

**Adaptation to Climate Change: An Investigation on the
Effectiveness of Formal Institutions in Kinkheda Village,
Maharashtra, India**

By

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Abstract

Climate change is a reality that is adversely affecting poor farmers, particularly those in the arid and semi-arid tropics. A wide range of institutions exist to facilitate climate change adaptation in village level settings, but the institutions are often lacking in their implementation. This study investigated the effectiveness of the various formal institutions for adaptation to climate variability and change. Analyzing the processes of the formal institutions and examining their impact on the farmers' adaption strategies helped determine how effectively the institutional schemes are operating. This qualitative case study analyzed the impact of the formal institutions on the farmers' ability to adapt to climate change in Kinkheda village, Maharashtra, India. The study involved focus group discussions and interviews with farmers and other key informants in the village to assess the formal institutions present in Kinkheda. Through the study, the formal institutions were observed to determine how they work to protect the farmers from the ecological and socioeconomic effects of climate variability and change. The study has demonstrated that all existing institutions must be properly integrated into society in order for farmers to receive the much-needed institutional benefits.

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1. Introduction

Climate change is no longer an intangible theory to be discussed in international forums; instead, its effects are being experienced worldwide through global warming and erratic weather events. The agricultural sector experiences great difficulty in adapting to the manifestations of climate change, including: floods, soil degradation, droughts, high temperatures, and erratic patterns of precipitation (ADB 2000). The effects of global warming, illustrated by the current global temperatures averaging 0.7 degrees Celsius above pre-industrial levels, are projected to have a severe effect on farmers worldwide, particularly in Asia (Moorhead 2009). Some areas of Asia are expected to experience temperature increases up to double the global average, making current farming practices obsolete and ineffective (Kleiner 1994).

The semi-arid tropics (SAT) will suffer the brunt of climate change in Asia, where both the farming practices and the farmers are most vulnerable to variability in the climate. Asia's SAT accounts for 90% of food production, and is home to many of the world's poorest (Cooper, et. al 2006). The SAT of India alone houses over 250 million rural people who work to secure an agricultural livelihood (Walker, Ryan 1990). Climate change poses a large threat to these rural inhabitants, who need consistent climatic conditions to secure their primary food and income sources.

India is a nation highly dependent on rain fed agriculture, particularly in the SAT regions. The Development of Humane Action noted that in India, 68% of the total net crop area depends on rainfall. Of food crops, 48% are rain fed, while 68% of non-food crops rely on rainwater for survival (DHAN 2002). In the state of Maharashtra, located in western India, patterns of water scarcity over the past two decades have left the farmers struggling to adapt to a series of climatic shocks. Farmers in the SAT of Maharashtra lack the knowledge and resources to successfully adapt to climate change alone, and need support from formal institutions. However, many inefficiencies in the institutional sector leave farmers vulnerable to multiple threats, including: climate hazards, resource scarcity, civil strife, market fluctuations, changing resource rights, and government policy failures (Osman, et. al 2006).

1.1 Objectives

The main objective of the study was to determine the effectiveness of the formal institutions for facilitating climate change adaptation in a village level setting.

The three main questions the research study attempted to answer were:

- What is the extent of the impact of formal institutions on the farmers' ability to adapt to climate change.
- What are the factors constraining the success of the already initiated formal methods of adaptation for the farmers, if any.
- How can governance of formal institutions, like Panchatayi Raj, be made more effective in helping farmers cope with climatic shocks.

1.2 Hypotheses

Three hypotheses were set for this study, correlating to the study's focal questions:

1. Formal institutions play an important role in adapting to climatic shocks in Kinkheda Village.
2. The extent to which one benefits from the formal institutions in place correlates to their social status.
3. Increasing the role of the farmers in policy-making decisions would have a positive impact on the operating schemes.

1.3 Limitations of the Study

Due to time and resource restraints, the study was constrained solely to the Kinkheda village. If time had allowed, a deeper analysis of at least two villages would have been conducted and the number of respondents per village (sample size) increased. Ideally, the process for selecting the villages would include one village with more effective formal institutions operating and one with

less functional institutions facilitating adaptation to climate change. In observing differences between the institutional operations, one could easily identify leakages in the system of the weaker village. Villages from two different states, such as Andhra Pradesh and Maharashtra, would have been chosen for investigation if time had allowed. With this selection, the state government processes would be able to be compared as an important formal institution. However, due to time limitations, a single village was chosen for the study. The results of this pilot study should be built upon by carrying out the study in more villages, with increased sample sizes, to verify the validity of the study and increase the breadth of results received.

1.4 Methodology

The study required a thorough examination of the Kinkheda village in July 2010, entailing interactions with farming households through focus group discussions and individual interviews. Case studies were completed on five farming households, chosen using the purposive sampling method. The sampling was done with regard to farm size/ownership and sex. The different groupings of farmers were large, medium, and small-scale farmers, including landless laborers and women.

The focus group discussions, comprised of about fifteen to twenty members each, served a dual purpose in the collection of research. They increased the significance of the study by providing an opportunity for the voices of more farmers to be included in the study, and allowed for a triangulation process to verify the responses received in individual case studies. Four focus group meetings were held: one with members of the Gram Panchayat, one with the large and medium farmers, one with the small farmers and landless laborers, and one focus group solely for women. Institutional mapping was carried out in the focus groups, which illustrates the most important institutions to each grouping. Carrying out the qualitative, semi-structured interviews in Kinkheda enabled a better understanding of the effectiveness of institutional schemes. In addition, secondary resources and ICRISAT village level studies (VLS) data from 2001-2004 were referenced and utilized in the study.

2. Kinkheda Profile Summary

2.1 History

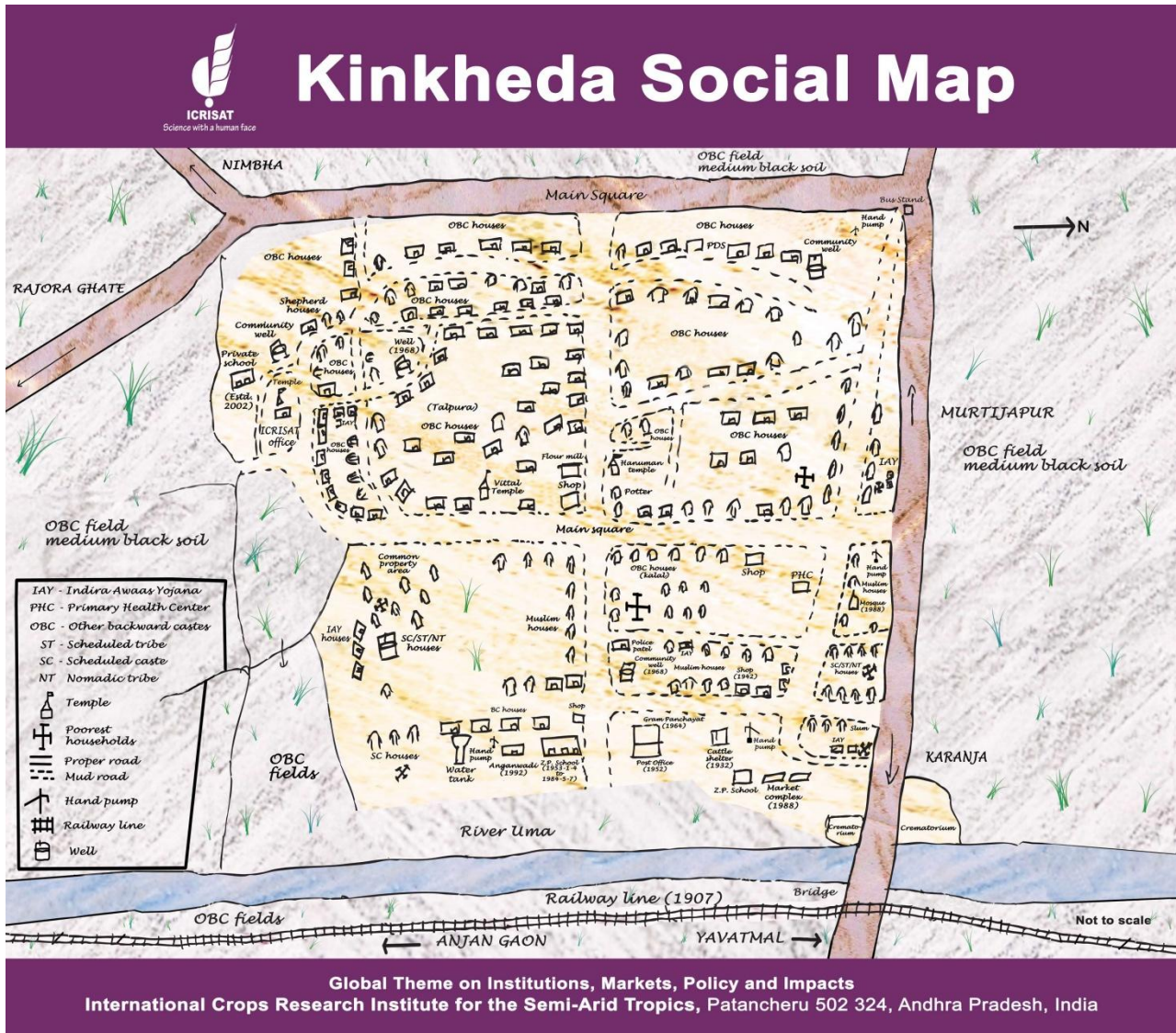
The Kinkheda village is a part of the Akola district, which is located in the Central East of Maharashtra State. The district of Akola was ruled by the Nizam of Hyderabad in the eighteenth century. The present-day Akola district was part of the Berar region in the Nizam's kingdom. In 1853, the district was forfeited to the British as a loan payment and then administered as a part of the Central Provinces (Walker, Ryan 1990). The Akola district was intensively cultivated and most famous for growing cotton. The building of a rail transport in the district increased the cotton area by 50%, which boosted the state revenue by 42% from 1867 to 1881 (Chopde VK, Kiresur VR, Bantilan MCS Draft 2009).

2.2 Present

Today, Kinkheda is classified as a part of the Vidharba region of India's SAT. The village is part of the typically rainfall-assured Akola district, without irrigation measures in place. Average rainfall in the district is 750 to 1000 mm. The three categories of soils in the district are: Medium black (72.29%), Fertile black (10.62%), and poor soil (16.99) (Chopde VK, Kiresur VR, Bantilan MCS Draft 2009). The farmland in the Akola district has a majority of medium deep black clay soils (Inceptisols), which have a moderate water-retention capacity (Walker, Ryan 1990). Medium black soils are prone to erosion, but have excellent chemical properties which can produce high yields with proper farming methods (Maertens 2009). About 189 households are present in this agricultural village, many of which have been harvesting soybeans as their dominant crop in recent years¹.

¹ Information obtained from conversation with Mr. Chopde, Senior Scientific Officer GT-IMPI, ICRISAT.

Figure 1: A social map of Kinkheda Village.



Source: Gandhi (2008).

2.3 Resident Profile

Income poverty, defined as an annual income of less than Rs 20000, defines the lives of under 40% of Kinkheda villagers, making the poverty level in Kinkheda just below average of the six VLS villages.

Table 1: Estimates of income poverty across VLS villages, 2001.

Village	Number of sample households	Number of poor	Percentage
Kinkheda	32	12	38
Total with all 6 VLS villages	446	183	41

Source: Rao, Charyulu. 2007.

The literacy rate in Kinkheda illustrates the high level of education offered in this Maharashtra village. In addition, gender inequality in education has been nearly eliminated in the village. The literacy rate for young women is nearly 15% higher than the average across all VLS villages.

Table 2: Family size and literacy levels of sample households in VLS villages, 2001-04.

Village	Total family members	Average family size	Percentage of Literates	Literacy rate of young men*	Literacy rate of young women*
Kinkheda	146	4.70	88.15	90.25	87.63
Total with all 6 VLS Villages	379	5.38	66.41	82.35	73.36

*From the ages of 5-30 years.
Source: Rao, Charyulu. 2007.

The nutritional status of the villages in Maharashtra has increased with the production of pulses, thereby lowering the percentage of protein malnutrition for the village of Kinkheda.

Table 3: Nutritional status of sample households, 2001-04.

Sample Population	Consumption per day		Malnutrition level (% of households)	
	Calories	Protein (g)	<2000 calories per day	<50 g protein per day
Kinkheda	2006	52	47	44
Average across 6 villages	2135	49	47	53

Source: Rao, Charyulu 2007.

2.4 Income Sources

Agriculture serves as the primary occupation for nearly 70% of households in Kinkheda, which is significantly higher than the average of all VLS villages, while the percentage of caste occupations in Kinkheda is lower than that of the other combined VLS villages.

Primary Occupation	Kinkheda	Total of all 6 VLS villages
Agriculture	22 (67.7)	242 (54.2)
Labor	8 (24.0)	97 (21.7)
Business	0 (0.0)	13 (3.0)
Service	2 (5.2)	16 (3.6)
Caste occupation	1 (3.1)	51 (11.5)
Others	0 (0.0)	27 (6.1)
Total of all 6 VLS Villages	32 (100.0)	446 (100.0)
*Figures in parentheses represent percentages to the column total.		
Source: Rao, Charyulu. 2007.		

All classes of households in Kinkheda recorded positive incomes from crops, with nonfarm sources still providing more income than crops. The majority of income earned by labor households, however, came from agricultural work. The significance of agriculture to a household's income increased proportionately from laborers to large farmers, while the significance of labor decreased in accord.

Table 5: Sources of household income (Rs. per year) in Kinkheda, 2001-04.

Class of Households	Labor	Small	Medium	Large	Average
Crops	19	5464	19727	24324	9134
Livestock	288	490	5889	2574	1712
Labor	17648	9464	3494	1606	9408
Nonfarm work	2038	262	0	0	624
Caste occupation	0	1286	0	0	562
Migration	1167	762	0	2000	875
Others	5309	5496	16438	34376	11111
Total	26469	23224	45548	64880	33426

Source: Rao, Charyulu. 2007

2.5 Households Sampled

Table 6: Sampled households in qualitative study.

Farmer Names*	Sabal Kolkhede	Lakshmi Chiche	Baha Udeen Tale	Baanke Bihaari Ravt	Dakshina Bahirkar
Status	Large farmer	Medium farmer	Small farmer	Landless laborer	Women-headed house
VLS No.	208	80	30	01	59
*Names have been changed to protect the villagers' identities and maintain confidentiality of the study.					

3. Institutional Adaptation

3.1 Institutions

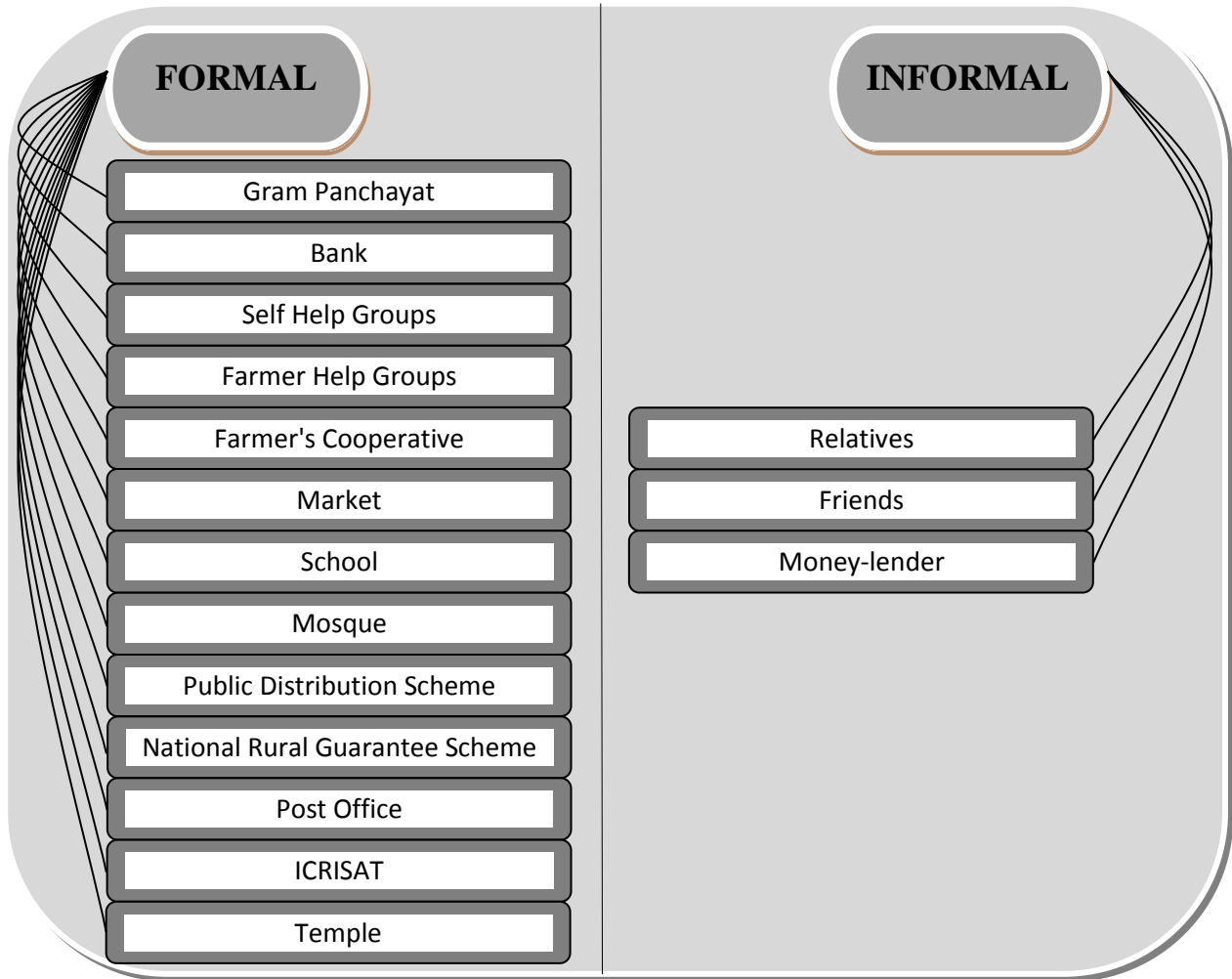
Institutions are defined as humanly-made formal or informal mechanisms which shape social and individual expectations, interactions, and behavior (Agrawal 2008). A variety of institutions exist to facilitate climate change adaptation for a village. To understand the extent of the impact the institutions possess, their internal processes, external relationships, and linkages with different social groups and households must be studied. Institutional access refers to the degree to which households and different social groups are connected to institutions and are able to gain institutional benefits due to their connections (Agrawal 2008). A household's resilience, or its ability to absorb ecological and social stress, while still maintaining its ability to self-organize and learn is dependent upon its institutional access (Duarte, et. al 2007).

Institutions are further broken down into formal and informal mechanisms, as previously stated. Formal institutions include the established rules, laws, contracts and procedures familiar to all lawyers and political scientists (Jordan, O'Riordan 1997). The existing formal methods of adaptation refer to any structured organization facilitating climate change adaptation for the village. Formal institutions operating in villages include, but are not limited to: self-help groups, private institutions (seed companies), co-operatives, banks, fodder depot, the agri. department, watershed department, and the Gram Panchayat (Banerjee, Bantilan, Singh Draft 2010).

Informal institutions often operate outside the formal legal system and reflect unwritten codes of social conduct. Examples of these social networks include: religion, caste, marriage, land inheritance, and money lenders (Livelihoods newsletter 2010). Informal institutions possess a more loosely organized structure than the formal institutions in operation. Both informal and formal institutions prove beneficial to securing the farmers' livelihoods, especially during times of climatic shock.

3.2 Institutions in Kinkheda

Figure 2: Formal and informal institutions in Kinkheda.



A large number of formal institutions operate in Kinkheda village, while the farmers listed only three informal institutions which assist their livelihoods. The classification between formal and informal institutions is semi-fluid, and Self-Help Groups (SHGs) serve as an example of this concept. Just a few decades ago, SHGs were viewed as an informal mechanism for empowering women, as they began to emerge and strengthen village life. In 1992, SHGs began to be directly financed by a Commercial bank, as the National Bank for Agriculture and Rural Development (NABARD) launched the pilot phase of the SHG Bank Linkage Programme (Abeysekera 2009). The SHGs continue to be recipients of government loans and benefits, thus, making them a formalized institution.

3.3 Local Governance Structure

The Panchayati Raj Institutions are represented by a nine member, elected Gram Panchayat at the village level. Kinkheda is a member of a grouped Panchayat due to the small size of the village (under 200 households). The four villages of varying sizes joined in this Panchayat are: Kinkheda, Kamata, Lasanapur, and Pimpalshenda. These villages share the same Sarpanch, who is nominated by the Gram Panchayat members. Due to affirmative action regulations, the current Sarpanch had to be both a woman and a member of the Backward Caste. These affirmative action regulations apply to a percentage of the total Gram Panchayat committee as well, which is indicated in figure 3 below.

Figure 3: Members of the Kinkheda grouped Gram Panchayat.

Name	Position	Village
D. J. Mhasal	Sarpanch	Kamata
A. A. I. Chaus	Vice-Sarpanch	Kinkheda
P. R. Kolkhede	Member	Kinkheda
S. H. Tambde	Member	Kinkheda
P. S. Neware	Member	Kinkheda
D. J. Gorale	Member	Lasanapur
S. V. Golam	Member	Pimpalshenda
J. Patil	Member	Pimpalshenda
R. Thombare	Member	Kamata

*The above shaded boxes indicate the members of the Gram Panchayat that are women.

One other key position in the local governance structure is the Gram Sevak, who executes and monitors the schemes, compiling the government records at the village level. Kinkheda's current Gram Sevak is Mr. Rahul Nikhade, who serves as the secretary of the Gram Panchayat.

4. Results and Discussion

4.1 Role of Formal Institutions

The first focal question for the research study attempts to determine the extent of the impact formal institutions have on farmers' abilities to adapt to climate change. Before assessing, rating, or making suggestions regarding the impact, information was gathered on the existing relationship between the formal institutions and the farmers. The correlating hypothesis framed on the first research point was:

- Formal institutions play an important role in adapting to climatic shocks in Kinkheda.

In evaluating this hypothesis, the institutions operating in Kinkheda were identified. In addition, an understanding of the livelihoods and adaptation strategies of the respondents was sought. The institutions operating in Kinkheda were determined during focus group discussions by the process of institutional mapping. In institutional mapping, a circle was drawn to represent the village and three different sized circles were placed on the village depiction to represent operating institutions. The different sized circles of small, medium, and large were chosen by the farmers in the focus group discussions to signify the importance of the institutions to their livelihoods. The position where the circle was placed on the chart signified how many people in the village were assisted by the program. The institutions placed in the inner circle help the majority of people in the village, while those placed near the edge of the outer circle help fewer people in the village. Table 7 displays what the most important institutions and schemes were to the Kinkheda villagers, while Figure 4 illustrates the institutional mapping process.

Table 7: Most vital formal institutions and schemes in Kinkheda.

Women	Small farmers and Landless Laborers	Medium and Large farmers
School	School	School
PDS	Gram Panchayat	PDS
Midday Meal Scheme	Midday Meal Scheme	Water Irrigation system
ICRISAT	ICRISAT	Drinking Water
		Indira Awan-Yojana

*The above programs were both given a large circle and placed in the center circle during institutional mapping.

Figure 4: Institutional mapping depiction (women's focus group discussion).



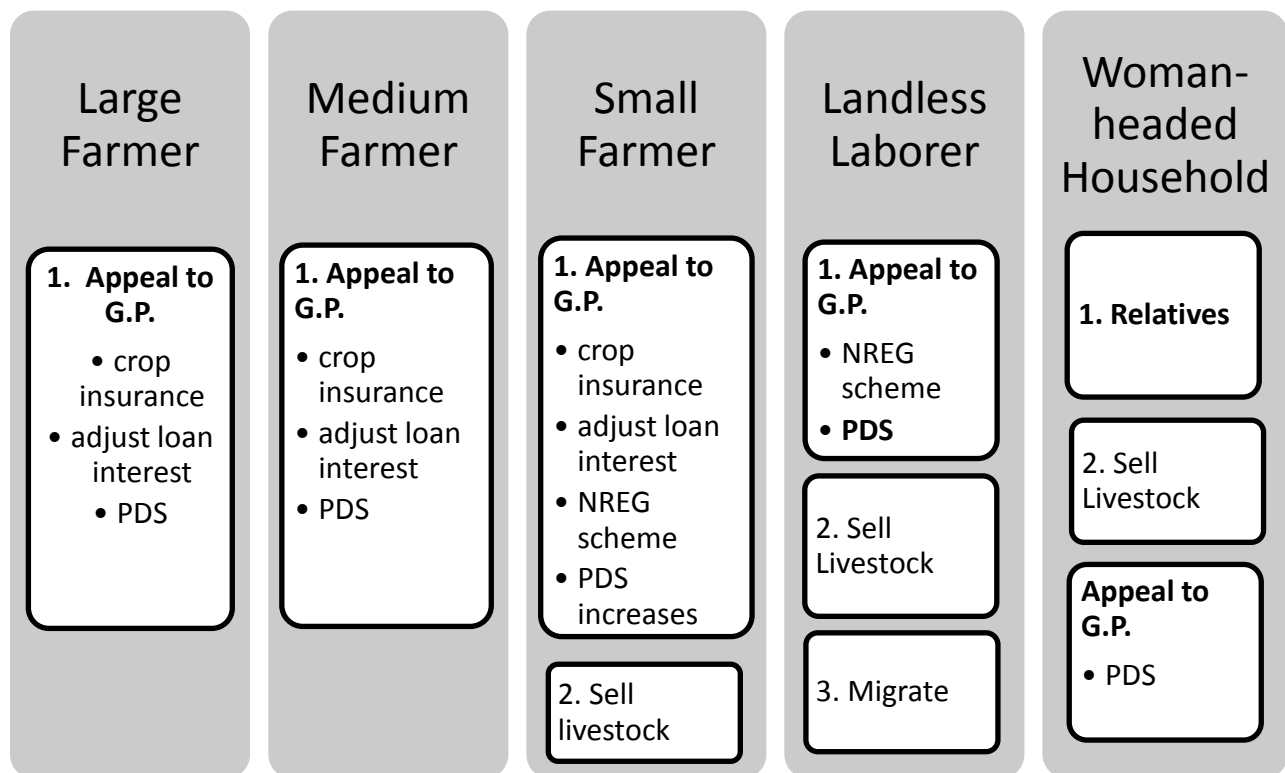
Although the focus of this study was on the formal institutions in Kinkheda, informal institutions were included as well to give a true assessment of all local institutions which aid in adaptation to climate change. One of the informal institutions farmers listed as utilizing was the moneylender. Moneylenders are classified as an informal institution due to their illegal status in the village. However, the moneylender still plays a vital role in the farmers' lives. During a time of crop failure or financial crisis, the moneylender may be the only method by which to obtain funds. Moneylenders, therefore, are viewed as a necessary evil to many farmers, and the illegality of this vital institution may not be in the best interest of the villagers.

Moneylenders charge high interest on the loans they provide. If moneylenders were legalized, the interest rates and loans provided could be more carefully monitored by the government and better assist the farmers². Informal institutions were utilized by all farmers at one time or another, but typically not as a primary source of assistance. The informal institutions operating in Kinkheda oftentimes save the farmers when the formal institutions are unable to assist them.

² Idea gathered from discussion with Rupsha Banerjee, Consultant/Applied Sociologist, GT-IMPI, ICRISAT.

Individuals from each group included in the study responded that institutions hold a high importance in their lives when facing a climatic shock. The most popular coping mechanism mentioned by farmers was voicing their grievances to the Gram Panchayat. By appealing to the village level of the Panchayati Raj institution, they hoped to access government aid and to have the year declared as a drought. This aid could come in the form of crop insurance, a forgiveness or adjustment of loans, an increase in the public distribution scheme (PDS), or employment generation. Figure 5 presents the methods by which the villagers attempt to adapt.

Figure 5: Responding to climatic shocks - case studies of adaptation methods.



The Gram Panchayat holds a role of high importance to farmers in the Kinkheda village when responding to a climatic shock. The first response given by the representative of each category, other than the female-headed household, listed utilizing a government scheme as the first response to a climatic shock. The female-headed household, although she listed an informal institution as her first response, still cited the PDS shop as substantially benefitting her household. Therefore, the role of formal institutions is important in adapting to climatic shocks in Kinkheda.

4.2 Factors Constraining Success

Formal institutions in Kinkheda possess many flaws which decrease their effectiveness and limit their ability to benefit more farmers through operating schemes. The hypothesis correlating to the second area of the study stood as:

- The extent to which a household benefits from the formal institutions in place correlates to the social status of its members.

An efficient method to evaluate institutions in Kinkheda is to compare the scheme implementation with other VLS villages. Tables 8 and 9 depict the institutional shortcomings in Kinkheda. Few to no farmers participate in or benefit from existing institutional schemes; therefore, further investigation into the factors causing these failures is required.

Table 8: Participants in development program, % in village, 1975-1983, 2001, 2005.

	Total	Aurepalle	Dokur	Shirapur	Kalman	Kanzara	Kinkheda
No. Of Observations	426	66	75	77	86	86	36
Participation in at least 1 Programme	47%	50%	49%	56%	73%	29%	0%
Housing	9%	9%	3%	7%	19%	13%	0%
Agriculture	25%	0%	13%	26%	70%	21%	0%
Drought Relief	9%	4%	17%	0%	0%	0%	0%
Human Development	11%	12%	37%	8%	3%	0%	0%

*Sample based on 426 individuals present between 1975-1983, 2001 and in 2005. "Housing" includes: subsidy on the construction of houses, subsidised toilet construction and housing scheme. "Agriculture" include: agriculture input subsidy, subsidy on the purchase of agricultural machinery, and subsidy of bullocks. Human development programmes consist of: female development programmes (family planning and nutrition), child development programmes (support to bonded and child labour, anganwadi, school boys rice), social safety nets (Cheyutha camps and the national family benefit scheme) and education (educational scholarships).

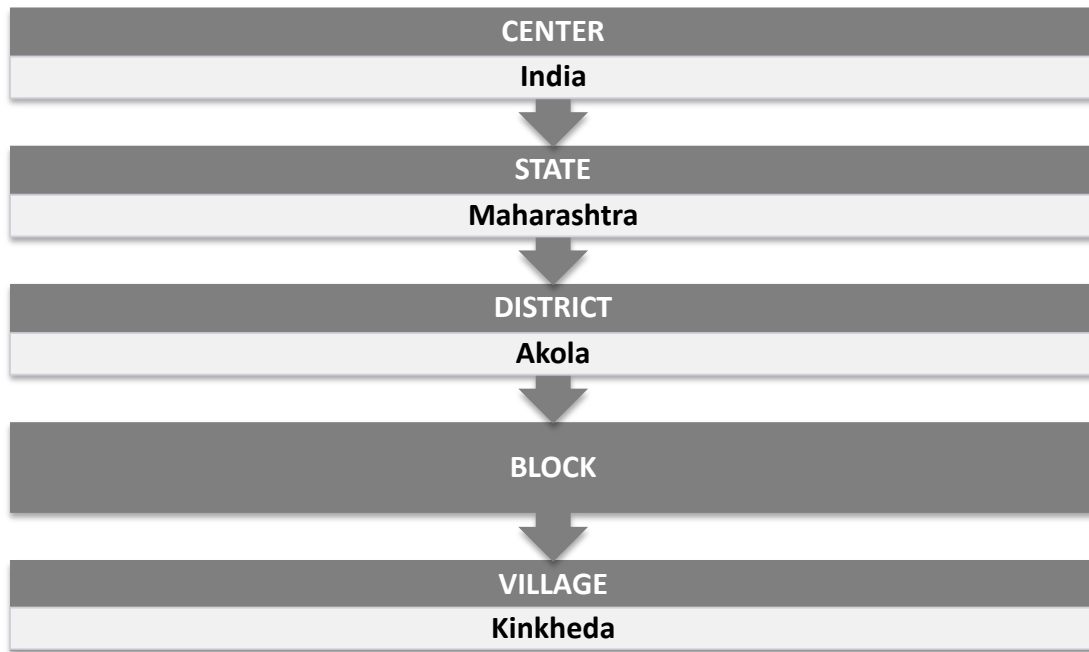
Source: Badiani, Dercon, Krishnan. (Draft 2006).

Table 9: Benefits to participants (Rs., 2001 Prices).							
	Total	Aurepalle	Dokur	Shirapur	Kalman	Kanzara	Kinkheda
Total Benefits Received	4874	1744	4993	2615	7083	7148	0
Housing	6540	3767	2000	2500	11250	3864	6540
Agriculture	4144	0	5400	1333	3844	7567	0
Drought Relief	1009	586	1823	0	0	0	0
Human Development	1472	663	1662	2114	773	0	0
* Sample based on 179 individuals who were present between 1975-1983, 2001 and in 2005, and reported having participated in a anti-poverty programme between 1985 and 2001. 2001 prices are used.							
Source: Badiani, Dercon, Krishnan. (Draft 2006).							

Significant inefficiencies are present within the institutions of Kinkheda village. In addition, Kinkheda shows the least effective institutions in operation when compared to the other five VLS villages. The lack of participation displayed in the above tables was supported by the data collection in Kinkheda. However, this failure in the implementation of development programs observed was not a fault of the farmers, but rather, a fault of the institutional operations.

Crop insurance serves as just one example of a scheme the farmers would attempt to utilize in response to a climatic shock. The scheme falls under the umbrella of the Panchayati Raj institution, and is implemented by the village level government body - the Gram Panchayat. In the drought-prone Akola district, crop insurance is particularly important to the farmers when working to cope with a climatic shock. However, not one farming household involved in the study of Kinkheda was assisted by the crop insurance in past incidences of drought. The ineffectiveness of the crop insurance scheme is due to a variety of factors along the complex process of having a drought declared for the district and channeling the aid down to the village level. Despite the failure of the crop insurance scheme, the farmers are still required to invest in crop insurance, considering the insurance is packaged in all agricultural loans. Due to the past failures of the crop insurance scheme, farmers ranked this scheme as unimportant to their lives and unhelpful to the majority of villagers during institutional mapping sessions.

Figure 6: Disbursement of funds in the Panchayati Raj institution.



Crop insurance is currently run by the state level, but even in the transit from the state level to the village, the development and relief funds are passed through many hands. Bribery is a large issue of concern within Indian institutions, both on a micro and macro level. The villagers sampled acknowledged bribery as a common occurrence in the institutional system and an accepted norm in order to receive institutional aid or benefits. When questioned about any existing checks or balances in the system, the farmers spoke of the little transparency present. Their only recourse for reporting corruption experienced is to appeal to higher authorities, which, if discovered by local officers, would risk their future access to institutional aid.

The combined medium and large farmer focus group estimated 75% of allotted money was properly used and 25% lost to corruption, while the women's focus group believed only 50 - 60% of money was properly utilized. The farmers expressed their distaste for the act of paying bribes, but largely accepted paying them in order to gain access to the benefits. The two groups least willing to pay the bribes were the landless laborers and women. These groups spoke of the bribes serving as a disincentive to utilize government schemes due to the greater difficulty they have in affording the bribes. The women focus group shared that they would fear alienation from the village if they spoke out against the corruption, which is why they tolerated the bribery.

The focus group discussions held with Gram Panchayat members and farmers of Kinkheda highlighted some of the largest factors decreasing effectiveness within institutional operations. Table 10 presents the areas of inefficiency mentioned by villagers of Kinkheda.

Table 10: Largest concerns regarding institutional operations in Kinkheda.	
Response of Gram Panchayat Members	Combined Response of Farmer Groups
I. Officials do not come to village to investigate implementation of centrally sponsored schemes.	I. Errors made in the distribution of BPL cards.
II. Crop insurance is only offered when the complete block has a massive crop failure.	II. Financial disincentives to utilize government schemes which discourage participation.
III. Political and unequal distribution of funds and resources to western Maharashtra.	III. Institutional access of a household dependent on political and personal connections.
IV. Money for operating schemes is not channeled to village level until the end of the schemes.	IV. The loss of control or protection from the fluctuating market prices.
V. Rupees sent through post for the grain subsidies must be spent in the same day received.	V. Few opportunities exist to allow farmers to repeal faults or influence changes in the system.

Many leakages currently exist in the system which decrease the effectiveness of the institutions, particularly in the formal sector. The villagers of Kinkheda experience these inefficiencies daily, and therefore, are the ones best suited for assisting with recommendations for change. Current institutional schemes prove ineffective in terms of participation and benefits distributed, as has been illustrated through both past VLS data presented and data gathered from this study. In addition, a household's institutional access is largely based on the social status of its members. Box 1 shares the case study of Dakshina Bahirkar. Dakshina serves as an example of a women who possesses little access to formal institutions due to her social status.

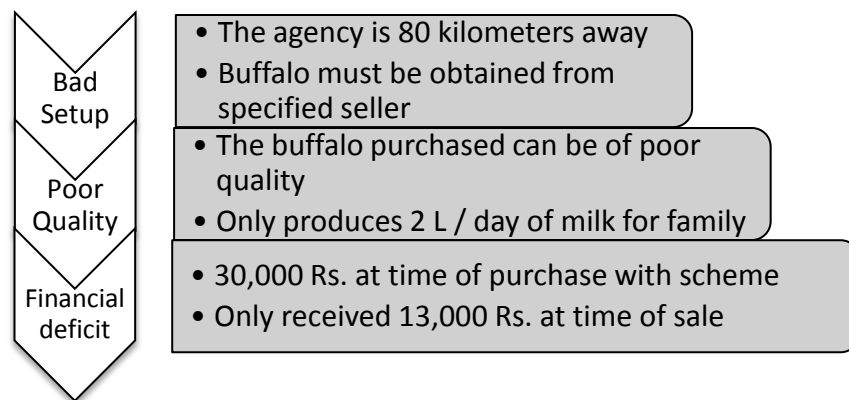
Box 1: Case study of institutional discrimination - women-headed household.

Dakshina represents the women-headed household in the study. Her husband, a farmer, committed suicide in 1982, leaving her to run the household. Dakshina expressed frustrations with her relationship to the formal institutions, based on her previous appeals for help left unanswered. She has attempted to utilize government schemes in the past, but has been repeatedly turned away and told to return a later day by the government personnel. Figure 4 on page 20 documented her first response to a climatic shock which differed from the members of all other social groups sampled. Dakshina listed her first response as appealing to her relatives - an informal institution - for assistance, and her second option as selling livestock. She has lost hope and trust in the Panchayati Raj institution due to her history of being ignored and set aside by the government. Due to the partiality in the system, households such as Dakshina's are left without access to aid they need and deserve.

Dakshina was aware of the schemes she was eligible for, and experienced discrimination when attempting to access deserved resources. However, an even graver situation occurs throughout the village in the disbursement of information. Oftentimes the most disadvantaged members in the village have little knowledge of the schemes which exist to benefit them. The large and medium farmers cited numerous schemes during focus group discussions which exist solely to aid the BPL villagers, while BPL residents made no mention of these institutional benefits for which they were eligible.

An additional area of concern for farmers was the poor implementation of institutional schemes. Lakshmi Chihche, a medium farmer, highlighted inefficiencies within the farmer help groups. Figure 7 shares how, by utilizing the institutional scheme, Chiche was financially disadvantaged.

Figure 7: Case study illustrating disincentives for utilizing farmer help groups.



Lakshmi Chihche suffered this great financial loss by relying on the institutional scheme which is created for the purpose of assisting farmers. He voiced his frustration in regards to the rules the government requires one to follow in order to utilize the schemes. By following the guidelines required for him to purchase the livestock, he feels he received only 20% of the benefits, when he should have received 100%. In the future, he plans to purchase livestock without allowing government intervention due to his negative experience.

Tamali Bilewar also suffered from an improper implementation of institutional schemes. She was eager to tell of her hardships regarding the faulty administering of BPL cards in the women's focus group discussion. Box 2 shares her story of gender-based discrimination.

Box 2: Case study of unjust denial of BPL card, Tamali Bilewar's story.

Tamali Bilewar does not possess ownership to any land, and scrapes by each month, living below the poverty line (BPL). All BPL residents of Kinkheda are to receive a BPL card, which then qualifies them to receive rice and other goods from Public Distribution Scheme Shop at a subsidized rate. However, Tamali has been repeatedly denied her right to a BPL card. She went to the Block level officers to appeal this injustice, but received erroneous information that she was required to take out a loan to receive a BPL card. Tamali feels as if she has been slighted by the Panchayati Raj institution, and has given up hope in the institutional system. She will continue to purchase her rice at full price for lack of any viable alternative.

The case studies enclosed in Boxes 1 and 2 serve as only two examples of injustices occurring within the institutional sector in Kinkheda. The women, landless laborers, and even small farmers spoke of the alienation they felt from the institutions. Many respondents interviewed in these categories, both individually and in focus group discussions, shared their experiences of feeling ignored by and isolated from operating formal institutions, particularly the Gram Panchayat. However, Baha Udeen Tale, the small farmer interviewed, possessed enthusiasm and optimism which was not found among others of his status in the focus group discussion. The difference in Baha Udeen's status was that in addition to his agricultural lifestyle, he also worked in the PDS shop, which provided him with greater connections, in addition to an increased access to information and institutional benefits. The institutional access of a household has indeed been found to be dependent upon its members' status in society.

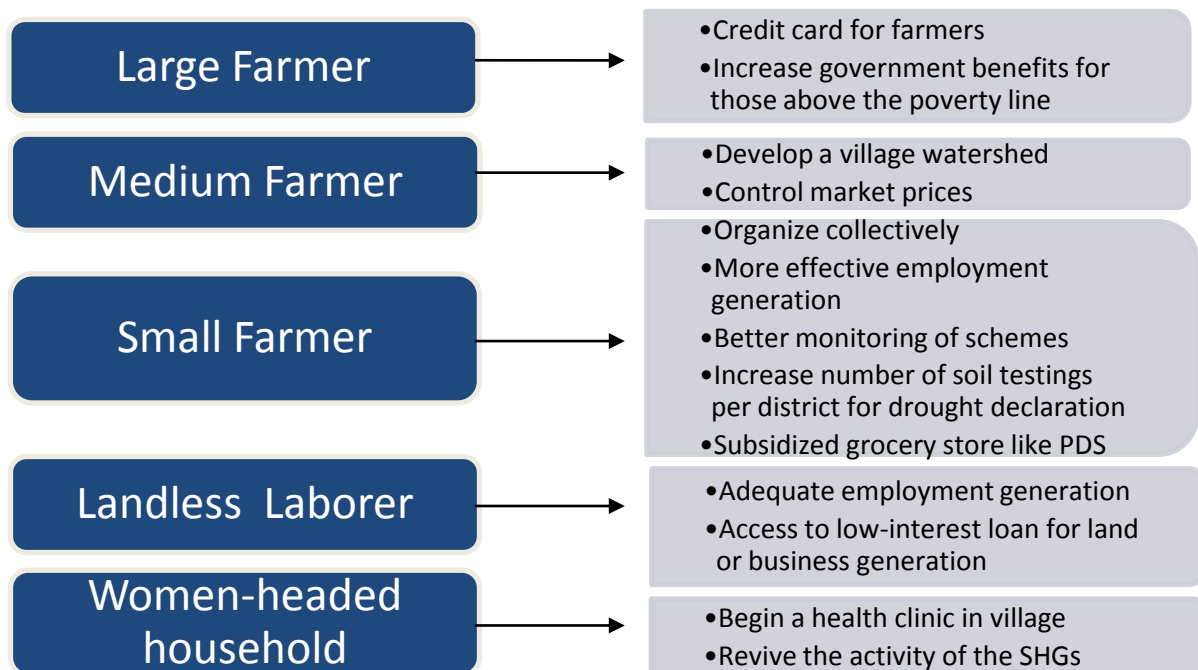
4.3 Suggestions for Improvement

The third and final part of the three dimensional study focused on how the governance of formal institutions, like Panchatayi Raj, can be made more effective in helping farmers cope with climatic shocks. The Gram Panchayat is one of the only formal institutions the farmers feel they can turn to when facing a climatic shock, yet they have little guarantee in the proper implementation of schemes. The following hypothesis was tested in this area of the study:

- Increasing the farmers' role in policy-making decisions would have a positive impact on the operating schemes.

The Kinkheda farmers bear the hardships associated with life in India's SAT each day, and best know what schemes needed to be implemented into the village. Below are the answers received from each social stratum. The response from each category clearly illustrates what the priorities are for the individuals within the group.

Figure 8: Schemes desired by the Kinkheda villagers - a case study.



The plight of each group of farmers is entirely different, as are the suggestions they provide for changes to be made to the institutional system. The large farmers would benefit from easier

access to credit, without having to visit the bank to obtain a loan. The farmers provided the example of businessmen, who were able to obtain a credit card for purchases and repay the loan later. Sabal Kolkhede and the other large farmers would like this privilege to be made available to them as well, through a program such as the Kisan Credit Card (KCC) Scheme. The KCC scheme was begun by the Government of India, in collaboration with the Reserve Bank of India and the National Bank for Agricultural and Rural Development (NABARD) from 1998-1999. The scheme provides agricultural credit cards to farmers to meet their credit needs in a more efficient manner than obtaining a bank loan for all agricultural expenses (Faruqui 2001).

The medium farmers were more concerned with the exploitation by the middle man, and wanted to develop a plan which would provide them with security from the fluctuating market prices. The prices farmers receive for their crops at the market plays a vital role in determining whether they have a successful or unsuccessful financial year. In addition, Lakshmi Chihche spoke of Kinkheda's dire need for better water management to assist with climate variability and change during his individual interview. Chihche saw the development of a watershed as a great opportunity for employment generation in the village. He also spoke of farmers like himself being willing to donate time and labor if they could only receive the institutional funds to begin the project.

The three more vulnerable categories of farmers were spoken with next: the small farmer, landless laborer, and women-headed household. These respondents eagerly shared the ways in which their livelihoods could be improved through institutional mechanisms. Baha Udeen Tale, the small farmer interviewed, knew he was powerless alone and felt if he could collaborate with other small farmers in the same situation as him, he would gain a greater voice. Baanke Bihaari Ravt, a landless laborer, shared of his desire to obtain access to credit. If the government could provide him with a loan, he felt he would be able to obtain the resources to begin a small business or agricultural plot. With this secured source of income, his livelihood would be strengthened. Dakshina Bahirkar and the women focus group spoke of the most important issue to their group. Although they largely felt ignored from the formal institutions, the scheme they would implement was one for the betterment of all villagers. A health clinic was mentioned as their highest priority need for Kinkheda, due to the twelve kilometer distance to the nearest health services.

Throughout the contact with Kinkheda farmers, a recurring theme surfaced. The farmers stated the institutions were not properly functioning and they had little power and few opportunities to have their opinions heard. However, if they would appeal to the government with a group, they felt as if they could obtain a more favorable response. If labor organizations and farmer groups in Kinkheda could become more vocal and committed to acting collectively, the level of political and social participation would increase within the village. Accordingly, the power of the farmers in society would strengthen with the development of a farmers' forum to interact with and appeal to government authorities. Ideally, a higher level government employee could also be in attendance to document the concerns of the Kinkheda farmers.

The movement towards collective action to redress inequities in a village level setting is not a new concept for southern India. The Maharashtra state government needs to look no further than to the neighboring state of Andhra Pradesh to view great success with the Self Help Group (SHG) movement. Take the Dokur village as an example, which now has thirty-three active SHGs operating. Their government has encouraged involvement in these voluntary societies by providing access to credit, gas connections, and pensions (Rao, Babu, Bantilan 2009).

Institutional incentives are necessary to engage and motivate the Kinkheda villagers to act collectively due to the fact that cultural and societal disincentives prevail. The same farmer who spoke to me about the increase in power and influence he would gain by acting in a group chose to not be a member of a farmer help group. The reasons he cited for his lack of participation were based on the conflicts which can arise when villagers act collectively. However, judging from the success of Andhra Pradesh, and the Dokur village, societal disincentives can be overcome with economic benefits from efficiently-operating institutions.

In order to ensure improved operations of formal institutions in Kinkheda, greater transparency and accountability needs to be achieved in the system. The farmers have little concept of the funds received by the local institutions, such as the Panchayati Raj, or how they are utilized. Transparency can be increased by the distribution of a public statement detailing funds received and the method of utilization. In addition, government authorities should make routine investigations into the village to increase the checks and balances in the system.

5. Summary of Information Gathered

5.1 Key Findings

The results of the study were as follows:

- **Finding I:** Although the formal institutions in Kinkheda possess many inefficiencies, their role remains essential in facilitating adaptation to climatic shocks in Kinkheda.
- **Finding II:** A household's institutional access, or the extent to which it benefits from the formal institutions in place, correlates to the social status of its members.
- **Finding III:** By increasing the opportunities for collective action and farmer-government interaction, the farmers' power and voice in society would increase, resulting in more successful institutional schemes.

5.2 Recommendations

The formal institutions operating in Kinkheda struggle to achieve proper implementation and leave much to be desired in terms of efficiency. The institutional access of a household correlates discriminatorily to the status and power held by its members in society. However, in spite of the myriads of failures and shortcomings from the formal institutions, such as the Panchayati Raj, these institutions still play a vital role in facilitating adaptation to climate change for Kinkheda Village. The following recommendations should be taken to address the dysfunctional aspects of the institutional systems in the village setting and increase their effectiveness.

- A) Draft framework for scheme alterations, based on farmer recommendations (See Figure 8).
- B) Develop a forum to facilitate villager-government interaction, with outside officials present.
- C) Mandate periodic visits by a government official to investigate implementation of schemes.
- D) Publish and distribute government scheme records to educate and increase transparency.

E) Establish a free service farmers can utilize to receive information and counsel on institutional schemes for which they are eligible.

F) Encourage collective action in the village by increasing economic and social incentives.

5.3 Future Implications

The qualitative study of formal institutions carried out in Kinkheda village not only investigated the effectiveness of formal institutions in adaptation to climate change for the study alone; it also began the process for analyzing what the most trustworthy institutions are in Kinkheda for the possibility of a future grant. Since the VLS program began, over three decades ago, ICRISAT has been working with the villages and providing them with education and tools to fight poverty. Looking forward, there are many opportunities for further growth and involvement in the VLS villages through continued guidance and support, in addition to new grant possibilities. The research data obtained in July 2010 from Kinkheda Village can serve as a foundation of knowledge for the continuation of this project.

From the study it can be gathered that the village of Kinkheda is in dire need of assistance within the sector of formal institutions. With deeper studies into the institutional processes and adaptive strategies of farmers in the village, the most reliable and efficient formal institution can be identified. By carrying out these studies in advance of administering a village level grant, the proper implementation of grant money given can be ensured. Throughout the two month study of Kinkheda, inefficiencies in each operating formal institution were identified. Therefore, a flawless institution does not exist in the village for handling grant money. Further studies are needed to narrow in on the institution and scheme, which, if created, would be most beneficial to all villagers. Several broad guidelines were set from this study to keep in mind when looking forward to a grant possibility in Kinkheda.

5.4 Guidelines for administering grant

- Utilize farmer input received on schemes needed (See Figure 8).
- Ensure follow-up of program/s initiated by closely analyzing the implementation process.
- Give grant over time period in small increments rather than in a lump sum at project's beginning.
- Work to avoid discrimination on the basis of social status in those who benefit from the aid.

In order to best assist the villagers of Kinkheda with any potential scheme initiated in the village with full or partial support from ICRISAT's proposed grant program, the farmers must be involved in the decision-making process. The farmers are those who best know the areas where Kinkheda is most in need of outside aid. After identifying the scheme or schemes which could benefit Kinkheda, the implementation must be closely monitored over a defined time period. By doling out the grant funds over time, the progress can be better tracked to decrease the possibility of corruption and to increase transparency in the system. The final guideline is the most important in ensuring equitable distribution of the aid throughout the village. If aid was granted to Kinkheda, its purpose would be to assist all members of the village, especially the most vulnerable. Therefore, the institutional discrimination which was made apparent in this study cannot be allowed to infiltrate the grant program. The institutional access of all Kinkheda villagers must be universal and equitable for any new scheme which would be initiated by an ICRISAT grant.

Although the formal institutions in Kinkheda do not yet appear ready to properly utilize funds received from a grant, the farmers are ready. By carrying out further analyses in Kinkheda and developing a structured plan for implementation with the aforementioned guidelines, an ICRISAT grant program could have great success in the village.

5.5 Conclusion

The effects of climate variability and change severely decrease farmers' abilities to obtain a sufficient harvest to provide for their needs, particularly in the Semi-Arid Tropics. Many scientists further predict that current climatic variability will be exacerbated by the continued process of global warming, stimulating more difficulties with rain fed agriculture in India. Due to climatic challenges, formal institutions must play a vital role in assisting the farmers with adaptation strategies. The farmers involved in the study did not perceive long term climate change as much as they did climate shocks and variability. Therefore, future questionnaires should focus on shorter term effects of the long and systematic climate change occurring.

The study determined that although formal institutions play an important role in facilitating adaptation to climate change in Kinkheda Village, many leakages are present in the system. In order for farmers to successfully combat negative effects of climate change, the institutional sector must be significantly bolstered. An ICRISAT grant partnership with Kinkheda could be instrumental in creating access for farmers to schemes which would better their livelihoods. While moving forward with the proposed program, however, many lessons learned from this study must be taken into consideration.

The main factors hindering the success of institutional interventions in Kinkheda are: few existing checks and balances in the system, poor policies, and discriminatory access to institutions. The institutional sector in Kinkheda is manipulated and controlled by the dominant members of the village. To allow a greater institutional access for the poor and socially isolated, the status of the vulnerable members of society must be increased. An excellent method to increase the voice of the villagers is to encourage collective action by providing social and economic incentives. Opportunities for farmer-government interaction must increase in accord, as the institutional sector is required to remove the veil which has been masking its operations. Transparency, accountability, and universal institutional access are three themes which need to be integrated into Kinkheda's institutional operations. By following the recommendations provided in the body of this report, the institutions in Kinkheda will be able to better assist farmers in adapting to climatic changes and challenges in the future.

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