished	Fifty percent, which is about thirty children.
Causes of malnutrition	People's diets are inadequate, both in macronutrients and micronutrients. It is first most important to add to the quality of their diets. Sanitation practices, like ending open defecation and limiting village uncleanliness, can certainly play a role in curbing malnutrition rates.
Treatments for malnutrition and diarrhea	Clinic gives counseling about hygiene to the patient and one's parent and may give special potions for nutrition.

Educational class offered at clinic	For one hour every Wednesday, someone teaches a class about malnutrition and diarrhea to visiting patients.
Home visit description	Mondays and Thursdays for two hours each, the clinic visits patients' homes to check up on them.
Effect of open defecation and village uncleanliness on child's health	Nutrition is most important for children's health, but sanitation still plays a major role.
Presence of Swacch Bharat Abhiyan at clinic	Campaign has not worked with the clinic, probably because the clinic promotes sanitary practices already.
Effect of water problem on clinic	During the summer are the greatest problems. Sometimes the clinic purchases water during times of scant supply. Employees wash their hands with water before eating, using the toilet and before examinations.
Greatest sanitation problem in village	Water shortage is a major problem, which limits the toilet use of many people.

Interview with an ICDS Anganwadi Worker
28 July 2016

Prompt	**Summarized Response**
Anganwadi building name	Center 1
Number of beneficiaries	Twenty-one children and ten parents
Funding source	Anganwadi is completely funded by the government. Monthly the mandal (district office) holds a meeting to decide the Anganwadi rules, with three Anganwadi officials in attendance.
Frequency of participants' attendance at Anganwadi	Monthly the Anganwadi records the height and body of children, then talk to their parents about suggestions for improving their health. They distribute food to the parents for the children's consumption as well.
Reasons participants may skip Anganwadi meetings	All participants try to attend the Anganwadis because either they receive food (as pregnant or lactating mothers) or their children do. Sometimes, people cannot come because of pregnancy emergency or extended work migration. Children may not be able to come because of diarrhea, vomiting, and other waterborne diseases.
Food facility gives to participants	
Common dietary deficiencies and illnesses from which participants suffer	Iron deficiency is most common because the common village diet does not provide enough iron. To compensate, Anganwadis provide iron-fortified snacks.
Lessons participants learn at facility	Anganwadi tells people to take rest and daily eat an egg, green leafy vegetables and other nutritious items, including the food the center provides.
Facility's teachings about sanitation and hygiene	Facility tells patients to bathe, comb their hair, wear washable clothing, cut their nails and clean their hands with soap after defecation.
SBA presence in Anganwadi	Before SBA, the place was already teaching about sanitation and personal hygiene. The Sarpanch conducted a meeting with three Anganwadi workers and told them to focus on cleanliness and using dustbins as part of the SBA, but nothing more.

Cleanliness of Anganwadi building (one to five, one being the least clean)	Four: Children five and under are very unclean and will openly defecate whenever nature calls. If it were not for children's unsolvable habits, the place would be perfectly sanitary.
Drinking water accessibility	Anganwadi has tap water, just like the rest of the village. It is available at all times for participants.
Prevalence of OD in facility	OD occurs every day because if children want to relieve themselves, they do.
Attitudes of parent participants on sanitation and cleanliness	Pregnant and lactating mothers (the only parent participants) are usually open to Anganwadi suggestions. They commonly clean their house and boil water for safe consumption and monthly visit the doctor and obey his orders.
Sanitation improvements observed in Anganwadi	None: only overall improvement is that the place is receiving more food and improving its building structure because of additional government funding
Improvements observed in sanitation and health of children and parents at Anganwadi	Weekly the Anganwadi visits the children's household and teaches sanitation and health to the parents as a government mandate. They are able to reach the mother of the child by promoting good practices to her.

Interview with the School Headmaster

26 July 2016

I conducted this interview with the input of the school headmaster along with four of his faculty members. The headmaster individually answered few, if any, of the questions, allowing his cohorts to provide the majority of the responses.

Prompt	**Response**
School name	Dokur School (first through tenth standard)
Total number of students at school	Seventy boys and eighty girls
Presence of NGOs or governmental programs at school	No NGOS are involved, but the Swacch Patchala (SBA program for schools), Midday Meal Scheme (free meals for all students) and Pada Bharat Bade Bharath (tree-planting program) have programs.
Food school serves to students	Rice daily, pigeonpea dal daily, vegetables daily, egg twice a week and banana once a week
Method of school waste disposal	Compost pit kept by the students
Frequency of children missing school	In each class there are two to three children who are not in attendance. Reasoning is either parent migration or illness.
Types of sicknesses children have	During the rainy season especially, children contract diarrhea or fever.
Description of health/sanitation class	People from the health clinic come twice a week to teach sanitation to the students. All teachers also teach health education twice per month along with their own subject.
Toilet cleanliness rating and classroom cleanliness rating (one to five, one being the least clean)	Toilet is three and classroom is four: Starting this year, there is no sweeper (janitor) to clean the toilets and classrooms, so students and teachers now join together to clean. The school has a WASH committee for this purpose.
Water availability	School has no water facility, which hinders the full use of their toilets. They have asked the Sarpanch many times to improve their water access, but to no avail. The water problem originated from the drought three years ago, and continues to this day.
Soap availability	Soap is only available for kids to use before lunch.

Attitude of children towards hygiene and cleanliness	Children follow the school rules on cleaning their hands with soap, cutting their nails, and using a toilet when they can. When they go home, they revert to the rules their parents impose on them.
Sanitation examples of teachers	Teachers follow sanitation in their curriculum. The bioscience teacher especially educates the students on sanitation.
Age group of children with the best sanitation habits	Ten to fourteen-year-olds have the best sanitation habits because they consistently comb their hair, bathe and brush their teeth
Hand washing practices of children	Children learn health and hygiene habits, like properly washing their hands, starting in the third standard. They rub soap and water with their hands and wait for a foam substance to form before washing the solution off with more water
Prevalence of open defecation at school	Open defecation happens frequently due to water shortages hindering full use of the toilets
SBA presence at school	Teachers promoted the SBA by teaching children to use dustbins and reinstating that toilet use is beneficial for health.
Whether or not school is improving the sanitation habits of children	Yes
Most important factor for improving school sanitation	School needs a water facility and sweeper

Interview with the Village Sarpanch

27 July 2016

The Sarpanch is the elected leader of Dokur Village. He comes from a very wealthy household, as attested by the tile flooring, westernized kitchen table and flat screen television in his residence. His family's wealth comes from the agriculture and livestock grown on one of the village's largest parcels of land. Interestingly, it is his wife who is technically the Sarpanch. People voted her name into office, but because of traditional village perceptions, her husband attends all the Gram Panchayat meetings and makes the important decisions. She is only needed to sign documents officially and to represent female empowerment to the locals and the higher Indian government.

Prompt	**Summarized Response**
Tenure	2014-2019
Actions of the Gram Panchayat (GP) to clean excess village waste	Sarpanch has the dry village lanes cleaned periodically.
Promotion of the Swacch Bharat Abhiyan (SBA) in the village	GP conducted a door-to-door survey, going to every home promoting sanitation and persuading households to receive toilet subsidies. The campaign encouraged the villagers to clean their household, outdoor buildings, and animals, which will prevent bugs from hovering around.
People's response to the SBA	Response has not been strong, but with a growth in village literacy, the Sarpanch is optimistic.
Whether or not the village can reach a high level of sanitation and abolish open defecation and eventually earn a Nirmal Gram Puraskar (completely clean village award)	It takes time to mend the village's sanitation problems, but with increased literacy, results will continue to improve. The Sarpanch has already done a lot to enhance the villagers' way of life, and he hopes to do much more.
Why so many villagers applied for toilet subsidies from the GP but have not benefitted	The government pays 12,000 rupees for the construction of a household toilet: 6,000 for based construction and 6,000 for the finishing construction. Villagers must complete the base construction before receiving any funds.
Actions done by the Gram Panchayat to clean the village drainage system	Sarpanch recruits laborers every two to three months to remove the dust from the drainage lanes in the village.
Overall sanitary improvements observed since beginning office	He constructed lanes for village water distribution, but is now struggling to receive government funds for toilet subsidies. He also implemented an improved road system for the village.

Appendix 7

Key Informant Comparisons on Sanitation Viewpoints

Respondent	Anganwadis Worker	IRHS Nurse	Sarpanch	School Headmaster
Occupational location	Government Anganwadis	Integrated Rural Health Services village clinic	Entire village	1-10 standard school
Occupational Description	Provides health education and nutrition to infants and pregnant and lactating mothers	Checks up on ill patients and prescribe necessary medications	Rules as the village's top official to make necessary political and economic decisions	Serves as the top official and representative for the village's only school
Sanitary improvements at respondent's facility	Receiving more food and better facilities from government funds, which led to improved sanitation and nutrition	None	Constructed lanes for water and improved road system maintenance	Enforces standards on hand washing, hair combing, dust bin maintenance and sanitation committee rules for students of all grades
Greatest sanitation problem at location	Encounters frequent child open defecation and water shortage constraints	Faces no sanitation problems at location, yet believes water shortage is the leading village crisis	Acknowledges the large amount of illiterates who do not know sanitation practices	Accesses inconsistent water source and has no hired janitor
Method of spreading sanitation awareness	Teaches about bathing, combing hair, cutting nails, and cleaning hands with soap and water	Tells patients necessary cleanliness habits for their respective medical conditions	Conducted the Swacch Bharat Abhiyan campaign, going door to door in the village promising toilets to poor villagers;	Promoted the Swacch Bharat Abhiyan's school campaign, showing students dust bin usage and toilet etiquette

			symbolically cleaned the roads	
Involvement in Swacch Bharat Abhiyan (Y/N)	N	N	Y	Y