Spring 2012

Confronting Agrarian Crisis and Deconstructing Farmer Debt: The Story of Sulthanpur Village, Andhra Pradesh

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SIT Study Abroad

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School for International Training India: Sustainable Development and Social Change Program

Spring 2012

Acknowledgments:

This study could not have been conducted without the guidance of Ram Chandrudru, Surendra X, Shankarama, and others from the Watershed Activities and Services Network who provided me with local support in Andhra Pradesh and helped facilitate this study. Special thanks also go out to all the SIT staff who provided me with academic guidance throughout the planning and implementation process. Finally, to all the families in Sulthanpur who welcomed me into their homes and spoke with me – I am truly grateful for your hospitality and participation in this study. I will never forget your storiesl Finally, to my homestay family in Sulthanpur, particularly my Auntie Ansuja, who welcomed me into her life for two weeks and made me cared for and at home when I was so far away from my own family. In my heart you will always be my Auntie.

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I. Abstract:

In a climate of globalized politics and neoliberal economics, it can be difficult to isolate the impacts of agricultural and economic policy on the lives of the rural poor in India. Hidden behind a veil of economic growth, pro urban, and pro industry governments, the stories of small and marginal farmers have been overlooked in the name of different development priorities. This study endeavors to put the agrarian poor back into the scholarship spotlight by deconstructing livelihood crises and farmer debt in Sulthanpur Village, Andhra Pradesh. This effort is important because although Andhra Pradesh has the highest rate of farmer indebtedness in India, few village level analyses have been preformed.

Through a combination of formal interviewing, direct observation, and case studies, this study found that farmer debt in Sulthanpur can be traced to two phenomena– a crisis of productivity and a crisis of profitability – which are both intimately connected by issues of water scarcity and irrigation investment and simultaneously framed by issues of globalization and agricultural policy. This paper will analyze these two crises in depth as it seeks to understand the role that the search for water, especially through personal investment in borewells, plays in creating perpetual and outstanding debt for farmers. In doing so, this paper will also explore a other contributing factors, including a local widespread shift toward cash crop, linear, input intensive agriculture, the role of informal finance in the local economy, and increasing expenditures for farmers. In discovering the extent of the debt burden in Sulthanur, this study concludes by calling for a partnership between scholarship and activism as a necessary intervention in agrarian crisis.

II. Introduction

In a climate of globalized politics and neoliberal economics, it can be difficult to isolate the impacts of agricultural and economic policy on the lives of the rural poor in India. Hidden behind a veil of economic growth, pro urban, and pro industry governments, their stories can fall through the cracks, especially if they lack the drama of a large social movement or single unifying horror. This disconnect between policy and people, between centers of power and the rest of the country, marginalizes the stories of over 70% of India's population who live in rural areas and depend upon agriculture for their livelihoods.[1] The paradox is that the stories of these farmers can reveal more about the impacts and appropriateness of agricultural development policy than any measurement of growth possibly could.

A. Agrarian Distress: The Indian Context

Countless scholars, officials, and citizens agree that there is currently an agricultural and agrarian crisis occurring in India. The former, which is primarily the concern of growth focused Indian governments and international financial institutions, is manifested through declining agricultural productivity across the country and a declining share of agriculture in the country's Gross Domestic Product (GDP).

While these statistics are important indicators of change, they do not provide the entire picture. The concept of Agrarian crisis, however, in its consideration of people, economics, and the environment, and prioritization of livelihood issues, provides a more holistic understanding of rural and angricultural realities in India. [2] Instead of reducing agricultural change to growth

[1] "India: Priorities for Agriculture and Rural Development," *World Bank*, 2011, http://go.worldbank.org/8EFXZBL3Y0.
[2] Narasima Reddy and Srijit Mishra, *Agrarian Crisis in India* (New Delhi: Oxford University Press, 2009): 88-96.

statistics, the agrarian lens reveals stories of distress induced farmer migration, debt, and even suicide throughout the country. In description of this perspective, R. Radhakrishna, author and scholar, states: "Agrarian crisis is eroding the economic and social foundation of rural India and threatening the stability of the Indian economy and polity." [3]

B. Agrarian Distress: The Andhra Pradesh Context

As mentioned previously, out of the five states experiencing high indicators of Agrarian distress, including Maharashtra, Punjab, Kerala, and Karnataka, Andhra Pradesh ranks highest in measurements of farmer debt and farmer suicide. In Andhra Pradesh, over 80% of farmers are living in debt and since 1997, the state has experienced over 200,000 farmer suicides.

Scholarship and media coverage of this issue has largely limited their scope to that of farmer suicide. While these heartbreaking stories do provide a window into the severity of agrarian crisis, scholars can write obituary upon obituary without ever confronting structural, institutional, and root causes of agrarian distress. As V.M. Rao says in his essay, "Farmers' Distress in a Modernizing Agriculture," "Farmers' distress…is the huge iceberg hiding below the visible tip of suicides."[4] In an attempt to share the bulk of stories that have been fairly marginalized by the drama of suicide, this study chose to focus upon farmer distress as it relates to irrigation and debt in rural Andhra Pradesh. With help from the nonprofit, WASSAN (Watershed Activities and Services Network) which works on rural livelihood issues throughout Andhra Pradesh, Sulthanpur Village, in the Rangareddy District, was chosen as a site to analyze farmers debt burden as it relates to their investments, particularly in irrigation.

[3] Narasima Reddy and Srijit Mishra, *Agrarian Crisis in India* (New Delhi: Oxford University Press, 2009): xviii.
[4]Narasimha Reddy and Srijit Mishra, *Agrarian Crisis in India* (New Delhi: Oxford University Press, 2009):111.

In Andhra Pradesh, rural landscapes have been dramatically restructured since the state liberalized its economy in 1991 and fully liberalized agricultural trade in 1997. New technologies and international agricultural companies flooded the Indian rural economy, bringing with them a host of hybrid seeds and new chemicals, and reorienting local agriculture toward a larger market. Currently, though 70% of farmers in Andhra Pradesh own less than two hectares of land, and over 90% of farmers in Sulthanpur own less than two acres of land, nearly all are engaged in input intensive, market oriented agriculture.[5] Further, as changing policies and technologies have imposed a more expensive, market dependent system of production on small and marginal farmers and removed institutional and economic support systems, like minimum export prices, rural livelihoods have entered into a period of decline.

This decline can be summarized by two phenomena: a crisis of productivity and a crisis of profitability in rural Andhra Pradesh wherein agricultural systems are failing to provide farmers with adequate yield and economic systems are failing to provide farmers with adequate profit.[6]

III. "A Village Level Analysis": Studying Sulthanpur, Andhra Pradesh

In Sulthanpur Village, Andhra Pradesh – the location of this study – the variable of water connects these two crises as water scarcity pushes farmers to take out loans to drill borewells and frequently creates a more severe debt crisis for small and marginal farmers. This paper an analysis of how this water, technology, debt nexus manifests itself in the lives of farmers in Sulthanpur Village, Andhra Pradesh as they experience declining productivity and profitability on their land and in the market. Drawing upon interviews with borewell farmers, rainfed farmers,

[5] Narashima Rao and K.C. Suri, "Dimensions of Agrarian Distress in Andhra Pradesh," *Economic and Political Weekly* 41 (2006): 1546-1552.
[6] Narasima Reddy and Srijit Mishra, *Agrarian Crisis in India* (New Delhi: Oxford University Press, 2009), 164-198.

borewell operators and drilling company owners, money lenders and seed/chemical shop owners, local village organizations, and the state bank, in addition to a few more in depth case studies of farmers, this study explores how water demands and water scarcity, as it is seen through investment in borewell irrigation, connects productivity and profit crises as well as engages farmers into an even stronger cycle of borrowing and debt in Sulthanpur. What this study discovered is that in sulthanpur, farmer debt and distress can be traced to two phenomena – a crisis of productivity and a crisis of profitability – which are connected by issues of water scarcity and irrigation investment and framed by issues of globalization and changing agricultural systems

While this is a geographically focused study, it also includes secondary research and discussion of the larger policy framework as it attempts to trace the impacts of agricultural and development policy in the state on the lives of farmers and farming families. While borewell irrigation and debt might be immediate causes of agrarian distress, they are rooted in a larger context of the globalization of agriculture and changing agricultural systems across India's rural landscape, making a preliminary discussion of agricultural policy vital to understanding the situation in Sulthanpur.

A. Scope and Methodology:

Discussing agrarian crisis, Narasimha Reddy and Srijit Mishra maintain that "methodologically, analysis of the impact of structural and institutional changes requires household and village level studies with particular attention to the processes of change."[7] In this same vein, this study was tightly focused geographically so that it could provide a more holistic

[7] Narasimha Reddy and Srijit Mishra, *Agrarian Crisis in India* (New Delhi: Oxford University Press, 2009): xx.

analysis of changing livelihoods and the structural nature of farmer debt without introducing too many location dependent variables. Similarly, household level analysis was seen as the building blocks for a larger village level analysis as distress and debt is experienced and mediated by the entire family unit. As a result, efforts were made to speak with multiple members of the households interviewed in Sulthanpur.

With the guidance of a local nongovernmental organization, Watershed Activities and Services Network (WASSAN), Sulthanpur village, located in the Ranga Reddy district of Andhra Pradesh, was chosen as the location for this study. Outside of the farmer suicide hotspots in Andhra Pradesh, no studies have analyzed the village debt burden in Sulthanpur. Comprised of 343 households, residents of Sulthanpur rely almost entirely upon agriculture and agricultural labor to generate income. Of the landholding residents, 93% are small and marginal – owning less than two hectares of land. A significant portion of the population lives below the poverty line as well as is illiterate. These factors make it both a challenging and vital place to conduct a study on agrarian distress: as Gandhian development philosophy maintains, if development is to be sustainable, it must begin with the poorest and most marginalized communities.[8]

In an effort to be true to this theoretical philosophy, this study involved a variety of methodological approaches, always aiming to hear the stories and perspectives of a number of community members. In total, forty structured and semistructured interviews were conducted with farming families. While these interviews attempted to quantitatively analyze factors like input use, debt burden, etc, they always ended with open conversation with farmers about their experiences with agrarian livelihoods and distress. These forty interviews were comprised of 35

[8] Dr. Prativha Jain, "An Alternative Model of Development: The Gandhian Perspective," SDSC Lecture, Rajasthan University, Jaipur, 2 April 2012.

borewell owning farmers, as irrigation was a main focus of this study, but also five interviews with farmers who did not own borewells as a point of comparison. Though not perfect accurate, the pool of respondents was selected to be representative of local demographics, paying particular attention to caste, landholding, annual income, and gender. Three farming families were also selected for more in depth case studies. Further, interviews with farmers were supplemented with interviews with borewell drilling companies and operators, a money lender/middleman and seed/chemical shop owner, and bank manager. Further, a group discussion was conducted with a women's village organization and direct observation methods were conducted at a local Gram Panchayat meeting. These methods were strategically chosen to provide a combination of qualitative and quantitative research, creating village level analysis and household level nuanced stories.

B. Defining Farmer, Defining Debt:

In studies, reports, and government documents about agrarian distress in India, particularly those related to farmer suicide, "farmer" is defined by the government, and subsequently by many scholars and journalists, as the individual in a family who owns the land title. In India, this is most frequently the male head of the household. [9] While the individual with the land title is certainly a farmer, he or she is not the only farmer. All members of the farming household, including women and other family members, contribute vast amounts of labor and wisdom to the farming process. This study attempted to integrate their voices into the interview process for a more holistic understanding of farming livelihoods. Thus, throughout this paper, the term "farmer" is gender neutral – it can refer to female or male respondents.

[9] Uma Sudhir, "Women Farmers Who Commit Suicide Ignored by the State," *NDTV* (Jan 2012).

It is also important to clarify farmer terminology. While this study was primarily focused on farmers who own borewells and grow groundwater irrigated crops in the dry season in addition to rainfed crops in the rainy season, as a point of comparison, it did interview some farmers who are purely rainfed and only grow crops during the rainy season. Despite the fact that both groups do practice rainfed agriculture, the difference is that borewell owning farmers do not only practice rainfed agriculture. This is an important distinction as the opportunity to grow two crops a year incentivizes farmer investment in borewell irrigation. While this terminology is far from perfect, in this paper these two groups will be referred to as "borewell owning farmers" and "rainfed farmers."

As important as it is to define "farmer," it is equally important to define and contextualize the concept of debt. Debt is not inherently corrosive to livelihoods. Farmers in Andhra Pradesh have been borrowing and repaying loans from banks and money lenders for many decades. However, in the past decade, due to rising inputs and rising expenditures, debt has become persistent, outstanding, and subsequently more severe for many farmers[10]. It is the persistent and outstanding debt that this study was interested in analyzing. Thus, when this paper discusses debt burden, it is concerned with debt that is both quantitatively large and takes years to repay.

IV. Structural Framework: Neoliberal Economics and the Changing the Purpose of Agriculture

In order to understand the significance of agrarian crisis and irrigation in rural Andhra Pradesh, it is important to consider the impacts of globalization and trade liberalization on Indian agricultural throughout the 1990s as much agrarian change is rooted in these processes. Liberalized agricultural policy is an important framework for both crises of productivity and

[10] Narasima Reddy and Srijit Mishra, *Agrarian Crisis in India* (New Delhi: Oxford University Press, 2009), 164-198.

profitability. Economic liberalization has not only allowed for the free import and export of commodities, but it has also allowed for the export and import of entire systems of production – in particular, the export of capital intensive, input intensive, and market oriented linear systems of output from developed countries and to developing countries.

Pre economic liberalization in 1991 and agricultural trade liberalization in 1997, agricultural in India was largely subsistence based. Despite technological changes that occurred during the late 1960s and 1970s, such as state investments in public irrigation and the introduction of fertilizers – the production and consumption of food across rural spaces was primarily localized. Though portions of the country were beginning to produce food at higher output levels and on larger scales, a majority of small and marginal farmers still largely practiced a more subsistence based form of agriculture.[11]

Further, even in states where production was being scaled up during the late 1960s and 1970s, food production was still largely domestic as the Indian government, under Indira Gandhi, pursued national food self sufficiency. In order to achieve this goal, the government established a number of trade restrictions on crops. For example, in the case of rice, export and import ceilings and tariffs were established to encourage domestic production and consumption. Further, according to trade policy, rice had a minimum export price, also called a minimum support price, which amounted to 150% the cost of production. For those farmers who were producing for the market, these policies provided some institutionalized economic security.

1992 through 1997 witnessed the dismantling of many of these policies. When India opened its economy in 1991, trade restrictions were somewhat relaxed, though not fully. After India became a WTO signatory in 1995, the WTO mandated the full liberalization of agricultural

[11] Narasimha Reddyand Srijit Mishra, *Agrarian Crisis in India* (New Delhi: Oxford University Press, 2009).

trade. In 1996, India shattered its previous quota by exporting 2 million tons of rice, and in 1997, the government abolished minimum export prices, volume based restrictions on imports and exports, and tariffs were greatly reduced. This policy reform represented a "shift in institutional emphasis from state to market" as regulated economic policies were replaced with a strict neoliberal philosophy. [12]

This shift in policy signifies a changing purpose for agriculture – instead of growing food to feed people, the purpose became to grow crops to generate cash. As the market came to dominate agroeconomic relationships, and rupees replaced calories as the primary measurement of production, agriculture began to show up in measurements of Andhra Pradesh and India's GDNP. Whereas food self sufficiency was of primary importance to the Indian government before 1991 – in the 1980s, India produced enough food for both domestic consumption and some export – economic growth became the goal of post-liberalization agricultural policy.[13]

Further, these policies have also dramatically reoriented and restructured methods of production throughout India. This phenomenon is particularly visible in Sulthanpur. In general, localized food production has been replaced with market oriented food production, and cash became an intermediary in farming families between production and consumption. Although some farmers in Sulthanpur grow a little paddy for their families, most sell their crops and purchase their food entirely in the market. This is both the result and cause of the rising importance of cash crop agriculture and to reduction of crop diversity in the past fifteen years

To be more specific, it was precisely in 1997 that farmers in Sulthanpur reported beginning to change their crop choices. In general, the trend among farmers was to simplify.

[12] B.N. Ghosh, "Globalization and Food Policy Dilemmas in Developing Countries: Contextualizing the Indian Scenario," *Journal of Third World Studies*, v. 26 (2009): 107.

[13] Yogendra K. Malik and Dhirendra K Vajpeyi, *India: The years of Indira Gandhi* (Netherlands: E.J. Brill), 1-4.

From the sample of borewell owning and rainfed farmers, 65% reported reducing the number of crops they grew and replacing many food items with cash crops. Previously, these farmers tended to grow a diversity of vegetables, grains, paddies, and millets for family consumption and local distribution. However, in the past fifteen years, crops like maize, paddy, cotton, and groundnut have come to dominate the landscape. Farmers sell these crops in the market to earn an income. They are also entirely dependent on the market for their day to day eating habits. Thus, changing national agricultural priorities have been imposed upon, and embedded in, the rural landscape. As the market has become the intended recipient of crops and the economy the intended beneficiary of production, food and human consumption are subordinated in India and Sulthanpur.

V. Structural Framework: Changing Agricultural Systems

Just as the purpose of agriculture has changed since 1997, so have methods of production. For example, in Sulthanpur, hybrid seeds have entirely replaced traditional, local varieties and chemical fertilizers have largely replaced natural compost. As a result, agriculture systems have become input intensive, linear, and market dependent. Post 1997, agricultural and chemical multinational corporations were given access to local markets and rural areas and landscapes were flooded with new varieties of hybrid seeds, agro chemicals, and technologies.

While these technologies had certainly been present in Indian agricultural before 1997, having been introduced by the Green Revolution in the late 1960s, they suddenly proliferated and became widely available, even to the most marginal of farmers. Brands like Monsanto and Syngenta began showing up in little villages across the country – importing new systems of production and restructuring agroecologies. In essence, laboratory agriculture became the new

ecological logic. Therefore, since the liberalization of agricultural trade in 1997, systems of food production have transformed. Not only did the emphasis of agriculture change – from growing food to growing crops for the market, inputs also changed. Hybrid seeds replaced traditional, local varieties and chemical fertilizers largely replaced natural compost. In general, production became input intensive, linear, and market dependent.

This phenomenon is evident in Sulthanpur. All the farmers interviewed identified 1997 as the year when agricultural systems began to change in the village. Of the farmers surveyed, 100% reported switching from local seed varieties and seed saving practices to using hybrid seeds and purchasing them in the market every season in the past fifteen years. 1997 also marks the years that the purchase and use of agrochemicals become widespread throughout the village. Suddenly, products from companies like Syngenta, BASF, and other multinational corporations began appearing in local shops and replacing older forms of soil enrichment, like natural compost.

These systematic transformations have not been unintentional or entirely organic. In the past 15 years, local shops have relentlessly advertized hybrid seeds, fertilizers, and pesticides as miracle inputs that increasing fertility, productivity, and crop resilience. As one seed and fertilizer shop owner stated: "If farmers are cheap, their livelihoods will suffer. If they choose instead to buy the expensive, quality products, their livelihoods will improve."[14] A farmer affirmed this message when he stated: "If you but more expensive seeds, you will get higher yields." He also commented that advertizing played an important role in his initial shift to hybrid

[14] Satya Reddy, Money Lender, Personal Interview, Sulthanpur, AP, 25 April 2012.

seeds as he was promised higher productivity and profit.[15] He wasn't alone in this transition. Multiple farmers reported originally choosing to purchase hybrid seeds and agrochemicals because of such advertizing, and even more farmers reported being influenced by other farmers who had made the decision to switch.

Though in a more subtle manner, the government of Andhra Pradesh also actively promotes hybrid seeds and agrochemicals through a policy of subsidies – up to 25% off the market price. A number of other farmers reported initially switching to these technologies because they were promised higher yield and increased profit by the government.[16] One farmer stated that he trusts the products that the government supports. However, he also reported that when he bought hybrid seeds, the government didn't inform him that he wouldn't be able to save them year after year. He was forced to purchase again the subsequent season when the seeds did not germinate, and since then, he has had to purchase hybrid seeds from the government or shops every season. [17]

Though this new system initially improved yields in Sulthanpur, throughout the past fifteen years it has also contributed to the crisis of productivity mentioned previously. As reported by farmers in Sulthanpur, originally, in the first year of implementation, hybrid seeds and chemical inputs increased farmer yields. As a 90% of farmers in Sulthanpur are small and marginal, those interviewed felt that if they were going to sell their crops in the market, it was important to maximize yield on their small landholdings. However, for those farmers who implemented hybrid and chemical technologies earlier, between 15-10 years ago, many have

[15] Uppu Sajid Jahihi, Farmer, Personal Interview, Sulthanpur, AP, 21 April 2012.
[16] Narasimulu, Chakali, Farmer, Personal Interview, Sulthanpur, AP, 22 April 2012.
[17] Sriniwas, Eddigi, Farmer, Personal Interview, Sulthanpur, AP, 17 April 2012.

found it difficult to maintain the same levels of productivity since those initial spikes. Farmers have had to continuously increase their inputs year after year to achieve the same results. In Sulthanpur, farmers reported increasing their chemical usage by 200% - 600% in an attempt to stabilize yields.

It is important to note that many farmers reported to declining soil fertility as an important contributor to these declining yields. As Narasimha Rao and K. C. Suri state in their article, "Dimensions of Agrarian Distress in Andhra Pradesh,"

> "High use of pesticides and chemical fertilizers year after year has had a deleterious effect on the productivity of the soil and environment.[18] One farmer confirmed this when he said that his fields have "become adjusted to fertilizer," and so he has to increase his quantity of input annually in order to stabilize falling yields."[19]

Other scholars argue that while the trend of continuously increasing inputs is the result of changing soil fertility, it is also partly psychological. As B.N. Ghosh argued in her article "Globalization and Food Policy Dilemmas in Developing Countries: Contextualizing the Indian Scenario",

> "Farmers are led by the traders of seeds, pesticides and fertilizers, who of late have become the main source of knowledge and information to the farmers on cultivation practices, to believe that they need to use more of these inputs to reap a better harvest."

[18] Rao, Narasimha and K.C. Suri, "Dimensions of Agrarian Distress in Andhra Pradesh," *Economic and Political Weekly* 41 (2006): 1546-1552.
[19] Byagari Mallamma, Farmer, Personal Interview, Sulthanpur, AP, 22 April 2012.

Farmers in Sulthanpur confirmed this sentiment when they stated they believed that the more fertilizer they use, the better their harvest will be. The solution to declining yields is simply more chemicals.

To compound matters, in the past fifteen years many farmers surveyed mentioned that they have had to sell off their livestock to repay debt. This phenomenon further pushed farmers toward agrochemicals and solidified the transition to input intensive production systems.[20] While many believed that compost was both better for the soil and their crops, their lack of access to livestock prevented them from returning to compost fertilizer. In general, there is minimal compost usage in Sulthanpur, and the farmers who do use compost tend to be large, wealthier farmers who have not had to liquidate their assets and sell their livestock.

Despite numerous accounts of runaway chemical use and declining yields, few policy makers and private market players seem to be questioning the appropriateness of these technologies on farmers and their livelihoods. However, the stories from farmers in Sulthanpur reporting the need to increase their chemical usage yearly in order to compensate for declining soil fertility and yield certainly challenges the wisdom of conventional, input intensive systems of production. As individuals who have a wealth of agricultural wisdom built up over generations, farmers' knowledge of local agroecology is both intimate and holistic. Policy makers and scientists would do well to incorporate farmer's wisdom into their agricultural developments.

VI. Water: The Annual Wildcard

[20] Satya Reddy, Money Lender, Personal Interview, Sulthanpur, AP, 25 April 2012.

While relationships between chemical use, soil fertility, and yield are certainly linked, the key variable, or wildcard, in the productivity equation is water. Andhra Pradesh is a semi-arid state where 57.7% of agricultural land is irrigated with rainwater. However, monsoon patterns have begun to change, placing purely rainfed farmers in a precarious position. Of the farmers interviewed, all mentioned a shortage of rainfall in recent years. According to two farmers, while some years are better than others for rainfall, in their memory, no year has reached average rainfall in the past decade.[21] According to another farmer, during the four month rainy season, they currently get as much rainfall as they used to get in two months a decade ago. [22] However, the problem isn't simply about quantity – it is also about timing and regularity. According to one farmer, the monsoons are starting later and later each year, and the duration of time between rainfall events is increasing. [23] Further, climactic extremes are impacting crop productivity – particularly in the past three years. All farmers interviewed reported flooding and crop failure in 2010, and then severe drought and crop failure in 2011.

Increasing inputs and decreasing rainfall security have led to a crisis of productivity throughout AP, but particularly in Sulthanpur. Some farmers reported yields declining by as much as 50 - 70% in the past ten to fifteen years,[24] while others reported years of total crop failure.[25] While there are a few farmers whose experiences differ, this is the reality that a majority of farmers are experiencing. The impacts of declining yields and productivity are felt most acutely by small and marginal farmers who have minimal land under cultivation to begin with.

[21]Ramulu, Karukonda, Farmer, Personal Interview, Sulthanpur, AP, 19 April 2012.
[22] Boda Hanumaiah, Farmer, Personal Interview, Sulthanpur, AP, 25 April 2012.
[23] Narahari, Farmer, Personal Interview, Sulthanpur, AP, 22 April 2012.
[24] Pandya Nayak, Farmer, Personal Interview, Sulthanpur, AP, 28 April 2012.
[25] Chakali Narasimulu, Farmer, Personal Interview, Sulthanpur, AP, 22 April 2012.

Declining yields and uncertain rainfall patterns are pushing farmers toward other methods of irritation. In Andhra Pradesh, in the past decade, the percentage of rain and canal fed land has decreased by 5% annually, while the percentage of groundwater irrigated land has similarly increased.[26] In Sulthanpur, where there are no public irrigation facilities or surface water sources, this phenomenon is even more dramatic: wherein 85% of borewells have been drilled in the past decade, and 96% have been drilled in the past two decades. This timeline maps clearly onto farmer's reports of rainfall change, and as many farmers reported themselves, there is a direct correlation between inadequate rainfall, declining yields, and investment in borewells. As the owner of one local borewell drilling company stated: "Water scarcity drives farmers to my company. As long as rain is a problem, I will have business."[27]

VII. Case Study 1

That statement was certainly true for Bayya Venkataiah and his wife Bayya Ashamella, who, after severe drought in 2011, decided to drill a borewell in hopes of buffering their income against rainfall and climate variations. While soil fertility and yield had been declining for a number of years, and Venkataiah and Ashamella had been forced to constantly increase fertilizer use on their fields in an attempt to stabilize production, their yield declined dramatically after severe and untimely monsoons flooded their fields in 2010, and drought struck in 2011, both of which nearly destroyed their yields two years in a row. In the wake of those experiences, Venkataiah and Ashamella decided to invest in a borewell in 2011.

[26] "Agricultural Statistics at a Glance: Andhra Pradesh," *Department of Agriculture* (2010) http://www.apdes.ap.gov.in/publications/Outline%202009-2010.pdf.
[27] Sri Vieshneavi Borewells, Owner, Personal Interview, Sulthanpur, AP, 26 April 2012.

Like some other small and marginal farmers in Sulthanpur, Venakataiah and Ashamella did not have access to bank credit – given the state bank of Hyderabad's policy of "preferential treatment for older customers," as stated by the local branch's bank manager, they had always relied upon money lenders and informal sources to finance their annual crop loan for agrochemicals and seeds. [28] When it came time to drill a borewell, they felt they had no choice to take another loan from their money lender. In Sulthanpur, the interest rate on loans from money lenders ranges from anywhere between 3-6 times the average bank loan interest rate. In the case of Venkataiah and Ashamella, the interest rate on their borewell was 3% per month, or, 36% per year.

Given the high interst rate and the fact that the price of a borewell is determined by its depth – the groundwater table in Sulthanpur last year hovered near 500 ft – the borewell became a very significant financial investment for the family, especially given its interest rate. While the principle totaled over two times their annual income, after accumulating six months of interest, the loan amounted to two and a half times their annual income. When added to previously unpaid crop loans, the couple is facing a total debt burden that is nearly seven times their annual income.

In the past six months, the water in the borewell has declined by 50%. This season Venkataiah and Anjamma didn't even have enough water to irrigate a whole acre of paddy. After the third year in a row of poor yields, they have little income to spare. After they pay what little they can on their loans, there is no money left over for household expenditures, like their electricity bill and food. The couple recently had to take out another loan just to cover these basic needs.

[28] Sagar, B., State Bank of Hyderabad Parigi Branch Manager, Personal Interview, Sulthanpur, AP, 22 April 2012.

To compound matters, in exchange for the loan, after harvest Venkataiah and Anjamma are required to sell their crop back to the money lender, who serves as a middleman between them and the market. On average, middle men offer lower prices for crops as well as exact interest for seeds, fertilizers, and other inputs that they loaned out at the beginning of the season. Profit is further depressed for the couple who badly needs

When asked what the couple was planning to do next season, they said that they didn't know – it depended upon the water. Assuming that they would be able to get another loan to cover the upfront costs of production, they hoped that favorable rains and a steady groundwater table would allow them to have a higher and more profitable harvest. Their hopes were modest – to be able to cover their household needs with their own income and pay off a little debt.

VIII. Connecting Productivity and Profitability: Groundwater Concerns

As seen in the story of Venkataiah and Ashamella, a crisis in productivity can quickly become a crisis in profitability. Though the search for water serves as a bridge between the two, there are a number of factors – natural, and constructed – that influence how well farmers are able to do each year. In the case of Sulthanpur, investments in borewells along with dramatically declining groundwater tables and high expenditures in the form of irrigation, electricity, chemicals, and seeds force capital intensive farming upon a farming class that is predominantly small, marginal, and poor. Further, this economic burden is compounded by the strong presence of informal finance in Sulthanpur and surrounding areas, which, in functioning as money lender on the production end of the system and middle man on the market end of the system, charge higher prices and higher interest rates for inputs and loans as well as provide lower market rates for crops. Therefore, while investment in borewells is central to the profitability crisis for many

farmers, there are a wide variety of factors need to be analyzed in turn in order to understand the complex web of finance, technology, and nature that farmers must negotiate on a regular basis.

While many farmers see groundwater as a more secure source of irrigation than rainwater and subsequently look to borewell technology to compensate for their climatic vulnerability, groundwater irrigation is quickly proving itself to be uncertain and unsustainable. In Andhra Pradesh, 43.3% of agricultural land is irrigated with groundwater. This figure has increased roughly by 5% every year in the past decade while the percentage of rain and canal fed farmland has similarly decreased.[29] Further, throughout the state groundwater table is as low as 300-400 ft, and in some areas even dips to 1000ft. The mining of groundwater to these levels has contributed to the drying up of ponds, rivers, streams, and other surface water sources. [30] While the drying of surface water has important implications for irrigation, it also affects larger issues of livelihood. According to one farmer in Sulthanpur, the drying of a local pond has eliminated a main source of drinking water for local cattle. Some cattle have died, others have been sold, and farmers have had to find new drinking water sources for the rest.[31] Some farmers have been forced to divert water from their borewells for their cattle. [32]

In accordance with trends throughout the state, groundwater levels in Sulthanpur have decreased dramatically in the past ten years. According to two separate borewell operators, 10 years ago they would first strike water at 60ft, and by drilling to 100ft would find plenty of water for the farmer. This year, operators reported drilling 530 ft. deep before they struck water, and

[29]"Agricultural Statistics at a Glance: Andhra Pradesh," *Department of Agriculture* (2010) http://www.apdes.ap.gov.in/publications/Outline%202009-2010.pdf.
[30]P Sainath, "Sinking Borewells, Rising Debt," *India Together* (June 2004).
[31] Jangamma, Chakali, Farmer, Personal Interview, Sulthanpur, AP, 21 April 2012.
[32]Kammari Venkataiah, Farmer, Personal Interview, Sulthanpur, AP, 20 April 2012.

borewell depth is ranging from 600-700 ft deep in total.[33] This represents a nearly 900% decrease in the groundwater level. Further, statistically, drilling companies are finding that for every five borewells they drill, only one strikes water. The other four fail completely, signifying that the groundwater table in some areas is even lower than 700ft.

In interviews, farmers affirmed this phenomenon. All but one farmer reported water tables declining between 50-80% (depending upon the borewells age and depth). Eight farmers reported their borewells failing entirely and being forced to return to purely rainfed agriculture. Additionally, a number of farmers reported successive borewell failures. Last year, driven by declining yields and insecure water supply, one farmer drilled five borewells on his land in one month, all of which failed. For each borewell that turned out to be dry, he became more desperate to drill a successful borewell in order to hopefully boost his yield and recover some of his investment. Previously, his family had minimal debt, but after drilling five unsuccessful borewells, he was left with a debt of Rs. 120,000 with a 36% annual interest rate.[34] This wasn't even the extreme -- another farmer reported drilling fifteen borewells with his brother in the span of twelve years– all ended up failing from the beginning or drying within a year or two.[35]

Contributing to the high rate of borewell failure is the lack of strict regulation of drilling. Though the government of Andhra Pradesh implemented the Water, Land, and Trees Act in 2004, which required borewells funded by state banks to be certified by a geologist before drilling, this act has done little to slow the rate of groundwater mining. According to Rule 12 of this act, "The Mandal Authority shall have to ensure that every owner of the well in his

[33] Krishnaiah, Borewell Operator, Personal Interview, Sulthanput, AP, 24 April 2012.
Sri Vieshneavi Borewells, Owner, Personal Interview, Sulthanpur, AP, 26 April 2012.
[34] Antaiah, Sankalla, Farmer, Personal Interview, Sulthanpur, AP, 23 April 2012.
[35] Nayak, Pandya, Farmer, Personal Interview, Sulthanpur, AP, 28 April 2012.

jurisdiction, registers his well with the Mandal Authority, and obtains permission for new wells on payment of fee."[36] However, this process only applies to borewells which are funded by state banks, and involves a complex weighing of short term expenses and long term benefits.

If a farmer obtains a bank loan for a borewell – which was a rare occurance in Sulthanpur due to a number of bureaucratic and procedural policies – a governmental geologist then surveys the farmer's land. If the geologist inadequate groundwater, he advises the farmer not to drill. If he finds adequate water, he approves the borewell and registers it with the Mandal. Further, according to the act, if the geologist approves drilling and the borewell fails, the farmer can be compensated for his investment by the government.

While this policy provides a safety net for those with access to bank credit, it also levies the cost of the certification upon the farmer – typically Rs 2,000 – which is in addition to, and cannot be covered by, the bank loan. This additional expense is generally too expensive for most farmers and prevents them from seeking certification. According to the owner of a local borewell drilling company, only 5% of farmers – the wealthiest 5% of farmers – obtain certification for their borewell and drill according to the Water, Land, and Trees Act. The other 95% are forced to rely upon money lenders and informal finance as their primary source of credit. These informally financed borewells are termed "private" and outside of the jurisdiction of this act. The farmer does not have to get his or her land surveyed by a geologist or register his or her borewell certified. Similarly, companies do not need to register the borewell or their drilling with the government.

[36] "Andhra Pradesh Water, Land, and Trees Act of 2002," Andhra Pradesh State Government, International Environmental Law Research Institute, http://www.ielrc.org.

This policy framework leaves groundwater largely unregulated and opens up aquifers to mining. The fact that groundwater tables have decreased by over 900% in ten years is a glaring indicator that extraction is occurring at a significantly higher rate than recharge. Thus, borewell irrigation, in this context, has proven itself as unsustainable. Even the owner of a borewell drilling company acknowledged this fact. He stated that though he thinks business in Sulthanpur and surrounding areas will continue for the next five years, he doesn't see drilling as particularly profitable in this region and is hoping to relocate his business in South Africa after that.[37]

A. Borewells and Farmer Debt

Investments in borewell irrigation accompanied by falling groundwater levels and failing borewells have greatly impacted farmer debt and livelihood – particularly for small, marginal, and poor farmers. While the principle amount for a single borewell used to not be particularly outstanding, current rates have skyrocketed as depths have plummeted. Further, the issue for many farmers is not that the size of the loan necessarily, but rather the addition of any loan to their already tight income. With the exception of a few wealthy, large landholding farmers, all borewell farmers reported that though borewells might have initially improved their yields, over a number of years yields decreased, income decreased, and debt increased as yields were not compensating for the initial investment. Though farmers began taking loans out when they adopted hybrid seeds and agrochemicals, they reported "feeling indebted," or feeling like they had a significant debt burden, the year they drilled their borewell. As one farmer stated, "Borewells have not just increased debt, they have created debt. People without borewells don't have debt."

[37] Krishnaiah, Borewell Operator, Personal Interview, Sulthanput, AP, 24 April 2012.
Sri Vieshneavi Borewells, Owner, Personal Interview, Sulthanpur, AP, 26 April 2012.

While this statement is not entirely factual – purely rainfed farmers also frequently take out crop loans for seeds and chemicals – the sentiment behind it is powerful. In comparison to purely rainfed farmers, borewell owners have a significantly more difficult time repaying their loans on time. Of the sample of purely rainfed farmers that were interviewed, all farmers reported borrowing, but they all also reported being able to repay their loans annually or every other year (with the exception of the past two years because of extreme weather conditions).[38] Borewell owners, on the other hand, reported longer repayment schedules. Some stated that the additional borewell loan made it difficult to repay their annual crop loan – which is necessary for continued production, others stated that it took them between five-10 years to repay their borewell loan, while others reported either not fully paying it off or paying none of it off. This longer timetable for repayment is significant in that it contributes to the phenomenon that it proves. While extended repayment is evidence that borewell loans are creating economic burdens for farmers, it also contributes to the problem in that with loans, time is equivalent to accumulating interest. As a majority of borewell loans are taken from money lenders who charge interest rates of 24% - 72% annually in Sulthanpur, a ten year repayment process can accumulate immense amounts of interest, which further exacerbate farmers inability to pay. As a result of this process, one farmer reported debt increasing by 600% since drilling their borewell.[39]

In summary, the relationship between groundwater irrigation and farmer debt is a multifaceted issue in which technology, policy, markets, and nature all interact. As farmers have sought groundwater irrigation to buffer against changing rainfall patterns, they have also taken out large investments at high interest rates for a technology that is, in this context, risky and

[39] Narasimulu, Kurva, Farmer, Personal Interview, Sulthanpur, AP, 21 April 2012.

unsustainable. Further, as farmers in masse participate in this process, groundwater is being mined in the area and groundwater tables are declining dramatically, making the benefits of the investment obscelete to local farmers. Therefore, borewell irrigation is playing a central role in the dual crises occurring in Sulthanpur as it bridges issues of productivity with issues of profitability. The story of borewell irrigation also hints at other components of the crisis of profitability – primarily the role of the informal market and informal finance in agricultural production and irrigation.

One farmer, Chakali Anjaiah, whose borewell failed this year, repeatedly stated during her interview that this borewell failure had put her family under severe distress. For a family who lives season to season, the loss of a harvest can be detrimental to their income. Having taken out a crop loan for seeds and chemicals for the summer season, and then not been able to irrigate or cultivate, they face a compounded debt and no source of income. In preparation for the end of the season when she is expected to start paying loans, she disconnected her family's electricity and began rationing their food.[40] Once again, this story is not unique. As borewells have dried, particularly in the last few years, the area in Sulthanpur under groundwater irrigation has shrunk and many farmers reported having to leave acres fallow during the summer season.

IX. Compounding Factors: Informal Finance

Money lenders and middle men – frequently one in the same, play an important role in determining profitability at the end of the season. As mentioned previously, farmers in Sulthanpur borrow annually for the seeds, chemicals, and other inputs required for production. While many depend upon informal finance, most would prefer to borrow from the bank because

[40] Chakali Jangamma, Farmer, Personal Interview, Sulthanpur, AP, 21 April 2012.

of lower interest rates. However, a significant number of famrers do not have access to bank credit, forcing them to turn to informal sources of finance – primarily money lenders. From the sample of farmers in Sulthanpur, farmers without access to bank credit tend to be predominantly small, marginal, and poor, but are prevented from accessing bank credit due to a number of bureaucratic and logistical factors.

Access to bank credit is both a matter of policy and sheer numbers. If a farmer has a preexisting relationship with the bank, in the case of Sulthanpur, the State Bank of Hyderabad, than they are able to annually utilize formal financial institutions to secure their crop loans. However, the percentage of farmers with preexisting credit is signifianctly smaller than the number of farmers seeking credit. As, banks in rural areas are organized regionally, and farmers must take a crop loan from a bank that serves their region, the period of time right before cropping season can be entirely hectic. As the bank manager for SBH stated – it is impossible for banks to serve all farmers in a locality because of their lack of personnel and resources. As he described, fifteen days before the start of the season, somewhere between 2,000 – 3,000 farmers from a number of villages descend upon the bank seeking loans. The single field officer whose job it is to approve the loans cannot possible process serve all these people. Therefore, the bank has adopted a policy of preferential treatment for preexisting customers. The privileged farmers with bank credit are continuously served while those without access are never able to make the transition between informal and formal finance.

This proves problematic as informal finance tends to control multiple aspects of production and profit – the job of seed and agrochemical seller overlaps with that of money lender and mediator, in charge of loaning money, exacting interest, and serving as an intermediary between the farmer and the market. For example, at the beginning of a season, a

farmer, with no cash to spare, takes seeds and chemicals on loan from a local shop. In exchange for loaning out bulk products, the shop then imposes an interest rate – anywhere between 3-6 times that of the bank interest rate – and requires the farmer to sell their crops back to him after harvest to ensure repayment. The interest is then exacted, and farmers are paid for their crops. However, according to the majority of farmers who are subjected to this cycle, not only does interest affect their profit, money lenders tend to buy at prices that are lower than those in the market. A number of farmers reported that money lenders are purchasing crops at half the market rate, and then turning around and selling them for twice the profit the farmer made. Farmers had strong opinions about this process. As one farmer stated, "Money lenders make twice the money in one day that a farmer makes throughout an entire season."[41] Responding to the work and profit discrepancies between money lenders and farmers, another individual commented that "the poor will be poor and the rich will be rich in agriculture."[42] And still another stated, "The farmer is the backbone of the country. If the market rate was fair, the farmer would live a luxurious life."[43]

While this situation is far from fair, a majority of small and marginal farmers in Sulthanpur have no choice but to participate as they don't have the upfront cash to pay directly for inputs at the beginning of the season. Further, this dependence upon money lenders is likely exacerbated in Sulthanpur. In India, 48% of farmers purchase seeds, in AP, 81% purchase seeds, but of the farmers surveyed in Sulthanpur, 100% purchased seeds. Of these farmers, only three stated that bank credit allowed them to avoid borrowing inputs from local shops. The rest reported a dependence upon local shops for their inputs. According to the owner of one such

[41] Golla Manemma, Farmer, Personal Interview, Sulthanpur, AP, 20 April 2012.
[42] Sriniwas, Eddigi, Farmer, Personal Interview, Sulthanpur, AP, 17 April 2012.
[43] Anjilaiah, Ippalapalli, Farmer, Personal Interview, Sulthanpur, AP, 20 April 2012.

shop, 99% of farmers who borrow from him do not have the cash to pay upfront. Agreeing to sell their crops back to the shop at the end of the season, they instead take their inputs on loan.

Further, seed and fertilizer prices have risen dramatically throughout India, including in local Sulthanpur markets. As XXXX describes, "Fertilizer subsidy [in India] has been considerably reduced. Fertilizer subsidy, which amounted to 3.2 percent of GDP and 6 percent of the Union revenue expenditure in 1990-91, was reduced to to 2.5 percent and 5 percent by 1997-98. It was further reduced to .69 percent of GDP by 2003-2004." Farmers in sulthanpur have intimately felt the economic impacts of the withdrawal of state support. While nearly all farmers reported increasing seed and fertilizer prices in the past fifteen years, one farmer quantified these increases. He stated that in the past ten years, the price of seeds has increased by 30%, the price of Urea has also increased by 30%, and the price of DAP has increased by 100%. [44] These rising expenditures further exacerbate the crisis of profitability as they squeeze farmers' incomes and force them to take out larger loans to cover the upfront costs of expenditures and frequently increase their dependence upon money lenders and informal sources of finance.

A. Case Study 2

While a majority of surveyed farmers were engaged in this cycle of increasing expenditures and reliance upon money lenders, and middle men, the impacts of this dynamic in the village can be best expressed through the story of one farmer who acutely experienced the consequences of reliance upon informal finance.

Karukonda Ramulu is a farmer with a long legacy in Sulthanpur. His ancestors have farmed in the village for many generations, "forever," as he stated, growing rainfed jowar,

[44] Goddembavi Eeshwaraiah, Farmer, Personal Interview, Sulthanpur, AP, 18 April 2012.

vegetables, and other cereals. However when he and five other farmers received a government grant to drill a collective borewell twenty years ago as a part of a public initiative to support impoverished, scheduled caste farmers, he simplified his crop choice to rainfed jowar and irrigated paddy. Eventually, as the communal borewell began to dry and farmers began to fight over water usage, Ramulu decided to invest in a personal borewell. Having never had access to bank credit, Ramulu took out a loan from the same shop that he borrowed his seeds and chemicals from annually. The money lender established an interest rate of 3% per month, and told Ramulu the total was due six months after the start of cultivation.

While the water in the borewell was low to begin with, it only took six months for it to dry up completely. Therefore, after one season of paddy cultivation, Ramulu was forced to leave his lands fallow during the summer season and rely entirely upon rainfed jowar. However, Ramulu is required to sell back his jowar to the same money lender, who after exacting interest, pays Ramulu a price that is 40% of the market rate. Desperate for income, he has no choice but to accept.

Further, the money lender is not happy that Ramulu has still not paid off his borewell loan, and is threatening to not loan seeds and chemicals to him next season if he doesn't pay immediately. Lacking the cash to repay the loan, Ramulu feels that he is potentially facing a year of no harvest. He would seek out another money lender, but this money lender's pressurizing tactics prevent him from doing so. Ramulu stated that he feels sorrow and worry when he thinks about the future, and does not know what he is going to do to either pay back the borewell loan or borrow the seeds and chemicals he needs for cultivation.

The term Ramulu uses to describe the money lender is *Shavkar*, which among locals means "feudal lord." As the money lender controls all aspects of Ramulu's production – inputs and outputs, prices and profit – his terminology is not inappropriate. Though not all farmers in Sulthanpur are facing the same situation, many are engaged in similar systems of agriculture. Therefore, just as the crisis of productivity in sulthanpur is the result of input intensive chemical farming and its high water demands, so too is the crisis of profitability constructed according to hierarchies or power and class.

X. Further Manifestations: The Extent of Distress

As outlined above, increasing expenditures, decreasing profitability, a reliance upon informal finance, and the presence of persistent and outstanding debt have put a significant strain on farmers' livelihoods and day to day existence. With the exception of wealthy and large landholding farmers, all reported feeling that it was very difficult for them to repay their loans. Further, all but one farmer reported that agriculture had become significantly less profitable during their lifetime. These factors have manifested themselves in farmer's lives and the local economy in a number of ways. Out of the farmers surveyed, which were diversified according to caste, income, age, gender, and landholding, all but two reported either not being able to pay back their loans on time or not repay them at all. This phenomenon generally began the year they drilled the borewell – previously, many commented that they were able to repay their loans annually or according to the predetermined repayment schedule. Similarly, of the rainfed farmers who were interviewed, all reported being able to repay more regularly than a majority of borewell owning farmers.

Further, this extra debt burden affected the rest of the household economy for borewell owning farmers. A number of farmers reported that after they paid a little bit on their loans

every month, they hardly had enough money to cover their household expenses, like food and electricity. Some had discontinued their electricity connection and begun to ration food for their family – eating two meals a day instead of three. Similarly, other farmers reported having to take out loans to cover their household expenses. One farmer stated that though the loan temporarily covered their daily expenditures, she wasn't sure how she would be able to repay the loan or put food on the table once the loan had run out.

Some farmers compensated for this dilemma by borrowing to repay loans. Taking a loan from one money lender, they would borrow another from a different money lender to repay the first. Then, they would take out another from the first to repay the second. While this method served to relieve pressure that families felt from money lenders, they also stated that it put them in a precarious position economically as the interest accumulated and they were forced to borrow larger and larger loans each time.

These stories are not even the most extreme. While farmer suicide is rare in Sulthanpur, it is not unheard of. One farmer, who had been identified as a respondent for this study, took his life the night before his interview. This tragedy was felt throughout the village as the community was forced to face the grim reality of agrarian distress.

His story, as well as the stories of other farmers facing debt and distress, bridges the personal and political as it reveals the impacts of a joint system of unsustainable agriculture and unsustainable economics. While farmers are trying their best to earn a living in this complicated system, their livelihoods, particularly for the vast majority of farmers who are small, marginal, and poor, are severely impacted. With little state support and no voice in policy, the lives of the rural poor are sacrificed in the name of neoliberal economics and economic growth. Their stories are both a call for grassroots development policy and investment in rural areas. While

many farmers are certainly looking for more immediate forms of relief than those generated by policy, we must prioritize the rural poor as we generate development policy. However, as we look ahead to a future of continued globalization and neoliberal economics, this is not the case.

XI. Summary of Findings

As outlined above, the intensification of agriculture since the Green Revolution in Andhra Pradesh has placed small and marginal farmer livelihoods in an uncertain and vulnerable position. This linear version of agriculture, which relies upon significant inputs and financial investments to produce a single cash crop for the market, has created a cyclical burden for farmers where they are constantly borrowing and investing in more chemicals and deeper wells in order to compensate for declining yields. The liberalization of agricultural trade in 1997 has exacerbated this vulnerability as farmers are no longer able to fetch a high enough price in the market to repay their debt. Though the Green Revolution and economic liberalization were touted as development progress in the agricultural sector, the state is facing crises of productivity and profitability as a result of them.

XII. Looking Ahead: Policy Limitations

Though the state of Andhra Pradesh has attempted to compensate for agrarian crisis – mainly in the form of financial relief to families of farmer suicide – the root issue of a linear, market oriented production system that has been imposed upon inappropriate landscapes and populations – have not been addressed. This is partly due to the fact that Andhra Pradesh's long term development strategy does not look to small and marginal farmers to revive rural areas.

In "Vision 2020," Andhra Pradesh's twenty year development plan, the government points toward industrial agriculture as an engine for economic growth and rural employment. "Vision 2020" states: " Andhra Pradesh can capitalize on its agricultural advantages to further develop its agro-industries using raw materials such as cotton, sugar, tobacco, chillies, etc. Furthermore, agro-industry can create considerable economic impact through value addition, higher export earnings, and high employment, especially in rural areas."[45] Thus, while the government has certainly acknowledged small and marginal farmer crisis in the state, it is looking toward industry as a way to revive and develop the rural areas. Contract farming, where the state leases land to private companies who are responsible for all the stages of production, marketing, and export, is also being discussed and implemented in the state as a similar development strategy.

In this way, Vision 2020 sheds a complicated light on the agrarian crisis in Andhra Pradesh in that though agricultural crisis is acknowledged as a problem, it is simultaneously paving the way for the state's preferred form of future development. Farmer suicide, rural to urban migration, and debt are clearing rural areas of small and marginal farmers. Of the small and marginal farmers surveyed in Sulthanpur, all stated that they don't want their children or grandchildren to be farmers. Further, many are starting to pick up wage labor jobs to either supplement their income or help them transition out of agriculture. [46] As villages empty, farmer indebtedness is paving the way for the future consolidation of land under large farmers, agroindustry, and private companies. Therefore, industry, as well as the state whose economy is driven by industry, becomes an indirect beneficiary of agrarian crisis, farmer debt, and farmer suicide.

[45] "Andhra Pradesh: Vision 2020,"Government of Andhra Pradesh (1999) http://www.scribd.com/doc/33166412/Andhra-Pradesh-Vision-2020-full-document.
[46] Tara Lohan interview with Vandana Shiva "Corporate Agriculture is to Blame" *Alternet Environment* (2009).

XIII. Alternative ways forward: Democratizing Technology and Food Production

This pro growth and pro industry plan raises the question of what will happen to villages like Sulthanpur if alternative forms of rural revival and sustainable development are not pursued by organizations, local governments, and individuals. Grassroots mobilization and social agitation are necessary in order to regain livelihood security throughout rural Andhra Pradesh. In Sulthanpur, with the assistance of WASSAN, farmers are beginning to consider forming a watershed committee in order to develop a communally owned and managed irrigation project to compensate for changing rainfall patterns and groundwater decline. At the gram panchayat meeting where this initiative was proposed, farmers were incredibly eager to get started. Instead of asking – "should we do this?" – farmers were asking, "when can we start?".

Watershed initiatives are vital to increasing the sustainability of agriculture and security of livelihoods as borewell related debt is central to agrarian distress in Sulthanpur. However, efforts must be broader than water. Other expenditures, like those for seeds and chemicals, figure prominently into the debt equation as they perpetuate dependence upon the market and upon borrowing. Future initiatives must challenge all these factors as well as the entire logic of input intensive, market oriented conventional agriculture, especially in the context of small and marginal farmers. A return to closed loop agricultural systems would boost productivity and sustainability as well as ease the stress of inputs on farmer finances.

XIV. Recommendations for Future Scholarship

As mentioned previously, studies of agrarian distress in Andhra Pradesh have been fairly focused on farmer suicide and other extreme manifestations of crisis. Past studies have been

concentrated in hot spots of suicide, focusing predominately on only two or three districts in the state. This research bias is both geographic and social as it seeks the most dramatic stories and localities. In doing so, it leaves a majority of rural areas and people unstudied. Future studies of agrarian distress must make an effort to compensate for these research gaps, acknowledging that governments, organizations, and academics will never fully understand the dynamics and extent of distress unless research is more diversified, holistic, and thorough.

Similarly, greater focus needs to be placed upon varying distress burdens according to caste, class, and gender. While this subject was not the focus of this study, it became apparent throughout the research process that these social factors mediate and sometimes exacerbate individuals' and families' experience of debt. Distress is not a blanket phenomenon – future studies that examine different burdens across caste, class, and gender lines will go far to help nuance current understandings of the rural experience.

Finally, future efforts in rural Andhra Pradesh and throughout India must seek to combine research with activism in order to bridge the gaps between scholarship and livelihoods, discussion and action, and sustainable development theory and practice. After countless interviews with farmers who demanded to know how this study was going to help them repay their debt or provide their families with food, it became apparent that scholarship on its own is not enough. While further studies are vital to understanding rural distress, local governments, organizations, scholars, and people must also focus on activism and grassroots social change in order to challenge existing livelihood systems and create better ones. If we hope to find a more sustainable, secure agrarian future, we must harness the passion of these farmers, learn to revalue local knowledge and tradition, begin to reinvest in rural landscapes, and challenge the idea that agrarian decline is a fated result of economic growth and development.

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