CHAPTER 1: INTRODUCTION

The poetry of earth is never dead:
When all the birds are faint with the hot sun,
And hide in cooling trees, a voice will run
From hedge to hedge about the new-mown mead…
John Keats[1]

1.1 The River and the Sand

What is a river? The most general answer will be a natural stretch of flowing water. But for people of different perspectives, a river has different identities. The scientist may say that the river runs between a high point in the land to the sea level, obeying the laws of fluid dynamics all along. A geographer may say that a river is a shaper of landscapes. A historian might look at it as the cradle of ancient civilizations. A bank dweller might feel its existence as a constant companion, sometimes blissful and thus the source of sustenance in his life, at other times wrathful and destroyer of his home and family.

It is only natural that a stretch of arguably the most precious resource of mankind, water, will have many identities. All of those different identities are complimentary in a sense, and sometimes they do overlap with one another. However, for this paper, a river is mainly seen as an agent shaping and reshaping

the social landscape of a given area. The river in question is the Ajoy[2], a major tributary of the main distributary channel of the Ganga (better known as the Ganges in English), the Bhagirathi-Hooghly River which flows through the state of West Bengal to merge with the Bay of Bengal, thereby draining the water of the lower reach of the Ganga inside India. The Ajoy river is nearly 370 kilometers long and flows through many different localities, some known as major industrial centers in West Bengal, others nondescript villages teeming with farming population. The area covered in this study is a nearly 30 kilometer long stretch of the river as it nears the town of Bolpur, one of the best known places along its bank. The river is well known in Bengal's folklore; it was once the defining feature of the land I seek to explore in this study, and was the main route for communication. It is also known for its repeated floods from historic times. Of late the river has become a source of income for the bank-dwellers in a most direct sense, as they lift the golden sand carried by the stream and sell it to the construction industry. The sand is the most dominant feature of the river as well, as the stream is very thin except in the season of Indian Monsoon. In the drier months, the river bed is mostly dry, with the svelte stream cutting across stretches of golden sand and past massive sandbars. When the river floods, the same golden

sand is carried by the raging floodwater and deposited onto the fertile croplands near the river. The same golden sand that generates income in dry months becomes a curse for the farming villagers.

As this study is an account of the social landscape in a river basin region, an introduction of the meaning of landscape to the sociologist is called for at this stage. The word is not used for a vista or for simply describing a place; it signifies a dynamic concept that has many dimensions and has been food for thought for scholars in various disciplines.

1.2 Landscape

The word *landscape* is used primarily for a visualization of the reality associated with a particular place. As John Brinckerhoff Jackson (1984) has put it:

> …..a landscape is a "portion of land which the eye can comprehend at a glance." Actually when it was first introduced (or reintroduced) into English it did not mean the view itself, it meant a *picture* of it, an artist's interpretation. It was his task to take the forms and colors and spaces in front of him---mountains, river, forest, fields, and so on---and compose them so that they made a work of art (Jackson, 1984: 3).

The artistic quality in the landscape has often been seen as something inherent. In reality though, a landscape can have an inherent quality, but, as we

shall see, it has been constantly modified by agents both non human and human, and thus has come to possess qualities which are either secondary or even designed. Nonetheless, there seems to be something artistic attached to the word, for:

> Environmental designers, I have noticed, avoid the word *landscape* and prefer *land* or *terrain* or even *space* when they have a specific site in mind. *Landscape* is used for suggesting the esthetic quality of the wider countryside. (Jackson, 1984: 3-4)

Jackson (1984) defines a landscape as:

> a space on the surface of the earth; intuitively we know that it is a space with a degree of permanence, either topographical or cultural, and above all a space shared by a group of people; and when we go beyond the dictionary definition of landscape and examine the word itself we find that our intention is correct. (Ibid: 5)

The word *landscape* has two syllables. The first is *land*, and it has had different connotations in different regions and across different ages. In some cultures, it just meant a tract of earth, while at some parts of the world the equivalent of the word signified agricultural plots (Ibid: 6). The second syllable, *scape* has a root similar to *shape*, which once meant a composite whole of similar objects. It was also used to indicate the collective aspects of the environment (Ibid: 7).

It is this aspect of the concept of *landscape* that I shall primarily focus upon in this work, *landscape* as *the integrated whole of different environments in a particular location.* Though it is situated at a particular location, it is a dynamic concept: many of its identities change continuously, metamorphose into new identities and some identities are nearly everlasting. To analyze such a concept, we require a toolkit that consists of a variety of tools, in other words, we need a multidisciplinary approach. Roe (2007) has said:

> Landscape has become an increasingly important cross-disciplinary area, which draws contributions from both arts and science-based subjects including art, literature, ecology, geography and much more. The study of landscape issues is increasingly being funded by both science and arts-based agencies and grant-making bodies which indicates a growing recognition, at many levels, of a focus on 'landscape' as a useful way to examine a host of social, ecological and economic issues. Perhaps the most useful is that it provides a holistic and integrated basis for such examination (Roe, 2007: 1).

Scholars of environmental science have also been involved in landscape as of late the concept has been associated with the concept of sustainability. As the world is increasingly being threatened by global warming, resource depletion and biodiversity loss, concern over a place's environment now takes a prime seat in the disciplines of landscape planning and environmental resource management.

The complimentarity between various approaches to landscape studies have also come to be appreciated by many scholars (Roe, 1997). The concept of sustainability is a debated one, though it has become a catchphrase in environmental and planning literature of late. This has prompted some scholars to seek an alternative dictum, which strives for a holistic view of things. An attempt at such holism has required bridging the gap between the 'observer' and the 'observed', in other words the 'consumers' of a given landscape and the 'inhabitants' of the same. It has been realized that there are different realities for different segments of the human society, and that facts themselves are perceived phenomena governed by learned experiences. Argyrou (2005) has said:

> For a long time, by all accounts the last few centuries, nature was perceived as an intractable domain of utility and danger which, as the language of the nineteenth century would have it, was to be mastered, tamed, brought under 'man's' control, bent to his will, forced to reveal her secrets, compelled to satisfy his needs and minister his happiness….The corollary to this vision was that 'man' could, and should do all of the above. For it was only to the extent that he asserted himself in this way that he would fulfill his destiny and become what he was meant to be---the Subject of the world and in control of his destiny….those men who had a different view of themselves and their physical surroundings were perceived, treated and quickly learnt to treat themselves as 'primitive' or, in the postwar, postcolonial lexicon, 'traditional' and 'underdeveloped.' …In less than three decades, the modernist 'physics' and 'anthropology' have been transformed fundamentally, indeed, in many ways practically reversed. In the

> paradigm that has now become dominant, nature is neither refractory nor a state---'the state of nature'----and a predicament. On the contrary, as most people would now say, it is a system of immense complexity that hinges on a precarious balance currently under severe strain, a fragile domain of life that must be urgently protected and cared for, both for its own stake and ours. 'Man' too is no longer the Subject of the world and the indisputable master of nature, but a cautious, sensible and responsible steward. He has been drastically reduced in size and now emerges as the 'human being', a being among other beings in the world and dependent on nature for his every need and very survival. As for those 'men' who were once thought to be 'savage' and 'backward' and in need of enlightenment, they too emerge in a different light…..They have been transformed into those who will 'enlighten' the world with this forgotten wisdom [respect for nature and living within limits] and can therefore be called, without the risk of misunderstanding, 'indigenous and traditional peoples' (Argyrou, 2005: vii-viii).

This study is an attempt to explore the same concepts with respect to the Ajoy River basin region. It takes the river, its characteristics and the people who live by its banks as a composite whole which manifests itself as the social landscape of the place. This research follows the approach suggested by Argyrou:

> I propose to treat it [environment] as part of that difficult, dense and ambiguous middle ground that constitutes the realm of culture …Having emerged in specific social contexts, facts circulate and become the object of belief as much as of disbelief, discussion and debate, truths to be upheld or fictions to be rejected (Ibid: ix).

1.3 Rationale of the Study

This study aims at presenting a holistic picture of the social landscape in

the Ajoy basin region in Birbhum District in West Bengal state in India. I seek to explore different dimensions of the landscape centering on the river and ascertain to what extent these dimensional differences give rise to contending realities. This study, as a result, seeks to explore the present state of the social landscape of this region, and how it is likely to change in the near future. India, the second largest nation on the planet in terms of population, was a primarily rural country only a few years back. But since the economic liberalization drive in the 1990s, the country has seen the cities boom and the traditionally rural India is giving way to a more urbanized country every day. India is a land of rivers, but paradoxically, it is a water stressed country (Vira et al., 2005). Of late water has emerged as a critical resource in the international arena. Within India too, it has become the bone of contention between many states. A fuller understanding of the social context involving the various stakeholders in water will be helpful in gaining further insight into how societies traditionally dependent on river water will fare in the coming days. At the same time, the study aims to provide an analysis of how the social landscape in a given place is changing due to pressures of an urbanizing world. This, of course, is a part of a global process. As Handley et al. (2007) say:

> Today, for the first time in human history, more than half the world's population lives in towns and cities rather than in the countryside…..The modern city drawn those resources from around the world and requires a huge notional land area to assimilate its waste products; it has a very large ecological footprint (Handley et al., 2007: 167).

As the Ajoy is one of the main tributaries of the Ganga, the transformation in the social landscape is indicative of what may happen to the longest river flowing within India's borders in the coming years. Thus the significance of this study extends beyond its current scope of the 30 kilometer long stretch of River Ajoy near Bolpur and lies in the fact that river basin societies are complex and dynamic entities and a fuller understanding of them is needed to manage our threatened freshwater resources and cultural diversities that are steadily on the wane.

1.4 Research Objectives:

The objectives of this study are:

1. To assess the change and continuity in the social landscape of the area that is currently undergoing a rapid transition from a predominantly rural area to an urban one.
2. To explore how people perceive changes in the physical nature of the river itself and how they relate to the river and the surrounding landscape as a

result of changes within the societies that dwell within the landscape.

3. To explore how changes in the natural and social landscapes in the region are associated with trends like urbanization and globalization and how these trends are experienced at the level of the river bank dwellers.

1.5 Research Questions

1. What is the relationship between the river Ajoy and the bank dwellers, and how does the river figure in their lives?
2. How do the bank dwellers perceive the river in their daily lives today?
3. How do the bank dwellers perceive the man made changes in the river regime and to what extent are they involved in the same?

1.6 Methodology

The research methodology for this study is qualitative. Little research has been done on the Ajoy River and its social dimensions despite its famed presence in the local folklore. There have been some studies of its water quality by some local Nongovernmental Organizations (NGOs) and by local scholars in geography and environment. Issues covered have been loaded in favor of the

phenomenon of floods. Some assessments have been attempted of the sociocultural impacts of floods, but as we shall see, many of them have been quite sketchy. Thus an accessible database with firm quantitative indicators is nearly absent in case of the Ajoy river basin. A qualitative study is particularly suited where different variables are obscure and the aim is to ask questions and seek explanations rather than attempting specific causal correlations. I felt that this approach is the best one for this study, as it attempts to lay down some markers for future research work on this area, by exploring the social landscape in the Ajoy river basin region in an open ended manner.

The research was carried out through in depth interviews of residents of villages situated right beside the river, students in local colleges and the only university in the locality, and state government officials. Content analysis of local publications on the river and the bank dwelling village societies has also been carried out, and the transformation in the natural and social landscapes has been analyzed using photographs taken during the fieldwork trip from 2 to 29 August 2008.

The compatibility of the qualitative mode of research with the aims of this study is further elaborated below:

1. As qualitative research emphasizes on the concept of *emergence*, it is best suited for this study. Theory or hypotheses in qualitative research are not established *a priori*; rather, patterns, hypotheses and theoretical observations *emerge* from the data. Creswell (2003) observes: “Qualitative research is emergent rather than tightly prefigured” (Creswell, 2003: 181).
2. In qualitative research, the researcher is the main instrument. This is a stark contrast to quantitative research where statistical tools are available. This is true for both the data collection and data analysis phases.
3. In qualitative research, the subjects are observed in their natural settings. In this study, I interview bank dwellers in their villages, state government officials in their offices, and other people in the field.
4. Creswell (2003) observes that qualitative research attempts to give a holistic picture and present a panoramic view rather than a micro analysis (Creswell, 2003: 182). This research aims to explore the contours of the social landscape in the Ajoy River basin region near the township of Bolpur. Interpretation of the data to present a broad and panoramic framework is the central goal of this research.

5. The data collected will be analyzed for themes and categories, which again is seen as a fundamental characteristic of qualitative research (Ibid: 182). Creswell mentions six steps of qualitative data analysis and interpretation: organization of the data, making sense of the data, coding the data, describing the data, representing the data in the narrative, and interpreting the meaning of the data (Ibid: 194).
6. Coding of qualitative data is carried out to identify similar pieces of information and separating those that are different. It is similar to a process of organizing the material into chunks (Rossman & Rallis, 1998: 171). This research will identify matching themes from the three rounds of interviewing, and clarify the different perspectives, thereby gathering a sense of the different facets involved in the issue at hand.
7. This research is a mainly data driven one, and themes and categories will emerge from the data which has been gathered. In this way, it follows the pattern of *inductive analysis,* which means: "…*[D]iscovering* patterns, themes, and categories in one's data." [Italics original]. (Patton, 2002, 453). This research does not start with a specific hypothesis to test. Instead, it aims to

explore through observation, interaction and reflection, and matching thematic concepts with theoretical ones from secondary data sources.

8. As Janesick (2000) observes, interpretation is the crucial backbone of qualitative research (Janesick, 2000). Creswell (2003) also observes: "Qualitative research is fundamentally interpretive." (Creswell, 2003: 182). Patton (2002) elaborates on the centrality of interpretation by saying: "Qualitative interpretation begins with elucidating meanings…..the analyst works back and forth between the data and story (the evidence) and his or her own perspective and understandings to make sense of the evidence. Both the evidence and the perspective brought to bear on the evidence need to be elucidated in this choreography in searching of meaning" (Patton, 2002: 478). Qualitative interpretation is broad in scope as well as deep in substance. Patton further suggests that, "Interpretation means attaching significance to what was found, making sense of findings, offering explanations, drawing conclusions, making inferences, considering meanings, and otherwise imposing order on an unruly but surely patterned world" (Ibid, 480). This research sets out with the same objective, to analyze and interpret responses of

people and match them with the perspective of the researcher, in a quest to understand the social and political changes in the world around us.

9. As further pointed out by Creswell (2003), the researcher in qualitative research "…filters the data through a personal lens that is situated in a specific sociopolitical and historical moment." (Creswell, 2002: 182). This study is to be interpreted through my personal experiences as well. I was born and educated in Santiniketan, the seat of a central university in India adjacent to the township of Bolpur and thus situated practically next to the Ajoy River. I have seen the river from my childhood and am also familiar with the lifestyle of the villages located in the riverbank. However, I have seen the river as an outside observer, as the basin region is not my 'lived space.' Through this research, I aspire to utilize the theoretical concepts that I have come to learn in my student years so far, in order to get a fuller understanding of the issues that I have felt at a personal level at times in the past. I am deeply interested in delving into issues like cultural identity, transformation and sociopolitical change. This research, for me, is also a personal quest to understand the patterns in society and polities better.

10. This research is based on multi-faceted, complex and iterative reasoning; also seen as hallmarks of qualitative research (Creswell, 2003: 182). In qualitative data analysis, a single piece of data can have multiple meanings and significances. While analyzing interview results from villagers and different stakeholders, this research will encounter a huge number of different themes and threads, subtle differences and nuances which then will be analyzed to come to multifaceted conclusions, seen as a strength in the methodology of recursive sociology.

1.7 Scope of Research

This thesis will primarily look at the perceptions of the river and river-basin environment among those who dwell there. River basin ecosystems are complex and can be analyzed from many angles. This research is not going to look at the issues related to the geomorphic character of the river itself, or issues related to water quality, or issues related to biodiversity in the region. The issue of floods figures prominently in the study as the river in question floods frequently and as the communities living by its banks lead a ‘primitive’ life compared to our usual urban standards; they are affected by the rising waters in a very direct

manner and flood is an issue vitally linked to their existence. However, this research does not aim to analyze the physical aspects of flooding, how it happens and specific mechanisms governing its behavior in the rainy season in India. Flooding is seen here as a social reality, a phenomenon that shapes the society on the banks of the River Ajoy and is shaped by the society in turn, in a way pretty much akin to the river itself. In addition, flooding has an existence in the mindscape of the people dwelling by the river, and it is a constant presence in their conversations even when it is not actually taking place. This has led to different versions of the same incident among different people and as a result, they envision flooding and countermeasures to escape its fury in very different ways. This research tries to analyze why people have come to possess different perceptions of the same reality, to what extent their experiences and social positions color those views, and whether reality itself is a social construct at the level of perception.

1.8 Unit of Analysis and Sampling Method

For the surveys, the unit of analysis is the individual. Primary data was collected from interviewing villagers in the villages located on the banks of the

River Ajoy, and from different residents and stakeholders within the given landscape.

The sampling method followed was purposive sampling. The Ajoy River is very close to the place where I spent my life prior to coming to Japan, and the region is thus quite familiar to me. Some of my acquaintances and friends live in the adjacent areas. The villages are chosen with their accessibility and distance from the river in mind. The region covered in this research has a rough length of 30 kilometers along the river in the Bolpur subdivision of Birbhum District. Most of the chosen villages are right beside the river and typically small in size.

1.9 Data Sources

1.9.1 Primary Data Sources: The sources of primary data for this research are as follows:

a. Field notes of the interviews. These include the responses of the respondents and notes based on my own observation.
b. Reflective Field Notes. These are notes taken outside the main survey work, often while transcribing the survey data or the primary field notes.
c. Photographs. Color photographs in the field were taken with an Olympus

E 410 Digital Single Lens Reflex (DSLR) camera.

1.9.2 Secondary Data Sources: These data sources can be divided into two sections:

1. This section comprises literature produced on the river in the region in question. These are published and unpublished materials authored by local scholars and researchers. These include:

a. A booklet on the physical aspects of the river based on a survey by a local NGO, *Akhil Bharat Bhuvidya O Paribesh Samiti*.

b. A compilation of papers on local rivers and floods published by the Visva Bharati University, the preeminent university in the region concerned.

c. An unpublished thesis written as part of the Master of Arts curriculum in the Department of Geography in the Institute of Humanities and Social Sciences in Visva Bharati University in 2004 by Shamik Chakraborty.

d. Newspaper and magazine reports regarding water pollution and floods in India.

2. This section comprises of the literature on broader themes like social landscapes, the state of the environment in India and the man-nature relationship. These are the sources of the major theoretical concepts used in this study. They include books and journals published by both Indian and international scholars in

disciplines like Landscape Studies, Sociology, Environmental Science and Geography and some very influential cross disciplinary works.

1.10 Limitations of the Study

Constraints of time and finance were two major limiting factors as far as data collection is concerned. The qualitative researcher needs to go time and again to the field, and spend time with his or her subjects. But as this research study was undertaken for the completion of a Master degree, I faced constraints of both time and finance. I bore the expenses of the fieldwork entirely on my own, and therefore only a one-time fieldwork was feasible. I spent roughly a month in the field, from 2 August to 29 August 2008. During the fieldwork, I mainly concentrated on interviews of small and medium sized villages along a 30 kilometer long stretch of the river near Bolpur town. This area is located in the downstream section of the river and is frequently affected by floods. I also talked twice with the in-charge of the oldest water monitoring station by the river, which is located nearby. My other informants were local residents of Bolpur and the nearby township of Santiniketan, and students comprised a majority of these informants. In India, it is difficult to get data from government offices, and in

many cases, the officials are reluctant to cooperate with the researcher, unless they are familiar with him or her. In many other cases, the documents simply cannot be retrieved within a short time span. Prolonged presence in the field would have been more beneficial in the sense that I could have gathered more data but the requirements of the Masters program in Ritsumeikan APU and my financial constraints did not allow me to stay in the field for a prolonged period of time.

While my research has the above mentioned limitations, I am heartened by what Patton observes: “Perfectionism breeds imperfections. Often additional fieldwork isn’t possible, so gaps and unresolved ambiguities are noted as part of the final report.” (Patton, 2002: 437). I hope that I shall be able to explore the issues to an even greater depth in my PhD level research in the future.

CHAPTER 2: THE CONCEPT OF SOCIAL LANDSCAPE

> …[T]he landscape idea represents a way of seeing…Landscape is a way of seeing that has its own history, but a history that can be understood only as a part of a wider history of economy and society; that has its own assumptions and consequences, but assumptions and consequences whose origins and complications extend well beyond the use and perception of land; that has its own techniques of expression, but techniques which it shares with other areas of cultural practice (Cosgrove, 1998: 1).

2.1 Some Meta-narratives on Man and (His?) Landscape

The most common perception associated with the word *landscape* is perhaps a view or a vista. Scholars like Spirn observe the word *landscape* joins the word *land* with a suffix derived from *schaffen* or *skabe* i.e. *to shape* (Spirn,1998: 16). Thus, a landscape is not static but a dynamic entity, one that changes constantly with time, through the influence of both spatial and temporal factors. Some processes that change the shape of a given piece of land are of geomorphic origin, like wind, water and heat. However, this thesis is not concerned with the dynamic intricacies of such processes; in other words, it will not deal with *how* a given piece of land changes under their influence. Instead, this thesis will look at another agent of change, man. Man is a member of the huge family of organisms that this planet possesses and despite our great success

story as a species, may not be the most influential species to have left its mark on its habitat. All animals, plants and other life forms change their habitats. The word ‘change’ here does not solely imply a ‘movement away from the original state’ but also incorporates the dynamic equilibrium of a system, which is achieved by constant transformation and alteration in and among the systemic components, by agents from within, outside, or a combination of both. In other words, life-forms changing a given landscape are a part of what gives it its identity. Man, then, is a mere agent of such a grand design of nature.

However, our historians and scholars have most often seen the footprints of our species in a manner that gives disproportionate weight to our own role, or in other words, we often tend to overestimate our roles in landscape formation. Even a noted scholar like Jackson (1984) has observed:

> Nevertheless the formula *landscape as a composition of man-made spaces on the land* is more significant than it first appears, for it does not provide us with a definition it [sic] throws a revealing light on the concept. For it says that a landscape is not a natural feature of the environment but a *synthetic* space, a man-made system of spaces superimposed on the face of the land, functioning and evolving not according to natural laws but to serve a community---for the collective character of the landscape is one thing that all generations and all points of view have agreed upon. A landscape is thus a space deliberately created to speed up or slow down the

> process of nature. As Eliade expresses it, it represents man taking upon himself the role of time. (Jackson, 1984: 7-8) [Emphases original]

Such a view is in sharp contrast to those taken by scholars like Diamond, who suggests that man is a part of nature, and the man-nature duality is an artificial concept. In fact, Diamond (2005) has argued that geography has been the main motive force behind certain societies in certain times in history, who have managed to vanquish others and proclaim the superiority of their races (Diamond, 2005). In fact, man has been heavily dependent on wild species available for domestication, climatic factors allowing certain crops to grow, and ultimately on the geographical location of the place when he has been successful (Ibid: 87).

Nonetheless, man, as a species, has innovated and evolved and has had a huge impact on the flora and fauna of the lands that he has inhabited. Diamond has indicated a possible strong connection between mass extinction of the Australian megafauna and the peopling of the land:

> "Personally, I can't fathom why Australia's giants would have survived innumerable draughts in their tens of millions of years of Australian history, and then have chosen to drop dead at least simultaneously (at least on a time scale of millions of years) precisely and just coincidentally when the first humans arrived. …They became extinct in every habitat without exception, from deserts to cold rain forest and tropical rain

> forest. Hence it seems to me most likely that the giants were indeed exterminated by humans, both directly (by being killed for food) and indirectly (as the result of fires and habitat modification caused by humans). (Diamond, 2005: 43-44)

Thus, the spread of our species has had a profound impact over the planet that we find ourselves to be in, and has had a profound impact on the landscapes across continents. Indeed, today we can see man everywhere on this planet. There is scarcely a corner left in this earth which has not been inhabited or frequented by our species. Such a proliferation of a species that has had such a profound impact on ecosystems and the native flora and fauna of the lands it has spread to, and the consequent voracious consumption of natural resources by that single species, have been a double-edged sword. On the one hand it has allowed man to inhabit even inhospitable places and tame hostile terrains, thus helping him acquire vast amounts of resources. On the other hand, it has left him vulnerable as the resources that he has used up were finite and in the absence of the same resources in future, his own future looks to be in serious jeopardy. Such thoughts have been the cornerstone of the concept of ‘overshoot’ (Meadows et al., 2005). The causes of a system undergoing ‘overshoot’ and consequently becoming unstable can be manifold. A vital cause of overshoot, increasingly given weight to by

environmentalists, is the carrying capacity of a system, or the inherent limitations of the same:

> The three causes of overshoot are always the same, at any scale from personal and planetary. First, there is growth, acceleration, rapid change. Second, there is some form of limit or barrier, beyond which the moving system may not safely go. Third, there is a delay or mistake in the perceptions and the responses that strive to keep the system within its limits….The limits are similarly diverse---they may be imposed by a fixed amount of space; by limited time; by constraints inherent in physical, biological, political, psychological, or other features of a system. (Meadows et al., 2005: 1-2)

It can be observed that the concept of 'overshoot' is an apt summation of man's impact on ecosystems across the planet, and impact that has serious repercussions as far as the survival of countless wild plant and animal species are concerned and no less serious effect on the survival of man himself.

Thus, the whole debate of the man-nature duality (with one having a say on the other) and the man-nature complimentarity (with one being integrally attached to the other), is a debate over two 'visions' of man's place on this planet and the nature of what we call 'nature'. Though these views clash at times, they also overlap and complement one another, and each is a valid way to proceed with the inquiries of the human mind.

2.2 Perspectives in Landscape

A landscape is not merely something that is 'out there' but it gets its identity from processes 'in' the human societies that dwell in that tract of land and that frequent it as visitors or as mere observers from afar. This is a symbiotic relationship with the landscape, since its inhabitants and observers have given it its present identity and the physical properties of that landscape have influenced its modes of interaction with humans. Zukin (1991) has summed this relationship up in the following manner:

> "Neither solely 'protectionist' not merely 'local', space is structured by, and structures, circuits of capital that incorporate real estate development, amenities and services, and visual consumption." (Zukin, 1991: 266).

And,

> " …space also structures people's perceptions, interactions, and sense of well being or despair, belonging or alienation. This structuring quality is most clearly felt (and most visible) in the built environment, where people can erect homes, react to architectural forms, and create-----or destroy-----landmarks of individual and collective meaning." (Ibid: 268)

Aitchison (2000) has also explored the nature of man's perspectives inscribed in his view of a landscape in the following manner:

> "…far from being a 'natural' relationship, the affinity that

> humans have for landscape is predominantly a (by)-product of the imagination, shaped by a variety of social and cultural constructs." (Aitchison, 2000: 77).

She quotes Urry (1995) to show that even man's perception about 'nature' is a social construct, shaped by the constraints of his society and the inherent bias at looking at things that comes from being a member of the family of creatures on this planet:

> "Urry suggests that people have interacted with this construct called 'nature' in various ways throughout history, from stewardship of land, to exploitation, to scientisation, culminating in visual consumption: the contemporary mode of interaction." (Urry, 1995: 174. In Aitchison, 2000: 77).

However, the notion of landscape, though a social product, is not static. It evolves with time and changes within human society, as perceptions of the changing role of human society in a changing planet also change.

It is easy to see that if *landscape* itself is a social construct, then there must be many different and contending perspectives about the same physical space because many dissimilar social modes coexist within that space. However, as is true with any chapter in human history, not all perspectives are incorporated within the 'standard view'. This is simply because different perspectives have different degrees of power associated with them: in other words, some are more 'powerful' than others. These powerful perspectives in turn become the

standardized views of nature and society in a given period of time, till changes brought forth by time and natural constraints sweep away that standardized view and replace it with another. Cosgrove has summed this up in the following manner:

> "Landscape, I shall argue, is an ideological concept. It represents a way in which certain classes of people have signified themselves and their world through their imagined relationship with nature, and through which they have underlined and communicated their own social rule and that of others with respect to external nature." (Cosgrove, 1998: 15)

Thus, in different ages, different perspectives of landscape have held sway. Today, the mantra is a synthesis of the differing views, a 'holistic' account incorporating as many viewpoints as possible. However, it still is an ideological concept, for rarely do conflicting viewpoints coexist in the real world in a harmonious whole. It is worth observing that the need for a 'holistic' account is borne out of the situation in the world around us today, where humanity's relentless expansion has imperiled ecosystems and exterminated many species which were familiar even a few generations ago, and where global warming, rising sea levels and increasingly severe storms are seen as the results of human activities.

The two perspectives that give rise to the idea of the landscape, and are

apparently in fundamental opposition, are the perspectives of the ‘observers’ of the landscape on the one hand, and the ‘inhabitants’ of the landscape on the other. Throughout much of human history, the standard view of the landscape has been loaded in favor of the observer.

> Throughout this history, the landscape idea was active within a process of undermining collective appropriation of nature for use. It was locked into an individualistic way of seeing which found technical expression in modes of visual composition directed to the distanced eye and which posited a human relationship with the land and nature based increasingly on exchange values. It is a way of seeing which separates subject and object, giving lordship to the eye of a single observer. (Cosgrove, 1998: 262)

However, in the modern world, the fallacy of such a vision has been recognized. The role that the inhabitants play in the formation of a landscape’s identity has been appreciated by scholars and their vision and perception of landscape has been validated:

> *Landscapes can be deceptive.*
>
> *Sometimes a landscape seems to be less a setting for the life of its inhabitants than a curtain behind which their struggles, achievements and accidents take place. For those who, with the inhabitants, are behind the curtains, landmarks are no longer geographic but also biographical and personal.* (Berger, 1976: 13, 15) (In Cosgrove, 1998: 271. Emphasis and citation style as per original text)

It is the aim of this thesis to throw light on the perspectives of the people who reside in the Ajoy river basin near Bolpur. These perspectives, the accounts of the 'inhabitants' of the landscape are learnt and represented through the explorations of an 'observer', here the researcher. It is thus in an attempt to achieve a synthesis of both 'subjective' and 'objective' accounts of the landscape that this work finds its origin.

2.3 Changing the 'Natural' Landscape

Today, the presence of us human beings has become pervasive in all ecosystems. As discussed earlier, man can be either seen as part and parcel of 'nature' or as an agent acting on 'nature'. It is questionable whether we can find any landscape still in its pristine natural form, without the influence of man, apart from the icy continent of Antarctica. Man has inhabited, altered and engineered most other landscapes. Accordingly, many branches of human knowledge have tried to address the various issues involved:

> Where human beings are active agents in ecosystems, then the field of study is sometimes called human ecology and the resulting systems have been given a variety of labels such as anthroposystems, socionatural systems and, in a more specialized case, agroecosystems. (Simmons, 1996: 11).

The concept followed is that of a man-nature duality, which, Simmons points out, forms the very basis of Western scientific tradition (Ibid: 11). Such a dualistic vision necessitates the separation of an ecosystem and its human components in order to measure the degree of human impact upon the ecosystem:

> To help our discussions of the impact of the human societies upon nature, we need to be able to characterize an area of natural landscape and its processes, and then within the same conceptual frame detail the impact upon it of human activities and how our societies have continued to live within the new system thus created. (Ibid: 12)

The man-nature duality is a convenient tool for measuring the impact our species has had upon the earth that is much older than we are. In other words, take any landscape, and it has many components which were formed long before man appeared on the evolutionary scene, and may even house living components who arrived on earth much earlier than *Homo sapiens*. However, the state the landscape is in today, and the state that its other living components find themselves to be in, are all more or less shaped by the activities of one species, man. Simmons describes it in the following manner:

> While it is convenient to think of humans as components of ecosystems, there can be no doubt that they differ from other organisms in their power to manipulate many of the other components of the system. For a start, human activity has created genotypes in both plants and animals

> by the processes substituting human for natural selection, and we have created new ecosystems by a variety of processes. (Ibid: 30)

Human impact on landscapes, then, has given rise to new landscape forms, and altered the conditions for the abiotic and biotic components. Some of the changes came about as a result of human interaction with nature where the outcomes were not foreseen by the agents, while some other changes were deliberate, designed by man to engineer specific outcomes.

> We have established beyond doubt that human societies have altered their biophysical environments since very early times, even if we cannot assign a precise beginning to the process. From the start, the metamorphoses were of tow kinds: those which were deliberate and those which were accidental. Sometimes, no doubt, the two have been virtually indistinguishable…. (Ibid: 403)

However, the decoupling of man and nature scarcely reduces the enormous complexities inherent in the system. We can say that the landscape is the visual manifestation of a complex web of interactions between ecosystemic components, many of which are invisible to the human eye, and many of which are still unknown to the human mind. Nevertheless, human beings have a decisive impact upon the landscape in the sense that they alter many of its components and physical characteristics. What human induced changes can do, in effect, transcends the limitations set by human agents, for many parts of the complex

web of interactions and dynamic synergies between physical, biotic and other components of a given landscape are poorly understood. Thus, human activities upon the face of the earth give rise to an enormously complex process, which can affect the system in a manner that is still not properly understood. The complexity of the system and its evolution as a result of the impact of man can be seen as akin to Lovelock's (1979) ideas about natural systems housing living beings, i.e. these systems evolve with, by, and for their inhabitants. However, this evolution happens in a manner that it cannot be analyzed neatly. As Simmons argues:

> Possibly the greatest worry about many of the possible synergisms is what is usually called the 'jump effect.' This encapsulates the idea that the interaction of a number of variables (which can be both natural and cultural) does not proceed by a simple linear fashion from A to B, but rather changes little for a long time and then suddenly jumps from A to B at an unpredictable time and with an amplitude of fluctuation that is unforeseen except in the broadest of terms. (Simmons, 1996: 416).

And

> …no system is safe from unpredictable change from chaotic and synergistic interactions. (Ibid: 422)

With these many components involved, and these many interpretations of the interaction between man and nature and the evolution of the whole system, it is useful to ask, what is the nature of this interaction, what effect does this have on the other component and features of a given landscape? There is no simple

answer to this question. In many instances, human alteration of landscapes has created verdant green patches in arid zones and allowed crop varieties to flourish, while in some other instances it has led to the disappearance of exotic animals and plants from the face of the earth, as discussed earlier. The nature of human interaction with physical and biotic systems can best be summarized as dual in nature, as having both a benevolent and a malevolent side.

> After all, transformation of the earth's surface seems to be one of the inevitable concomitants of human societies down the millennia….we should therefore be concerned that such metamorphoses ought to be creative rather than destructive. Yet there seems a persuasive case that no alterations ought to be total. (Ibid: 425)

As the landscape is taken as the visual manifestation of the complex web of existences and processes that goes by the name of an ecosystem, it can be observed that such effects bear upon the ecosystem as well, thereby altering it and making it evolve in ways that are poorly understood, even at present.

2.4 Human Landscapes

Scholars of humanistic geography see the landscape as an integrated whole. They see its existence vitally linked with identity created by the groups resident in the landscape, who see it as their 'lived' space, and with visual consumption by

tourists and outside observers, who view the landscape from outside. The recent trend is a holistic appraisal of the landscape, and hence the incorporation of both insider and outsider views for a fuller understanding. Denis Cosgrove (1998) points out that by introducing the human imprint upon the face of the earth, John Brinkerhoff Jackson has given the landscape a humanistic flavor, which is often missing in ecological appraisals of the same:

> Of landscape as a formal term Jackson has admitted that 'the concept continues to elude me', and gives the reason as his refusal to treat it as a scenic or ecological entity and his determination to accept it as a political or cultural phenomenon, changing in the course of its history….landscape is anchored in *human life,* not something to look at but to live in, and to live in socially. Landscape is a *unity* of people and environment which opposes in its reality the false dichotomy of man and nature which Jackson regards as a Victorian aberration. Landscape is to be judged as *a place for living and working* in terms of those who actually do live and work there. All landscapes are *symbolic,* they express 'a persistent desire to make the earth over in the image of some heaven, and they undergo *change* because they are expressions of society, itself making history through time. (Cosgrove, 1998: 35)

Thus landscapes are social and cultural products. They can be fully understood by analyzing the sociocultural life of the inhabitants who 'make' that landscape. They cannot be understood by only the 'forms' that they present to the observer's eye, they have to be analyzed from the angle of the 'processes' that give rise to those 'forms' and by analyzing the actors who engage in the 'processes.'

Cosgrove goes on to add:

> The treatment of landscape in humanistic geography, despite its shortcomings, demonstrates that the issues raised by landscape and its meanings point to the heart of social and historical theory: issues of individual and collective action, of objective and subjective knowing, of idealist and materialist explanation. If traditional geographical studies of landscape stressed the outsider's view and concentrated on the morphology of external forms, recent geographical humanism seeks to reverse this by establishing the identity and the experience of the insider. (Ibid: 38)

It is this approach that this research also tries to employ while exploring the changes in the landscape of the Ajoy river basin region. This requires the researcher to learn from the experiences of the people inhabiting the landscape and to identify the social processes which become the causal factors behind the change and metamorphosis of this landscape. This process is open ended, and the research does not seek to prove or disprove a hypothesis that arises from a particular theoretical framework. On the contrary, this research tries to learn from repeated observations, from stories told by the local subjects, and by tapping the reservoir of historical memory of that same landscape in people who are associated with it in different capacities. It tries to indicate a pattern behind the changes manifested at the visual or interactional levels, or even unearth some juxtaposition of different patterns in the manifestation of these changes. The

researcher here assumes the role of the outside observer of the landscape; his view of it, though mixed with his own experiences as a child who grew up to be a man near the region in question, nevertheless, is removed from the day to day realities of the landscape. Though I myself was born and brought up in a town not far from the river, my experiences of it came through the eyes of a casual tourist in my childhood and subsequent adult years, and then, for the second time, through a temporary visit to the land with this research work in mind, which finds its roots in sociological and environmental discourses. Thus, the researcher adopts a stance of a careful observer, open minded and ready to incorporate views of others, but staying an 'observer' till the end, for in his quest to analyze the phenomena of continuity and transition in the given landscape, he imparts the notion of 'objectively judging' the landscape from the point of view of 'others'. In contrast, the views the subjects present make no conscious effort to see the reality 'objectively' or, as removed from the experiences that generated them in the first place.

By combining the subjective and objective views, the researcher aims at building a conceptual framework which can account for the causal factors behind what he observes and what his subjects say they do. This approach, thus closely

follows the three steps of ‘grounded theory’ that Strauss and Corbin (1998) specify:

> *Description*: The use of words to convey a mental image of an event, a piece of scenery, a scene, an experience, an emotion, or a sensation; the account related from the perspective of the person doing the depicting
>
> *Conceptual Ordering:* Organizing (and sometimes rating) of data according to a selective and specified set of properties and their dimensions
>
> *Theory:* A set of well-developed concepts related through statements of relationship, which together constitute and integrated framework that can be used to explain or predict phenomena
>
> (Strauss and Corbin, 1998: 15)

CHAPTER 3: THEORETICAL INSIGHTS ON NATURE, MAN, ECOSYSTEMIC CHANGE AND LANDSCAPE TRANSFORMATION IN THE CONTEXT OF THE PRESENT STUDY

The eternal mystery of the world is its intelligibility.
Albert Einstein[3]

3.1 In the Beginning: The Man-Nature Debate Revisited

This chapter seeks to throw light on some key issues that are being debated in scholarly circles in the context of this research and its aims. It is useful for situating the study in the context to which it belongs, and for charting out what kind of theoretical implications the findings of this study are likely to offer. Therefore, this chapter will pick up the threads from what we have discussed in the last chapter already, sometimes reemphasize them, and offer explanatory notes on the ideas we have explored previously in embryonic forms.

As observed earlier, there are conflicting yet at times complimentary views on the duality of man and nature. Logically, it is easy to see why the views are complimentary: both arguments describe the same world. However, there is an important issue which has been explored by the deep ecologists, and increasingly by the sociologists dealing with the various forms of this debate. It is that the birth of these two schools of thought is a social process and can be traced

back to specific socioeconomic changes in history. While discussing the birth of the dichotomy of man and nature from primitive beliefs which were almost always animistic, Jelinsky (2005) says:

> Etymologically, nature derives the Latin *natura* meaning "to be born from." Hence Nature began as an adjective describing "the essential quality or character *of* something" and evolved into (i) a force that directs either the world and (or) humans, and (ii) the material world, which may or may not include humans. (Jelinsky, 2005: 274)

Thus, in the beginning, nature was a whole and the concept was a harmonization of two dualistic components. This could be the case while man was at the mercy of nature, identified himself with the natural forces, sought to understand them, and revered the power inherent in those forces. But as our species became more and more dominant, we started seeing nature as something that can be *cultivated* for our own ends, and herein, according to Jelinsky, lies the birth of *culture.* In Europe it was the Renaissance thought, the new logical precision of science, that was the harbinger of this duality. Jelinsky locates the cutoff point in this specific period of European history where the knowledge of physical science came to be seen as the backbone of society and, in the era that followed, led to the industrial revolution. He invokes the Cartesian system in science to say that it was this system, embedded in specific sociopolitical and socioeconomic changes in

Europe at that time, that led to the emergence of this duality:

> Cartesian dualism contains a basic dichotomy between *nature* and *culture*. The Cartesian dichotomy is founded on Aristolean logic that everything must be classifiable as one thing *or* another….and a thing cannot be both one *and* another….(Ibid: 275)

This fragmentation of the identity that was made up of two dualistic parts led to tendencies that flowed in quite opposite directions. On the one hand came the drive to colonize nature and its resources, which emerged in the form of political and economic colonization of different parts of the globe by major European powers, and eventually culminated in them fighting the bloodiest wars in the history of our species. After two devastating wars in the twentieth century, the world saw a decisive power shift in the political and economic spheres, with the demise of European colonization, the rise and fall of Communism in Russia, the emergence of the United States as the sole superpower after the disintegration of the Soviet bloc, the remarkable rise of some Asian nations and globalization of politics and finance, but the drive to colonize natural resources is still seen in many parts of the globe, though the corollaries of political and economic domination have been replaced by the concept of controlling from afar.

3.2 The Implications of Globalization

The new world order that arose from the ashes of the last World War and evolved gradually in the later years of the twentieth century is usually termed the era of globalization. Here, we can see again that this era is rooted in specific sociopolitical and socioeconomic changes in the society (Held, 2004, Kaplinsky, 2005). A vital difference is that the theatre of these changes is no longer Europe, or North America, but regions in all parts of the globe. Thus, this change is therefore sudden and shocking for many parts of the world which have not yet fully gone through the earlier phases.

Thus, we can say that the process of globalization has led to both the emergence of problems in the man-nature system and the state of the earth and also consciousness about those problems. Indeed, on the one hand, many of the problems like global warming or the loss of rainforests across the planet can be traced back to the days of the Industrial Revolution and can be shown as having remarkably escalated since the globalization process began; while on the other hand, there are numerous instances of regional disparities in behavior towards nature coming to light and the man-nature system being reappraised as a result of the same process. What has become popular of late is a holistic model of the

man-nature system, where the earth is seen as a living organism (Lovelock, 2000). At the same time, there is a demand for much more radical solutions to the environmental problems by radical ecologists who see a fundamental problem in the ongoing process of resource acquisition, and instead stress resource conservation and resource regeneration. Radical environmentalists believe technological fixes will not be enough to solve the pressing problems that afflict the global environment today. They argue for a sweeping change in the values and worldview of the politicians and society. Radical environmentalism is also deeply critical of anthropocentric approaches. It also criticizes the Renaissance scientific tradition as one which replaced the sanctity of natural systems as whole units with the notion that the cosmos can be analyzed in its constituent parts and therefore gave rise to the idea of a clockwork universe. This, the radical environmentalists argue, led directly to the idea that nature can be conquered and men can govern nature and exploit it for their own needs through a mastery of natural laws. The radical environmentalists are seen as supportive of notions like chaos or quantum physics which strike a blow at the heart of deterministic physical science (Sutton, 2000).

3.3 Cities and Markets in a Globalized World: Prime Agents of Landscape Transformation

When we come to more concrete issues in recent ecological, globalization, and urbanization debates, we see similar themes that have their source in the changing worldview which results from the process whereby different locational points have come temporally closer. Interaction between them has been immensely speeded up, so that processes at one particular point are felt almost simultaneously at many other points. This, in a nutshell, is what globalization is. As noted earlier, the idea that the idea of place itself has undergone a fundamental change as a result of globalization has been explored by authors like Zukin (1991). As Scott (1997) observes in the same vein:

> Place and culture are persistently intertwined with one another, for place….is always a locus of dense human interrelationships (out of which culture in part grows), and culture is a phenomenon that tends to have intensely space-specific characteristics thereby helping to differentiate places from one another. The point is sharply underlined by the work of cultural critics, urbanists and historians like Clark (1984), Davis (1990), Dimaggio (1982), Schorske (1980) and Zukin (1991; 1995) among many others.
>
> As we enter the twenty-first century, however, a deepening tension is evident between culture as something that is narrowly place-bound, and culture as a pattern of non-place globalized occurrences and experiences (Appadurai, 1990; Morley and Robins, 1995; Peet, 1982; 1986; Webber, 1964). Thus, on the one hand, and even in a world

> where the ease and rapidity of communication have become watchwords, place is uncontestably a repository of distinctive cultures. On the other hand, certain privileged places represent points from which cultural artifacts and images are broadcast across the world and this same process has deeply erosive or at least transformative effects on many other local cultures. (Scott, 1997: 324)

What are these 'privileged spaces'? Scott here is looking at urban centers, which have grown immensely in influence with the global industrial economy, for they are the centers for transportation and communication, the two main hallmarks of the process:

> Cities have always played a privileged role as centers of cultural and economic activity. From their earliest origins, cities have exhibited a conspicuous capacity both to generate culture in the form of art, ideas, styles and attitudes, and to induce high levels of economic innovation and growth, though not always or necessarily simultaneously. As we enter the twenty-first century, a very marked convergence between the spheres of cultural and economic development seems to be occurring. This is also one of the distinguishing characteristics of contemporary urbanization process in general, as Molotch (1996) has suggested in a path-breaking paper on aesthetics, commerce and the city.
>
> These preliminary propositions are based on the notion that capitalism itself is moving into a phase in which the cultural forms and meanings of its outputs become critical if not dominating elements of productive strategy, and in which the realm of human culture as a whole is increasingly subject to commodification, i.e. supplied through profit-making institutions in decentralized markets. (Ibid: 323)

He concludes with the following remarks:

> As capitalism globalizes, moreover, the geographical specificity of the

> cultural economy of the cities becomes, if anything, yet more pronounced because……globalization enhances the possibilities of vertical disintegration, productive agglomeration and specialization (Scott, 1997: 327).

Similar ideas have been expressed by scholars like Vliet (2002) whose discussion of the city's role in landscape change is in much more direct terms:

> Although globalization certainly affects rural and peri-urban areas, global forces are centred in cities. It is in cities that global operations are centralized and where we can see most clearly the phenomena associated with their activities, whether it be changes in the structure of employment, the formation of powerful partnerships, the development of monumental real estate, the emergence of new forms of local governance, the effects of organized crime, the expansion of corruption, the fragmentation of informal networks or the spatial isolation and social exclusion of certain population groups.
>
> The characteristics of cities and their surrounding regions, in turn, help shape globalization, for example by providing a suitable labor force, making available the required physical and technological infrastructure, creating a stable and accommodating regulatory environment, offering the bundle of necessary support services, contributing financial incentives and possessing the institutional capacity without which globalization cannot occur. (Vliet, 2002: 33)

Thus from this discussion we may conclude that cities have a direct stake in the reformulation of landscapes. That role, in turn, is deeply associated with the trends in the global economy, which, in its quest to integrate all regions on the planet into its orbit, nevertheless, is still very divisive and acts in reality with a

piecemeal approach. This is because of the tendency of this global economic system to ‘centralize’ in urban centers. Global economic forces tend to prioritize anything that is urban in a landscape. Even though the spatial extension of that ‘urban’ zone can be small to start with, this area ends up becoming a ‘nerve-center’ as a result of being bolstered by geo-economic forces in their various local level manifestations. Soon, the urban center has an expanding and decisive effect on the surrounding rural and peri-urban landscapes.

A closely related theme is the emergence of global markets, whose centers coincide with the urban centers, even as their spheres of activity and influence reach far beyond, into peri-urban, rural, uninhabited and even uninhabitable landscapes. In discussing the importance of global markets in landscape transformation, Wilenius (1999) suggests that, in discussing the role the markets play in the transformation of a landscape, we need to appreciate the fact that the market itself may be located far away, in some distant city barely visible on the horizon from the rural landscape which it seeks to modify, or may not be present in any particular location at all. Nevertheless, it has immense power in transforming landscapes, especially when the state policies become a vehicle of the changes necessitated by market forces. He observes that, with the process of

industrial and global capital formation, markets themselves have undergone a change analogous to that experienced by the place:

> With capitalism, markets lost much of their local specificity. Today they have evolved into an abstract spatio-temporal principle guiding people in social interaction….They are no longer tied to a particular place. (Wilenius, 1999: 36)

This loss of the relevance of the local in the face of the expansion of the global has created environmental problems that are not localized because of the vehicles available to transport them to faraway places. In fact, often changes have been forced on the locality by a panoply of these geo-economic and geo-political factors, which have disenfranchised the local residents from having a say in controlling their lived spaces and surrounding environments. Wilenius sees the origin of these changes in the changing capacities of the nation states to act as sovereign entities in relation to the economy:

> Although the economy-based forces of globalization have considerably reduced internal and external power of nation-states….the emergence of international regimes based on nation-states has meant that the political order handed down by the legitimate governments of the states in question has been intensified, also in remote areas (Ibid: 36).

Quite importantly, as we have seen many times in issues related to landscape studies or geo-environmental change, Wilenius sees a dialectic in this process, as it becomes not only a problem that originates afar and has repercussions on

specific places, but as it is seen also as a problem that is generated by the place (now fundamentally modified, as we can observe from earlier references) itself and very much a part of the local environment. Here he sees the need of a conceptual model that can take care of this dialectic without becoming diffused in significance and advocates the 'Risk Society' model of Beck (1996) in this regard. He advocates this framework as having the following characteristics:

> ...a conceptual framework which allows us to grasp them [environmental problems] as problems not of the *environ*ment or surrounding world, but in the inner world of the society. In place of seemingly self evident concepts of 'nature', 'ecology' and 'environment', which have their ground in an opposition to the social, this framework starts beyond the dualism of society and nature. Its central themes and perspectives have to do with *fabricated uncertainty* within our civilization: risk, danger, side-effects, insurability, individualization, and globalization. (Beck, 1996: emphasis added).

Wilenius (1999: 37) also attacks the man-nature dualism as a source of confusion, and adopts a critical stance towards the Western scientific tradition, which, he implies, has not been up to the task of generating a worldview that can effectively address the problem of global environmental change manifested in the form of landscape transfiguration:

> …four factors of modernity are in many ways related to the escalation of environmental problems. First, although science and technology have generated material prosperity and thereby earned their social authority,

they can be shown to be an essential factor to growing risks of modernization.

Second, with the expansion of capitalist hegemony, natural resources even in remote areas have become commodified. With fewer institutional borders to restrain the activities of market actors, the monetary value of nature and natural resources obtained in global markets has become the major factor directing the use of natural resources…

Third, as Daniel Bell (1997) has pointed out, nation-states have in many instances proved to be too big to handle small environmental problems and too small to handle big ones. Especially in the Third World, where nation-states were established under the conditions of colonialism, the relatively high autonomy of local authorities have been wiped out in many regions by national authorities who have begun exploiting local natural resources by force. Constructions of large-scale dams, for instance, have proved in many cases to become a dystopia for the local people, as they have been forced to leave their homes…

Finally, for the individualization process, some environmentally detrimental implications can be suggested as well. ….the modern individual is not so much concerned with the essence or quality of natural phenomena as with their (measurable) functions. Consequently nature is valued not so much as an independent entity but as a natural resource for humans that must be conquered and exploited, rather than nurtured, sustained and collaborated with. (Ibid: 41-42)

3.4 Changes in River Regimes at the Hands of Man

Human societies have been sustained by rivers since a long time back in the past. Due to their long association with rivers, humans have extensively modified river regimes since prehistoric times. Though there has recently been much debate about the detrimental impact of humans on river systems, for

instance by building big dams, human interference in river regimes is not a recent phenomenon. People modify rivers and river basins for agricultural purposes. Nevertheless, it cannot be denied that today, most rivers in the world are influenced by human induced changes in one way or the other and the large construction projects like big dams on rivers are closely associated with urbanization in human society. Goudie (2000) points out quoting Mrowka (1974) that humans affect a natural river regime in various ways, and direct manipulation of the channel is the main form of interference in many cases. He further identifies dam and reservoir construction as the major forms of direct channel manipulation. Dams are capable of controlling the river in many ways, the main of them being their ability to hold water back from flowing along its natural course, thereby accentuating siltation in the channel downstream (Goudie 2000). Dams can induce flooding in an artificial manner as well:

> There are examples of rivers where,…floods carried away the sediment brought into the main stream by steep tributaries. Reduction of the peak discharge after the completion of the dam leaves some rivers unable to scour away the sediment that accumulates as large fans of sand or gravel below each tributary mouth (Dunne and Leopold, 1978). The bed of the main stream is raised, and if water intakes or other structures lie alongside the river they can be threatened again by flooding or channel shifting across the accumulating wedge of sediment. (Goudie, 2000: 210-211)

Besides these effects, an embankment constructed to protect river side localities from floods may also have a negative impact as it can prevent the flood water from flowing back into the main channel, thereby waterlogging vast sections of land. (Ibid: 215).

Thus, it becomes clear that human interference in the river regime actually comes with the aim of controlling the destructive aspects of the river, but it often becomes counterproductive as a river is a dynamic system, and often man's aspiration to control its dynamic nature makes it more destructive. Though dams can reduce the frequency of floods, they can generate artificial flood events or exacerbate a normal flood.

3.5 How about India? Situating the Present Study in the Global Environmental Change/ Landscape Transformation Debate

Our study area is situated in Asia. This is the world's most populous continent, and the seat of 'oriental' civilization. Do we expect to find the state of the environment to be qualitatively different here, due to a qualitative difference in the mode of human interaction with nature? The Asian mode of life has been predominantly agricultural for much of its history and well into the twentieth

century (with some notable exceptions like Japan). Asia is the continent where some of nature's biggest systems lie, due to the sheer size of the continental land mass and the proximity of the Pacific, the water body that covers nearly half of the planet. It has rivers running for thousands of kilometers, snow capped mountains towering into the sky, rainforests full of exotic animals, huge swathes of arid deserts that go without water for years, and gigantic plains that have been cultivated for thousands of years, to feed the hungry mouths of billions that inhabit this continent. It can be seen, that Asians have had a very direct relationship with nature due to a combination of all these factors. After all, where billions, until recently, were attached to farming for their everyday lives, it is quite natural that natural cycles and consciousness of man's integral links with nature will be felt more easily than in societies insulated from nature by technological marvels and industrial precision. Dove (2003) notes, while writing on man-environment relations in South and Southeast Asia, that:

> Community-level discourses in South and Southeast Asia tend to locate agency [of environmental transformation] either in nature or in the dialectical relationship between nature and culture. In contrast, national-level discourses tend to locate this agency in the state. The two points of view can be distinguished by asking whether a temporary cessation of human intervention in the environment will lead to restoration or further degradation of that environment. (Dove, 2003:

117-118)

India, the second most populous country in the world, has many of the most awe-inspiring features of the natural world. It is a land full of variety in landforms, and perhaps matching contradictions in cultural beliefs and lifestyles. It is also considered the storehouse of some of the earliest philosophical traditions, and thus a repository of knowledge that has enjoyed a continuous existence across millennia. Deba Prasad Chatterjee (2008) sought to underline the qualitative differences in Indian environmental awareness as opposed to the West. This contextual difference, he argues, has not been given due appreciation. He suggests that the higher level of technological prowess in Western societies has led to a belief among the general populace that nature can be 'conquered', whereas the general masses of India, a vastly rural country, have tended to live within the boundaries imposed upon them by environmental constraints. However, he also thinks that state -funded mega projects have often ignored the rights of these communities, and have usurped the environment from them in order to support the state's economic aims. Thus there is a fundamental point of disconnect between rural reality and state or national government projects that originate in urban areas situated far away (Chatterjee, 2008).

However, India is not a cultural monolith, and especially not so in the age of globalization. We have observed earlier that globalization implies near simultaneous change in places far away from one another and that change affects the perception of space itself. In the case of India, what is also observed is the fact that the country is at the forefront of many a globalizing trend. This is especially true in the case of urbanization. India, till recently, was a primarily agricultural, and thus rural nation. After the economic reforms though, things changed rapidly as industries came of age and places became more and more urbanized. Revi (2008) sums up the change like this:

> Only about 30% of India's population lived in urban areas in 2006……Over the next 40 years, India will experience one of the most dramatic settlement transitions in history, as its urban population grows from about 300 million to more than 700 million…Urban India overtook rural India in its share of GDP in the late 1990s, and urban per capita incomes are more than three times than those in rural areas. (Revi, 2008: 208)

Thus, India itself is full of dichotomies between urban and rural, which implies that there is little chance of finding a single ethos reverberating through the whole country. While Chatterjee's claims that Indians have been attached to nature in a qualitatively different manner cannot be negated completely, it can also be observed that globalization has fundamentally altered the landscape in

today's India, where global highways crisscross the vernacular rural scenery, and urban centers connected to the global urban circuit are growing within the traditional agricultural landscapes and reshaping them with influences from near and far.

What we conclude in this section is that there is a strong correlation between places undergoing urban transition, fragmentation of landscapes, and transfiguration of ecosystems. Of course, such changes come from the social transformation in which the means and modes to livelihood of those who are 'rooted in the local context' undergo change. The change can be gradual, disruptive, or a mixture of both these patterns. What shape it will manifest depends on the local level actors, the characteristics of the resource pool, the physical and temporal proximity to the urban centers, and the characteristics of the urban economy. In India, the changes have often been disruptive because they have been brought upon the local populace by the agents of the state, who often act as proxies for the forces of the globalized market, or for geo-economic forces that operate from urban spaces and consume rural raw materials to sustain those spheres of centralized activities. Thus, the changes are forced on to the rural populace, and they have little say over them; in other words, there is very little

choice involved on the part of the rural inhabitants over the mode of life that they eventually find themselves in after the transfiguration of the landscape.

3.6 The Changing Face of West Bengal: Some Points to Ponder

The Bengal basin region is one of the most densely populated regions in India. The undivided Bengal used to be the hub of activities in British colonial India, and the lower part of the state of West Bengal still retains fertile land especially suited for agriculture and widely known for its farming output. However, with the changing Indian economy, West Bengal's agriculture has also come of age. It does not only flourish thanks to nature's providence, but is increasingly managed by man, through the ingenious use of agricultural technologies, coupled with administrative measures like land reform policies adopted by the state governments (Rogaly et al., 1999). Gazdar and Sengupta (1999) point out that in West Bengal, agricultural output rose particularly sharply after the 1980s. Incidentally, this was also the time when the whole nation's economy also witnessed a remarkable upward turn of growth. Sen and Sengupta (1995) have analyzed the upward trend in agricultural output growth in most of the eastern Indian states at that time. Gazdar and Sengupta (1999) give the credit

to the passing of baton to the Communist Party of India (Marxist), better known as the CPI(M) after a long political uncertainty, and to its effective land reform policies. However, rule by the Left, it can be argued, has not been an unmixed blessing. Harriss (1993) has shown that though the overall situation in the state agricultural output has been remarkably bright, little reflection of land reform in productive output could be found in the villages in Bardhaman[6] and Birbhum. Harriss also points out that the development of groundwater irrigation had led to the changes that came in Bardhaman and Birbhum, rather than land reform.

Two things can be argued from these sources. One is that significant changes accompanied with significant sociopolitical restructuring might have taken place in West Bengal during the land reform years, but not all parts of the state were included in this transformation, and Bardhaman and Birbhum are notable examples. Secondly, widespread groundwater irrigation was used to push up agricultural growth in Bardhaman and Birbhum. Shiva (2002) has argued strongly that intensive withdrawal of water through tubewells and borewells leads to groundwater depletion in many cases.

Indeed, the drive towards industrialization and mega engineering projects has created its share of damage to the environment in West Bengal. The

issues of environmental degradation threatening the Bengal basin have been discussed by Basu and Ghosh (2004). They offer a number of cases of groundwater contamination, depletion of river basin ecosystems, and widespread industrial pollution in freshwater systems across the state.

The amount of change caused by human agents over time in Bengal becomes even more astonishing when a historical approach is adopted and the time frame is extended. O'Malley (1910), in his District Gazetteer report on Birbhum during the colonial era points out that the district was covered in forests, and a wealth of flora and fauna could be found, including animals like leopards and bears, no trace of which can be found today because of widespread felling of trees and the disappearance of the once common forestland.

3.7 The River Ajoy and the Issues Surrounding It

The Ajoy is a major river in Bengal. As I shall discuss in the next chapter, it is a major tributary of the Bhagirathi Hooghly. The course of the river has been described by Mukhopadhyay et al. (2006) as:

> The river Ajoy originates from an obscure hilly region in the Chhotonagpur plateau called Chakai (near Sarath of Jamui District in the state of Jharkhand) and merges into the mighty

> Bhagirathi at Katwa in the state of West Bengal, running a course of 370 km in the process. The geological feature of the vicinity of the origin is that of Archaean Gneiss (including Biotite Gneiss, Hornblende Gneiss, Quartzite etc.).
>
> The River flows for 192 km over this lithological condition. The middle part of the river basin is that of Gondwana sedimentary rocks. The river runs for 32 km through this landform. In the vicinity of Pandaveswar this kinds [sic] of rocks are prominent in the basin. In the middle part of the river basin older alluvium is also present in some parts. In the lower part of the course, from Bolpur downwards upto Katwa, landforms of recent alluvium of West Bhagirathi plain are dominant. Urban centres like Deoghar, Illambazar, Bolpur, Katwa, the well-known locomotive industry of Chittaranjan and a number of agriculture-based villages are settled along this river. (Mukhopadhyay et al., 2006: 11-12).

As the authors later point out, the river has become polluted of late, due to both biologically induced and chemically induced pollution, meaning that both traditional rural societies and industries located upstream are responsible for the decline in the water quality (Ibid, 86).

The river Ajoy and the issue of frequent floods are closely related, as pointed out by the authors (Ibid, 13). The two most devastating floods in recent memory occurred in 1978 and 2000. Both floods coincided with an extraordinarily vigorous monsoon in the given years (Chakraborty 2004), though the effect of an upstream dam has also been seen as crucial (Ibid). Sarkar (2005),

though, while analyzing the 2000 flood in particular, has pointed out that:

> Although, in some causes [sic, cases?], floods may get intensified by rainfall, they are not actually the result of rainfall. Emergency release of stored water from the barrage (to safeguard the structure from excessive load of stored water) may cause a *man made* flood; that had happened in some parts of the Bengal plain during 2000. (Sarkar, 2005: 61-62). [Emphasis original].

This is a rather surprising claim as research work and surveys of the same flood (Chakraborty 2004, Mukhopadhyay and Mukherjee, 2004) have found that the rainfall was a major factor, and the release of the water from the upstream dam exacerbated the magnitude of the flood.

The lower part of the basin, especially from the village of Satkahonia near Ilambazaar, is considered to be extremely flood prone (Mukhopadhyay and Mukherjee, 2005) and the two floods mentioned affected this area immensely.

The concept that man made changes have drastically altered the river morphology and its hydrology has been discussed by Mitra and Mukhopadhyay (2004). They mention bridge building and dam construction on the river and one of its tributaries as major cases of such anthropogenic changes. Most of these researchers are associated with Visva Bharati University in Santiniketan, and they contributed to a volume edited by Rahim et al. (2005), which seeks to look at the

different aspects of flooding. However, as discussed earlier, some of the papers make contradictory claims and it seems most of them deal with statistics regarding the hydrological aspects of flood, with little visible work on the social aspects of such events.

In a work related to the area, though not directed to the river basin directly, Basu (2005) has correctly identified the dualistic nature of the man-nature relationship in the village areas. He has pointed out that the same natural features that sustain people in one season can become constraints in other seasons. This is quite predictable due to the dynamism inherent in nature's forces. But Basu falls short of appreciating the complex symbiotic relationship between nature and man and advocates extensive engineering projects to drastically alter the landscape in a way tailor-made to man's needs and thereby make nature subordinate to man's wants.

CHAPTER 4: THE BENGAL BASIN AND THE AJOY RIVER

Bengal's soil, water, air and her fruits
Let all these become
Auspicious with Thy blessings…
Rabindranath Tagore (Translated by me)[4]

4.1 In the Beginning: Ajoy and Bolpur

The region formerly known as Bengal in India is home to some of the mightiest rivers in the subcontinent. In fact, two of the tree major Himalayan rivers, the Ganga (also known as the Ganges) and the Brahmaputra, flow into the waters of the Bay of Bengal through this area. The southern part of Bengal is predominantly sculpted by the delta formation of these two mighty streams, along with the Meghna, one of the broadest rivers on the planet, and numerous other big and small streams. After the partition of the country in 1947 though, Bengal was divided into two halves, the West Bengal state, which is part of India, and the East Bengal, which later became the independent nation of Bangladesh. The mighty streams were not neatly divided in half though, and the mighty Brahmapautra and Meghna flow through Bangladesh. Even the Ganga, which had two main distributaries, the Bhagirathi Hooghly in West Bengal and the Padma in Bangladesh, is increasingly channeling most of its waters through the latter

distributary, though the Indians are trying their best to deprive Padma of its natural water flow by controlling the flow of the mighty Ganga at Farakka.

This research looks at the issues of one of the main tributaries of the Bhagirathi Hooghly in West Bengal, which is, as pointed out earlier, one of the two main distributary streams of the Ganga. Thus, this research is confined within the state of West Bengal, and the term Bengal basin here denotes the part that lies within the political boundaries of India today.

The state of West Bengal stretches from the mountainous districts of Darjeeling, where snow capped peaks of the Himalayas are the main features of the physical landscape, to the lowlands of Sundarban, the world's largest mangrove forest (the majority of which now falls inside Bangladesh), where coastal lowlands, tidal plains and thick vegetation are the main features that meet the eye. The area in between is largely an alluvial plain, cut in two halves by the Ganga which flows nearly through the middle of the state in a west to East direction and gives rise to its two main distributary channels in the state of Murshidabad.

The metropolis of Kolkata (formerly known as Calcutta) is the capital city of the state and the second largest metropolitan center in India. It is also a key port in

the mouth of the Hooghly River, though siltation of the river channel has seriously hampered the navigability of the river over the years and these days big ships are unable to proceed to Kolkata. The port in Haldia was created to offset the challenge posed by siltation in the Hooghly and it is now the main port in West Bengal, along with being the base of the Indian Coast Guard. Kolkata dominates the political landscape of southern West Bengal and is one of the most densely populated cities in Asia and the world. The state of west Bengal itself has one of the highest population densities in India.

The Ajoy is a river that flows through the southern half of the alluvial plain in West Bengal, and joins the mighty Bhagirathi Hooghly waters in the district of Bardhaman (also known as Burdwan). It rises in the highlands of the state of Jharkhand, in the Munger district, and flows down through the big plateau region of Eastern India. The river enters West Bengal from the west, flows through it in a easterly direction and, further downstream, flows through plains formed by alluvial deposition. The river itself, has made a big contribution in the formation of this landscape. By Indian standards, Ajoy is not a very long river, its total length being about 370 kilometers, which means, nonetheless, that it is roughly the same in length as the longest river in Japan, the Shinano.

In West Bengal, the river flows mainly through two districts, Bardhaman and Birbhum. Bardhaman lies adjacent to Jharkhand, and houses some major industrial cities in the state. It is also situated at a higher elevation level than Birbhum, and is known for its characteristic red lateritic soil. Birbhum, the next district, is situated at a lower elevation than Bardhaman. It is known in Bengali as the *Rahr* land, meaning the 'land of red soil.' Birbhum has arid patches of land as well as fertile plains sculpted by the rivers, the Ajoy being one of the major ones. Bolpur town is situated at a distance of nearly 35 kilometers from the district capital of Suri. It is a 3 hour journey by train from Kolkata, the capital city of West Bengal. It used to be a small town, till in the late nineteenth century when a prominent Bengali philosopher of the nineteenth century, Debendranath Tagore, founded a theological school nearby in Santiniketan. That place was totally transformed in the next generation, when Debendranath's son, Rabindranath Tagore, transformed that theological school into a school for children's education in 1901, and 17 years laters, established a university in the same area, which has now become one of the most renowned universities in India, and the only central university in the whole state (i.e. not under the *state* government but the *central* government in the national capital, New Delhi). Santiniketan, over the course of a

period of a little more than a century, has become the pivot of the region. Side by side though, the township of Bolpur has grown in size steadily, partly due to the increasing popularity of Santiniketan as a tourist spot in recent times, partly to an explosion in the population of Santiniketan because of the popularity of the university as a destination for the young people, and partly to the attraction of the available land for settlement purposes by urbanites exhausted from the congestion in big cities like Kolkata but who are, at the same time, flush with funds.

The River Ajoy flows close by Bolpur. Bolpur is also the name of the administrative subdivision which houses Bolpur town itself, as well as adjacent towns like Ilambazaar, Kirnahar and Labhpur. The distance of the river from the Bolpur railway station is roughly about 5 kilometers, where it forms the boundary between the districts of Birbhum and Bardhaman. I chose this part of the river and its surrounding land for my research purposes, partly because I am familiar with it, and partly because it is the site of the ancient culture of the *Rahr* land, which is now rapidly vanishing before the juggernaut of urbanization. My survey sites lie within a 30 kilometer long stretch of the river Ajoy, from Ilambazaar to Bolpur and mostly comprise of very small villages along the river bank, populated by extremely poor people collectively known in the local jargon as ‘Bank Dwellers

of Ajoy.' They mostly live in thatched huts, and survive on foraging, subsistence farming and part time laboring jobs, and most of these small villages lack proper roads, electricity and health care. This land is undergoing a rapid transformation nowadays, and I myself, have seen the landscape altered substantially in a matter of a decade or so, most visibly through the erection of massive bridges, modern roads and a proliferation of people living in or attached to the towns of this region, which are striving to match the other bigger metropolitan areas of the state.

I began this survey in Santiniketan itself, the land that Rabindranath found to be 'an abode of peace', and the natural beauty of which inspired him to write much of the poetry that is cherished by millions to this day, and which brought him the honor of becoming the first Asian to win the Nobel Prize. For Tagore, this was a land where man and nature resided in harmony. However, things have changed since his death in 1941; more than six decades have passed, and if one takes a look at the landscape, man seems to be in a conflict with nature, if anything. Some environmentally concerned residents have voiced serious concern over the rampant urban growth in the area, which, they now see, is threatening the spirit of the founding father of the place. In his own writings, Tagore has expressed time and again his deep bond with the local landscape, with the streams

of water crisscrossing the red landscape and the rivers flowing in graceful bends and sustaining the villages that once defined Bengal as the granary of Eastern India (Tagore, 1961. In *Completed Works: Birth Centennial Edition*). Santiniketan, throughout its existence, has had a deep relationship with the local landscape, the surrounding rivers and the villages, and I hoped to find some useful information about the transformation in the landscape in recent times, especially from some of the students of the University of Visva Bharati, who are, at the same time, permanent residents of the locality. I eventually covered Santiniketan, Bolpur and Ilambazaar, the three urban centers, as well as small bank dweller villages of Bilsanda, Budhra, Keshermath and two bigger villages of Rajatpur and Satkahonia.

4.2 The Transformation in the Landscape

My first informant was an ex-student of Visva Bharati University. His father is a police official, and the family has been living in Bolpur town for more than 15 years now. I talked with the student on two different occasions and the following are the things that he had to say about the river and the floods in the region.

He referred to his mother, who said that she used to cross the Ganga on foot. The mother is nearly 50 or thereabouts, and this means that even half a century ago, when the Ganga was not reined in at Farakka, the stream was much faster and narrower. Now the same river has swollen to gigantic proportions in the area near Farakka, in the Murshidabad district. The characteristics of the Ganga river, before the Farakka barrage, was lots of sand and a shallow stream in the summer and a huge influx of water in the monsoon season. After the barrage was built, the flooding became remarkably more destructive as well as extensive. He referred this type of flooding as man-made, as man's activities in the form of construction on the river had actually made the river more dangerous.

His own first meeting with the Ajoy River was at 7 years of age, around 15 years ago. The prominent memories he has of that time are the huge Illambazaar bridge on the river, and memories of small slugs and snails that he used to play with when the river became narrower and shallower in summer and winter.

He also said that damming of the rivers has had a major effect on river regimes in general. This was a quite sweeping appraisal, keeping in mind the fact that the student is not a specialist in river geography or any other section of geography and environmental science. This seems to be a case where a

remarkable morphological change in a well-known river had played its role in changing people's perceptions, resulting in the creation of a general image of the repercussion of dams on rivers. But it can also mean that post-1950s, the dam building flurry in the state of west Bengal had had a lasting and in some cases permanent effect on the rivers of the state. He said that the monsoonal rainfall pattern has changed over the years. The rains came with much more regularity before, but these days the rains come in a flurry, often in a short period of time, and this in turn leads to flash flooding in rivers. In short the climate has changed so that the Indian monsoon has become erratic, and the result has been an increasing impact of floods, when they have occurred. This is a bold claim as the pattern of the Indian monsoon has long been a subject of intense research. The Indian monsoon is a dynamic system and as with any other system of global dimensions, it has its vigorous and lean phases. The lean phases may seem as telltale signs of 'weakening' of the system, whereas in effect they may only be a transient phenomenon within the system itself. Human memory is short, and can be constantly shaped and reshaped by the events around. Increased news coverage of catastrophic environmental change might well be a source of such an 'invented' notion that the monsoonal system has indeed changed. However, a real

transformation of the system cannot be ruled out. In fact what the student said might well be the symptom of theoretical projections which show a substantially more vigorous system as a result of global warming. A warmer planet means more available energy for the system, and a rise in the sea surface temperature means a direct increase in the number and ferocity of cyclones around the planet. He said that in 2007 the monsoon ended very quickly. And in 2008, the Monsoon started very early, in summer. This was indeed the case, as I can confirm, as the rains seem to have appeared early this year. However, in hindsight, I can also confirm that the rains have not ended obviously early this year. As I write the thesis, the rains go on in what is supposed to be a season of mild Autumn weather, with little rain and golden sunshine.

Another reason mentioned by the Mukhopadhyay et al. (2006) for floods in the Ajoy basin is that the carrying capacity of the Bhagirathi Hooghly at its confluence point with the Ajoy is significantly less than the peak discharge of the Ajoy. As a result, they argue, during excess monsoonal activity, Ajoy always has an excess of water which flows through the land, thus constituting a 'flood.'

Subsequently, from the student in Visva Bharati and quite a few others, I learned that erratic rainfall has affected the lifestyles of the people of this region,

some of who are dependent on the water of the lakes and rivers in the most direct manner. There is a village called Bangchtara (also known as Bangachatra) where fishing is the main source of livelihood. This village is situated within the Bolpur subdivision, towards Palitpur. The student said he has himself seen a change in the ecosystem as a result of the changed monsoon. The fish lay eggs after the rains come, and they are doing so earlier than ever now, and therefore the traditional fishing season, which used to nearly coincide with the major festive season of the Bengali people, is now steadily shifting towards an earlier period in the year.

4.3 Ajoy, its Floods and a Defunct (?) Research Cell :

Most students I talked to in Bolpur and Santiniketan remembered the instance of the famous 2000 flood as the most extensive they had seen. The waters rose to near the height of the railway bridge and the color was red, as a result of the waters washing in massive amounts of silt. The earthen embankments were breached at numerous places. However, there were other comparable instances of flooding in the river basin: the waters covered Muluk in the direction of Palitpur. However, almost all of the respondents said that a huge amount of rain was

associated with the 2000 flood. This is very important data, for we shall see repeated references to excessive rains that year. After 2000, there was no fresh instance of a flood of comparable scale.

While describing who would be the most affected by the flooding of the river, the informants said that the most endangered are a section of people who live near the river bed. They are livestock raisers and subsistence farmers and sometimes engage in masonry, running small shops, etc. They have practically taken over land in the river bed and have built their houses there. The actual duration of the flood in most instances is 15-20 days, but after effects continue for years.

Curiously, none of the people in the villages that I surveyed was aware of the existence or workings of the Disaster Management Cell of Visva Bharati University, which was advertised as a potentially major think tank by one of the university's ex Vice Chancellors, this means that either that the organization does not think managing the floods of the Ajoy basin is a worthwhile project to be involved in, or for all practical purposes the organization scarcely carries out any effective monitoring or planning work.

It was not possible for me to go to the Research Cell and talk to the

officials directly. However, I could gather some indications about the quality of the work undertaken by local NGOs, the managing head of one of which, incidentally, is also involved with the Cell. In the survey booklet by Mukhopadhyay et al., I came across this strange piece of information:

> Ajay starts to spill frequently below Illambazar[5] particularly after the confluence of Hinglo. (Mukhopadhyay et al., 2006: 13)

However, the fact is that Hinglo flows into Ajoy much further upstream than Ilambazaar, more than 30 kilometers further upstream from the point mentioned. Such sloppiness in the publications seem to be common, and the booklet also does not mention adequately when and how the field work data was gathered, what procedures were utilized, and what time frame was used. In the absence of these, the survey report becomes all the less credible when viewed critically.

4.4 In the Field: Excerpts from the Land of Winding Waters, Golden Sand

With these issues and other queries in mind I embarked on my first field trip on 7 August 2008. My facilitator was a young man called Harun Rashid. Harun is a permanent resident of the Bolpur town. He runs his father's business, of bricks, cement and construction.

The path to the site led us through the township of Bolpur, and through a

newly made road that has connected Bolpur with towns in the adjacent district of Bardhaman. Though it is a newly made road, there are already gaping holes all over it. The vehicles that passed us by are mostly ramshackle lorries carrying goods and people, men wearing *gamcha*, strips of cloth on their heads and waists. These big machines made a terrible noise while passing us by, apart from belching out black acrid smoke and showering us with red dust. The other notable vehicles were two-wheelers which constitute nothing short of a revelation in modern day rural Bengal. Stylish machines zip past us at breakneck speed, driven by people whose attire is a gross mismatch with the elegance of the two wheelers they ride.

Harun told me that recently Volvo buses plied the road for a while. They were fast vehicles, connecting Kolkata, the state capital, with Bolpur. The buses ran quickly for some days but in the end they were forced to stop indefinitely as they could not find enough passengers. The timing of the buses was the main problem, reported Harun, as they ran into direct competition with a train that the locals use very frequently.

The new road leads to another congested and narrow road, typical of Bolpur town, narrow and full of craters, where vehicles jostle for space with pedestrians and animals. The road passes by what seems to be a zone of small

industries of Bolpur. The furniture factories are quite common, and wooden furniture shops with men sawing planks of wood are a frequent sight. The trucks brought loads of wood and huge tree trunks and disappear inside the yards behind the shops. There are other factories, brick kilns and cement factories. Soon though we came to the ‘bypass’, an impressive highway channeling traffic in and out of Bolpur. This is a very deserted highway, though, and curves gracefully through places like Rajatpur, a small locality with a small school. Some odd potholes maintain a conspicuous presence on this stretch of asphalt as well.

This bypass twisted and turned out of the familiar cityscape. The sides of the road became stretches of green, rice fields with the plants swaying in the wind form vast belts of greenery. The road eventually climbed to the bridge over the river. The river was visible at a distance, and its huge bed and the high earthen embankments were prominent features in the vista ahead of us. The yellow colored concrete bridge traverses the channel and runs parallel to two other bridges used by the railway, a little distance apart. Beneath these bridges flows the river. Its north side is sandy and dry with eddies of water. Big sandbars dotted the river bed. The steep embankment coincides with the south side of the river, and the main water flow is there. Some trucks could be seen by the riverside, beneath

the bridges. We decided to go down and have a closer look.

The road led us below the road bridge. Some thatches stood beside some moss covered pondlets. People were drying cowdung cakes on the massive pillars of the road bridge. About 300 meters away was the steep embankment of the river. We made our way to where people were piling sand onto the trucks. The people briefly stopped working, distracted by our arrival. My DSLR camera was a major cause of distraction, they talked of us as photographers. The river, muddy in color, flows by the glittering yellow colored sand. We saw some boats in the water -- later we came to know that those boats pump sand out of the river bed. They pile it onto the trucks and sell it in Kolkata. The sand brings them good money. Later one person told us that they were small time farmers too. But most farm land is owned by others, so they can only earn a meager 40-50 Rupees farming, whereas by selling sand they can earn 80-90 Rupees a day. The Ajoy sand is prized for its good quality and is priced attractively in the construction sector. This was evidence that the construction sector, which is the harbinger of urbanization in and around Bolpur, has a decisive advantage over the traditional subsistence agriculture practiced here. Subsistence agriculture is ‘rooted’ in the river but the construction work requires the sand be lifted out of the river and transported to

faraway places, so it is governed by agents who are not ‘rooted’ in the landscape.

However, there seemed to be some positive outcomes of cutting sand from the banks and lifting it out of the river bed, especially the latter. The villagers said that lifting sand from the river bed makes the river channel deeper and the water holding capacity consequently increases. This is considered a boon as the river can run along without overflowing during times of heavy rain.

We made our way towards the railway bridges on the river. There are two bridges. One which is formed by arches going into the river is the older one, while the new bridge is built with huge concrete piers with rectangular bases. We learned later that the old bridge is times more massive. Its arch shaped pillars clog the waterway during times of high discharge. I could see the concrete piers of the new bridge have been transformed into open air lavatories in the process. It is not difficult to imagine that when the waters rise after rains in the basin region, the feces flow into the stream as the bases of the bridges get submerged very regularly, and they pollute the river water, increasing the population of bacteria.

Across the river lies the low embankment, which is, in visible contrast to the steep bank, not cobbled in stone. I climbed the steep bank reinforced with a stone embankment that rises more than 30 feet. Down below, the first defenses

against the raging water lay; some nylon sacks embedded in sand and forming a heap in places.

I could see the river flowing in streams past some sandbars. Some were very big stretches of sand. Harun told me that the sandbars are popular spots for picnic. However, some of them harbor quicksands, a hidden danger that claims quite a few revelers' lives every year. The river did not look very full of water, but the amount of water can be deceptive. This is a channel nearly 500 meters wide. We saw a middle aged woman wade into the waters for bathing. The waters came up to her jaw when she was barely halfway into the main stream. I found small shells and slugs floating by the stream, as the student of Visva Bharati mentioned while recounting his childhood memories.

We ascended the steep embankment cobbled with stones. We could see some thatched houses on the other side. Harun led me to one of the them. Very poor people live there, one glance is enough to tell that. Male members of the family were clad only in a loincloth (gamcha). There was a man who wore a shirt and trousers and he stood out in the group. As we approached the house we were met by inquisitive looks. I was introduced to a man in his 20s. A woman brings us some cane stools, one of them very torn. I asked the man about the floods of Ajoy,

particularly the two floods of 1999 and 2000. The inhabitants of the thatch all agree that the 2000 flood was the most destructive they had ever seen, the waters invaded the village and inundated it totally, some saying that the water level reached the height of the palm trees standing in the yard, which have an average height of 20 feet. Though the floods are frequent phenomena in the months of September/ October, since the devastation of 2000, they have not experienced a similar catastrophe and now they live in relative security beside the high embankment. However, they know that the security may only be temporary, and told me that there is no surety in their lives. They do not know if they can reap the crops they have sown. Yet they keep on farming. The woman tells me that when the floodwater inundates the village they have to move to the nearby high ground. After the waters recede they come back, hoping to pick up the strands of their precarious existence by the river.

Herein lies an important caveat. Harun told me that the people deliberately live in that area; they suffer devastation repeatedly but they are not willing to abandon the place, as they can get fat compensation from the government and other external donors in the aftermath of the flood. However, one of the local specialists on floods, Mukhopadhyay (2005), has written that the

people living off the embankments in Ajoy are practically dependent on the river: they are ‘rooted’ in the flow. Therefore they cling on to that existence not out of choice but out of necessity.

Which one of these claims is correct? As I talked to the villagers, they say that they have been living in relative security after the 2000 flood. The state government was praised, the government gave them tubewells for drinking water. However, it seemed doubtful that they were saying this out of genuine admiration. I could see the giant sickle and star mark of the ruling Communist Party of India (Marxist) on the bare, miserable wall of a house. This was the symbol of the party that has been in power in the state for decades now, and opposing it can only incur the wrath of the local leaders. These villages are politically marginalized as well, with the villagers commonly referred to as the ‘refugees’, due to their identity as migrants from Bangladesh.

They informed me that there is a primary school in the village. The school is run by the Panchayat (the village level administrative organ of the state government), which has also erected some tube-wells for a potable water supply in the village. They informed me that the river water cannot be used for drinking purposes, but they use it for bathing, cleaning, and bathing their livestock. A

major source of pollution in Indian rivers, as measured by different levels of bacteria, can be identified in these words. The river has ceased to be the source of drinking water in these villages, and they put dirt in the water, thereby releasing pollutants into the stream. I also saw a part below the bridge which has been transformed into an open air lavatory. However, why did the villagers choose to put dirt into the river? Is it a practice since time immemorial? Or is it due to the pollution of the water from industries located upstream that rendered the water unsafe for consumption? A definitive answer could not be found, but the lean flow of water, the change in the river system, and the industrial effluents present seem to be prime causes behind the abandonment of some of India's most notable rivers as sources of drinking water, perhaps most notably in the case of the photogenic Yamuna (Ramchandran, 2000). This is not to say that rural societies in India have always looked after the river and the farming population can be absolved of their share of polluting the streams, but a relatively recent abandonment of the river as a potable water source (the tube-wells are very recent) suggests a fairly recent collapse of water quality, which might be the result of the twin factors of industrial discharge and population pressure on the resources in the river basin. The Ajoy flows through some of the most heavily industrialized urban complexes

in Jharkhand and West Bengal, most of which are notorious as sources of pollution in air and water (Mukhopadhyay, 2006).

As we mounted the motorcycle and were about to leave the village, I stopped by a huge pillar of the bridge, dotted with drying cowdung cakes. As I started taking some photographs, I was approached by two small boys. They were very excited to see the camera and pose for photos. A little girl also came out but she was rather shy of posing in front of the camera. We were soon joined by an older boy. He told me that he studies in Class Ten in the nearby Bhedia High School (this means he is about to take the secondary level examinations in less than a year's time). His style of talking was remarkably different, in that he talks more of his dreams. He wants to go on to the Higher Secondary level and eventually progress to college level education, a rarity in that village. There are two colleges nearby in Guskara and Bolpur. For the moment, he seemed to be unsure of his future area of specialization. He said he likes English, geography and history, but is not so fond of mathematics. I asked him whether he would continue to stay in the village if he got a university level education. The boy replied that he would like to go out of the village by then. This answer showed that the younger generation is not so much 'rooted' in the soil. In fact the young

people are on the lookout for better opportunities, and most of them perceive that better opportunities are available in the cities. Thus the city life is aspired from a relatively young age. Urbanization is not only a usurper of rural lands: it is also itself as a dynamic cause of social change within the rural societies themselves, and is transforming the 'rural' by annihilating it from within. The evidence of this could also be seen in the worn-out clothes of the men lifting sands in a boat. One of them wore a torn, worn out blue T-shirt with the word 'Reebok' still clearly visible.

I talked to my companion, Harun, the local man, about the river and the scenes we had witnessed on our way back. He said that in his childhood, the river seemed much narrower and noticeably different. These days, he said, the floods create landslides, washing away sizeable sections off the riverbank. He said there were many *Sonajhuri* and Eucalyptus trees on the riversides and even in 1999, when he was in Class Nine, there was quite thick vegetation along the sides of Ajoy. We could see no trace of big trees on the river bank now, though some shrubs and thorny bushes raised their heads to greet us as we walked along. He told me that the big trees were all cut away for fuelwood purposes. The words 'fuelwood purposes', though, probably do not correctly account for the removal of

all the big trees. On our way to the township of Ilambazaar later, we went through a forest of *Shal (Shorea robusta)* trees, which are highly valued as timber for making furniture. It is not difficult to imagine that similar tracts of forest existed near the river and they were all cut down for an increasingly resource hungry population, till the date when the river and its surroundings were stripped bare of their vegetation cover. Today only a small amount of that vegetation remains in the form of this protected forest, and even now, allegations of illegal cutting of trees in that forest are very common. The loss of vegetation from the river bank and the landslides during floods are most probably positively correlated, i.e. the frequency and magnitude of landslides increase with the decrease in the vegetation cover that once held the soil together.

My companion could clearly recollect the devastating flood of 2000. He recollected the huge breaches along the river embankment, the flood waves reaching roof height and thereby inundating whole villages, the flood hit people squatting on the rail-tracks, and scores of dead bodies were floating in the river. His opinion on the floods differed from that of the villagers. He said that there was another major flood in 2006 when the waters rose to the roof height again. This seemed surprising to me, that the flood had taken place and yet was erased

from the villagers' memories. Upon further inquiry, my companion told me that the 2006 floods affected a different stretch of the river, further downstream. We later learnt that the magnitude of floods is perceived differently by different localities, as it is not the River Ajoy alone that inundates the villages, but some of its tributaries join in the act as well.

My companion told me that the standard crops in these areas are paddy, mustard and potato. The farmers are mainly subsistence farmers, they are very poor and many of them came from what is now Bangladesh (formerly East Pakistan) during the division of the country in 1947. They often engage in tenant farming as well, by farming plots owned by people in Bolpur. These farmers, he observed, are nearly helpless against floods, as they cannot evacuate if the waters rise swiftly. He attributed the causation of major floods to the release of water from dams, and said that he had seen people starving after floods had devoured the crops and the farmland and deposited sand across the floodplain. There were instances in the past where relief had to be dropped from helicopters as the water rose and inundated roads, and in 2000 even the rail link was not functioning for days. Some sizeable relief campaigns were organized by the residents of Bolpur and those efforts ran side by side with relief efforts of the state and central

government and some funds donated by NGOs and aid organizations. However, he said that a large section of the aid available never reaches the farmers, as leaders siphon off funds regularly. This administrative corruption, coupled with the lack of knowledge and interest about the villagers' lifestyles among the urbanites, he said, have made the villagers skeptical of the concept of relief itself. They are increasingly moving to an urban mode of life as well: younger men are working as laborers in Bardhaman and Durgapur, earning 3000 Rupees a month in the process. This information matched what I found out from the high school student's words earlier.

How people from different socioeconomic and sociopolitical backgrounds perceive the same phenomena differently was clearly manifested in the next stop of ours, the high school in Rajatpur village. Rajatpur is a vastly bigger village compared to the miserable collection of thatched huts by the riverside, and it has electricity and a concrete road, even though the road is full of craters. I approached the headmaster of the school for information on the river and its surroundings. He said he did not know many details and called over one of his teaching staff, a teacher of geography, who was also a local resident and had spent much more time in the locality.

The geography teacher flooded me with names of villages and semi permanent colonies by the river that were affected by the floods. He said that major floods took place in 1995, 1996, 1998, 1999 and 2000. All these floods, he said were results of excessive rainfall in the catchment area of the river and its tributaries. He said that the river had changed its course many times, and is heavily silted now. He estimated the level of siltation at 1 to 2 meters. He said that the river was so silted that the once towering rail bridge could now be accessed from the river bed by merely 'jumping up' onto it. However, he vociferously defended the dam upstream. The dam, he said, is actually a blessing as it has checked the floods. But as it is very small, during excessive rainfall years it has failed to stop floods from occurring. We later came to know that he was a member of the ruling party, and thus a supporter of the state government. He came up with the curious statement that sections of the river embankment were still being repaired after the 2000 flood, thanks to quick and wholehearted government efforts. The statement was ironical, as 8 years had passed since the floods, and yet the embankment had not been repaired fully, such is the competence of the state administrative organs.

Our next stop was the water monitoring station at Satkahonia. Satkahonia

is a village located near Illambazaar. However, the concrete road comes to an end where the village begins. Satkahonia is a medium sized village, numerous small bank-dweller villages exist in the same locality as well. The water monitoring station was said to be very old, and in fact, we later learnt from the Officer-in-Charge of the station that it was the first water monitoring station built for monitoring Ajoy. The landscape around us was a marked contrast to the town of Ilambazaar. Vast undulating mounds of red soil crisscrossed by channels of rainwater erosion made it a beautiful sight on one side of the earthen road. The earthen road is actually the embankment of Ajoy, and the river flowed on by the other side of it as we drove along.

The water monitoring station at Satkahonia was at least far better than the mud hut at Budhra near Bolpur, where not a single soul was to be seen. This was a concrete house, though a very dilapidated. We were met by a man who introduced himself as the Officer-in-Charge of the station. We came to know later that this man was practically all alone in the whole monitoring station as others around him had little or no knowledge of river systems or hydrology. We were received cordially, and requested to sit on some near broken chairs in a damp room with little sunlight.

As we were talking with the person in charge of the water monitoring station in Ilambazaar, some people arrived with a piece of paper. They said they had come from the nearby village of Mangalpur, with a mass petition that the village road be repaired. The rains in the monsoon season had removed slices of the long embankment of the river, which serves as the main road between the villages of that area. The officer read the petition and chastised them, saying it was foolish on their part to write that the road was barely navigable. He said that the state government had made roads everywhere and it was not correct for the villagers to say that the road was in bad shape, even though it was. They should have written that the embankment had been breached in some places. The villagers retorted that the embankment *was* the road in the villages of that locality and therefore saying the road was not navigable and the embankment was breached was actually the same thing. The officer backed down, and he accepted the petition. But he told the villagers that it is next to impossible to repair the breaches, as the government had given only 38,000 Rupees for the repair work and that was too meager an amount. He also informed me later that there is a chronic lack of personnel to carry out the repair work. In flood times, he is basically left all alone with some meager amount of cash. As the villagers left, the

officer casually left the piece of paper on the dusted table and started talking to me. I understood that the piece of paper, carrying the hopes of the villagers fighting a raging river, would probably have a very short life, and that such pleas die a premature death before they can reach the upper echelons of the government or are given recognition by environmental agencies. The officer, I later found out, was quite a knowledgeable person, he has been with the river for decades, and he knew a lot about the condition of the villages and the farmers. But he had learned to care less, for he could not do much for them. The complaints are regular and the assistance from the government is limited. He was careful to praise the government, for he is a public servant, but he also told that he is practically alone in the monitoring station. The only other people living there are class four staff, meaning they have almost no knowledge about geography, hydrology or the environment. They are just blue-collar workers. He has a computer, but no internet connection. He said that the computer was his personal purchase, as the state government does not provide such equipment.

By the end of this leg of my fieldwork, I had gathered the following points from the bank dwellers' villages:

1. The destructiveness of the floods seems to be on the rise, even as their

frequency has plummeted.

2. There seems to be a noticeable morphological change in the rivers after they have been subjected to big construction projects, especially after the construction of the dam in a tributary of the Ajoy upstream, with reports of the river spreading out wider downstream, while at the same time carrying less water and becoming silted.

While describing the lasting effects of the floods, most villagers said that sand splays are a chronic problem. Whenever the Ajoy breached its banks, sands were thrown all over the croplands and as a result no cropping was possible for 5 to 6 years.

4.5 The Culture of the Land and the Floods: From the Historical Annals

During my visit to the school, I heard from the headmaster that the river basin housed very old human settlements and a rich culture that was by no means less glorious than the one we can see at the present date. In fact, the headmaster said that the glory days of this region belonged to pages of forgotten history or near obscure myths. I felt curious to know more about that long past era and went to a well known historian in Santiniketan. As well as being a historian, he is also a

person with a very long association with the area of my research. He has been a high ranking state government official and is now also known as a writer. He has recently published a book on the history of this region, also known as the *Rahr* in Bengali, meaning ‘the land of red soil’.

The historian concurred with the headmaster in his opinion about the antiquity of the region’s history. He said that there were a substantial number of human settlements in the area dating back a few thousand years, and that chalcolithic settlements have been found in places like Mayureshwar, Nanoor and Ilambazaar, apart from in Bolpur itself. During the chalcolithic times, the Northern side of the Ajoy river i.e. the side closer to Bolpur, was the more inhabited. Remains have been discovered in mounds between Dubrajpur in the West and Kirnahar in the East, both sites situated within a few tens of kilometers from Bolpur. He further said that Nanoor, situated about 5 miles south of Kirnahar, and Beluti, situated 5 miles east of Nanoor, formed the three vortices of a triangle with Kirnahar. The remains of the settlement in Beluti are observable today as a nearly 5 meter high mound running between the Ajoy River in the south and the Kopai river in the north. Within this triangular area, there were a large number of chalcolithic settlements, arrayed in an impressive geometric shape. Recent

excavations have proven, he said, that Nanoor has enjoyed a continuous history of at least 5000 years, dating back to the post Harappan civilization times. Early historical age pottery has been unearthed from the mound called *Surath Rajar Dhibi*, meaning 'the mound of King Surath.' I remembered that the school headmaster from Rajatpur was also referring to the mythical king. The reign of this mythical ruler cannot be dated convincingly, but the dates, in any case, go back to at least a few thousand years, as noted earlier. Therefore, the region not only had settlements in proto-historic times; it almost surely had prosperous and sizeable settlements during the historical times that followed and until today, a history that is at least rich in the sheer number of years. What I could not investigate was a number of terracotta temples in this region, which bear testimony to the fine artistry that evolved across this region in historical times. I only saw and photographed a relatively very recent one near the river bank near Bolpur, and it is a beautifully sculpted piece of art. The historian also pointed out that one major challenge to the unearthing of further evidence of the historical richness of the place is the high rate of erosion that the relics of this region go through. Microlithic blades, stone shells and terracotta figures were unearthed from adjacent sites. All these settlements, he pointed out, must have had a vital

relationship with the river. He said the triangular region referred to earlier is more fertile than the rest of the river valley and it was here that the settlements were particularly dense and followed a clear linear pattern. This pattern is not an anomaly, as the Ajoy river, flowing through a red lateritic landscape in the Bardhaman district, flows closely by a separate groups of settlements, of which the most famous one is called *Pandu Rajar Dhibi*, meaning 'the mound of King Pandu.'

I asked the historian about the recent trends in the villages close by the river, and about the floods of the Ajoy. He said that village life now has become fractured. A part of the villages obviously have some of the facilities that we normally associate with modern life. However, the benefit is actually not evenly distributed in village society, and some sections in the village have become more prosperous compared to the others. A section of the villagers, he said, are still exploited very badly. They work all day long for a meager amount of money, and even the amount decided by state law is not given to them. The ruling party, he said, has a monopoly over power and that itself has created a few problems in its own. Even desperately poor people, if they do not support the ruling party, are not given the minimum ration they are entitled under the BPL (Below Poverty Line)

scheme of the government.

The floods, he said, are made more devastating by the release of water from the dams on the river. He recollected how the floods were increased to monstrous proportions by the sudden release of water from the dams. He said that in 1978, the flood wave that inundated the villages came at the dead of night, at 2:30 or 3 am, when everyone was fast asleep. The floodwave rose to a height of 5 meters, whereas the village houses stand at most up to 3 meters. The result was a complete inundation of the villages. He named a village, Basudha, that was completely erased from the face of the earth. The floodwave, he said, traveled along a channel through which the river flowed in earlier times. In short, the river changed its course and flowed through the villages, where its old path lay. The flood wave was the result of a huge volume of water released from the dam at Hinglo, and the complete absence of any warning about the release. Five days of incessant rainfall, he said, was the primary cause of the flood. Every river overflowed that year, but the secondary cause of the flood was the release of water from the dam, and that is actually what made the flood a killer event. It happened the same way in 2000, and if the death toll was substantially lower, it was only due to the fact that the communication system was relatively better in 2000, and

people were not caught off guard in the same manner as they were in 1978. But the flood in 2000 damaged crops extensively, a large number of livestock in the villages were killed, and the water remained stagnant for a long time. He observed that, though the villagers are still trying to pick up the threads of their life after that event in many places, they still live a fragile existence by a river which has devastated their lives in the past, and there is no guarantee that it will not do the same again.

4.6 My Last Stop: A Visit Back to Satkahonia

My trips to the Ajoy basin ended with a visit to the Satkahonia water monitoring station. On the way to Satkahonia, I was waiting curiously for the asphalt road to come to an end and the reddish brown embankment of the river to begin, for I remembered that the villagers and some of the people I talked to had been talking of some ‘minor breaches’ in the embankment almost every Monsoon. I soon saw what those ‘minor breaches’ were. In places, huge crevasses a meter or so wide ran through the embankment, so that only a strip of land at the corners held the massive wall of earth together. Goats were jumping over those crevasses, leaving people stranded behind them. If such a condition was the result of some

minor breaches, then I could imagine how dire things can be when the river becomes really destructive.

I had a long talk with the officer in charge of the water monitoring station this time. By now he was perhaps a bit more familiar with me, and his reserve had given away to frankness. He told me that there is little genuine interest for the plight of the people of this land. He gave me some figures regarding the flood and consequent damage. He said the river has a maximum discharge capacity of 300,000 cusecs [i.e. cubic meters per second]. If the river flows at this level, a 10 kilometer-long stretch of the Guskara Bhedia road will be breached. A slight increase in water will mean the inundation of about 10 villages, and as each village has about 5000 live animals, the loss of animal life alone will be 50,000. Most probably he was talking about bigger villages like Rajatpur, not the small collection of huts by the river, because it is not possible that the small bank dweller villages would have 5,000 animals. The cropland damage will stand at 2,135 acres. All of these would amount to damage of 267.7 million Rupees. This was a government estimate, probably a fairly conservative one. He said the main reason for the flood was the rainfall in the catchment areas and said that Satkahonia was the oldest monitoring station on the Ajoy, and had flood records

from 1916. He asserted that huge floods always happened in years when the Monsoon had been extremely vigorous, thereby proving that it was a natural event. However, without blaming the dam, he acknowledged that in the absence of proper monitoring mechanisms and properly trained personnel, flood management was an issue existing only on paper. He said the river has no central commission on it, unlike the neighboring Damodar River, which is governed by a state planning body. He pointed out that the absence of authority has predictably led to an absence of responsibility.

And what about the people living by the river side? It seemed to me that the small bank dweller villages are almost forgotten in the government and planning levels. The officer said that the villagers were mainly refugees who migrated during the partition of the country in 1947 from what is now Bangladesh. They have no home apart from the riverside, and they farm tiny plots and can even yield four crops a year. I did not see any appreciation in his tone for the indigenous knowledge of farming that these ‘refugee’ farmers possess, by virtue of which they can produce four crops a year without the aid of modern farming technology. And they reap their crops year after year from the same patch of land, thereby proving that their farming practices are probably more sustainable than

the practices with pesticides and chemicals that damage the soil and the ecosystem. He told me that another reason behind the devastation of the 1978 flood was the shifting of the river's course.

I was curious to hear the tale of the change of the river's course again. The officer was telling me that the 1978 flood altered the course of the river, and it has been flowing in that course since 1978. The historian in Santiniketan told me the opposite. He told that the 1978 flood caused the water to flow through the 'old channel.' Surely, only one of these claims can be correct. When I asked him further, the officer told me that about 5 kilometers from the railway bridge where I began my survey is the village of Bilsanda, and the river used to flow by that village and then took an elaborate turn to approach the railway bridge. Now, he said, I could see with my own eyes that the river is flowing in a much straighter course.

I went to see for myself whether what had really happened could be seen from the evidence present now. Our motorcycle descended along the earthen road from the railway bridge. We went past the hapless Budhra gauging station and drove on over the embankment. After a while, we came to a big turn in the river embankment. The turn itself stretched for at least 500 meters, if not more. But

beyond the turn there was no river. I could see that the river had retreated by quite a distance and eventually I came to a point where there was a bifurcation in the river's course. The river is indeed following a straighter path now, with the section without water, bounded by the meandering embankment, still retaining traces of the river's existence years ago. The bed of golden sand was still there, with small pools of water in the sands. A woman was looking after a cow by the embankment. I asked where the old river was. 'Right here,' she replied. I asked her when the last big flood took place. 'Six or seven years ago', was her answer. She added that the 1978 flood was a bigger one and it caused the river to flow in a different direction. Her words were virtually echoed by a young farmer in the village of Bilsanda, from where the river changed its course. He told me that his grandfather saw the river flowing by the village, but now it has retreated to nearly a kilometer away. As we walked along the embankment, the officer's words were matched by the evidence. The river 'changed' its course in 1978, and flowed through the villages, and that was perhaps what caught most people off guard.

CHAPTER 5: PATTERNS IN FIELDWORK DATA

> All things appear and disappear because of the concurrence of causes and conditions. Nothing ever exists entirely alone; everything is in relation to everything else.
>
> Gautama Buddha[7]

During my trips to the field, some issues stood out. The issues have been thematically arranged in this chapter, and the most important and relevant bits of data has been reordered under appropriate categories.

5.1 Urban Lures and Unfulfilled Promises: Finding the Concept of Liminality in the Ajoy River Basin

The area covered in my research is situated at a moderate distance from the township of Bolpur and is very close to the smaller adjacent town of Ilmbazaar. But it seems to exist in a world of its own. The concrete road that took us to the place was potholed and in bad shape. The main vehicles on the roads are trucks that carry goods to and from urban centers. The people living by the river do not have vehicles for transportation. In fact they do not have concrete roads connecting their villages. The main road is at times the earthen embankment of the river that winds its way through the village landscape. But the road is not

permanent, and it is always being shaped and reshaped by the waters of the river, the rainwater that flows into the river and other erosion agents. During the monsoon season, the water eats away at the foundations of this earthen embankment, and every year there are crevasses along the embankment, formed by the water erosion. This eroded road is treacherous and often is a big obstacle for communication between the villages that exist by the river. Every year the breaches are repaired, but the man in charge in the water monitoring station said that at no time are there sufficient funds for the repair work to fully mend the road, and the department concerned does not have the resources to solve this problem. It seemed to me that the most basic infrastructure for communication, road, is foreign to this landscape. It is not that the landscape was once different, or that there has been a degradation of facilities. It is very likely that the facilities were not there in the beginning. But what now is happening is there is an unfulfilled promise of relief for the bank dwellers. They cannot get it, yet they are promised that will get it, and they end up mobilizing manpower to petition the state authorities, claiming that have not had sufficient funds in any single year. What lies beneath this apparent reality is the fact that these bank dwellers have a liminal existence. They are marginalized by the roads and rail links that connect the urban

regions around them, but they have no stake in the same facilities. The landscape will change again, roads perhaps will be built in a not too distant future in these villages, but they will not be built to alleviate the plight of the villagers. Instead, they will be built to connect new places for capital formation when the exiting places run out of resources, or are too burdened with the pressures arising out of intense resource use, or even more dangerously, from the growing footprint of the urban centers that requires the procurement of places for dumping urban waste. A genuine concern for the restoration of the landscape is certainly not entirely unforeseeable, but in a nation like India, leaders of parties to the left, right and center of the political spectrum are increasingly worshipping industrial capital. Corruption in public offices is rife, leading to the overwhelming advantage of immediate monetary returns over long term resource returns, and this state of things makes the necessary investment unlikely.

5.2 Source of Identity in the Liminal Land: The River and the Bank Dwellers

People who live a subsistence mode of life are dependent on the river in the most direct sense. The river gives them the means for livelihood. They cut

sand out of its bed and send that to construction houses; they till and farm lands in the basin that are sustained by the flow of the river; and they even build their houses with mud from the river bank. These people, some say, are clinging onto their existence by the river because they have handsome material benefits. Whenever flooding occurs, it has been alleged, cash compensation is provided and the bank dwellers stand to gain hard cash in this process. This seemed a very questionable claim to me. Nowhere could I see any sign of opulence in the villages, which lead a very humble and even precarious existence by the river. A village woman told me that since her forefathers were alive they have been living in this area. To them, the relationship with the land is not only a means for their income but a source of their identity. She told me that when floodwaters rise high, both banks are flooded and in extreme cases they have to relocate to higher ground nearby. But, she said, they always look forward to returning to this area as soon as the floodwater recedes. What also seems very evident is the fact that these people have no special skills to position themselves favorably in the surrounding urban townships. They can and do work as laborers in the towns but in India, a country which is home to over a billion people, and particularly in West Bengal, where the population density is very high even by Indian standards, there is no

dearth of laborers in mid-sized cities like Bolpur. On the other hand, what the riverside offers them is land which they can cultivate at the subsistence level at least, and eke out a living in the process. Thus the allegation that the people who stay by a river, which has often taken their dwellings in the past, only do so due to the prospect of hard cash seems a gross exaggeration. What this also implies is a fundamental disconnect between the urbanites and the liminalized rural people. It is because the urban residents cannot fathom why the bank dwellers choose to stay in squalor beside the river, in what seems to them a meaninglessly uncertain life, that this kind of allegation surfaces.

5.3 Transformation in the River: A Tale of Dualities in the Social and Natural Systems?

The river, most informants agreed, has changed its characteristics in recent years. For the older people I talked to, this change was something they had witnessed themselves, but for the young people, the perception of the change came from the memories of their parents and grandparents. So, the evidence seemed to point to the fact that the river has undergone considerable change in morphology and characteristics in a length of time spanning a couple of

generations at most. The teacher of geography in a local school, Rajatpur High School, said that the river has become considerably wider now and its navigability has been reduced considerably. The headmaster of the same school, who was present during the interview, later told me that this contrast is even bigger when compared to historical times, when the river was the main route of transportation and the village of Supur was the location of the biggest port in the locality. He was talking about the pre-colonial period. He also told me that Supur was the capital of King Surath's kingdom, which is difficult to prove, for this pushes the history back to the Puranic ages. However, people familiar with the history and geography of the area seemed to agree that even in the recent past, the river was much narrower and the channel was much deeper. The teacher of geography recalled that in his childhood, the old rail bridge connecting Bolpur to Bardhamman district was so high from the river bed that one had to climb its pillars. But now the river is so silted up that it is flowing at a level far above where it used to flow even four or five decades earlier, and one can now jump from the river bed onto the rail tracks. This seemed a grossly exaggerated claim to me when I went to the exact location he was talking about. I saw that no one could really jump onto the rail tracks from below because the height is at least 30 feet,

nearly10 meters! In fact, the rail bridge is still so high that my camera did not show the rail tracks when I came close to one of its pillars and took a photo of it. Why did this happen? Was the man who spoke to me just lying or did he forget how high the bridge is now because he no longer visits the place? Both seem unlikely. What seems to have been the case is that when he was a child, which would be roughly four decades ago, the bridge being referred to as ‘the old rail bridge’ was the only bridge on the river in this locality. It was imposing structure in the landscape with its impressively built arches. For a child, the bridge had had a towering presence in his mind. In contrast, now there are as many as three bridges over that same stretch of the river, one more railway bridge to ease the rail traffic, and a road bridge. The once towering bridge is now the oldest of the three and bridges are not an imposing presence on the landscape but very much a feature to be expected. Thus, for the local people, the bridge has been diminished in its presence, and hence the man casually said that one can ‘jump onto it’. Obviously, this is not to deny that the river has not been silted heavily in all these years, but in spite of being silted, it has not quite come up to the height that would seem to be implied by the man’s words. What I find here is the juxtaposition of two very contrasting realities in the same landscape, which together make a new

'fable.' The first reality is geographical, or morphological, of the river being silted, broadened and altered in its characteristics. The second reality is that the man-made structures on that river have become increasingly commonplace and consequently the 'perception' of the landscape around it has changed in the local people's minds. The juxtaposition of these two has led to the 'imagined' reality or 'fable' that the *river* has changed drastically; and little realization that *the landscape* has undergone a huge change.

5.4 The Impact of Dams on the Transformation of the Riverine Landscape

The change of river morphology as a consequence of heavy siltation is important, since rivers have been seen to assume wider shapes after dams are constructed upstream, due to the altered hydrology and the reduced flow of water. (Chakraborty, 2004). In India, the main rivers were dammed for irrigation, electricity generation, and flood control purposes, and the major dam on the Ajoy is actually located where its tributary, the Hinglo joins its course in upstream Jharkand state. This dam, since its creation, has been a source of debate, as local geographers have pointed out that since the Hinglo Dam was created, the floods of the Ajoy have become much more menacing (Mukhopadhyay 2005). Conclusive

proof of this was not possible to arrive at during my fieldwork, since I was doing my work in an area situated at a considerable distance from Hinglo. But people seemed to agree that the river morphology and the hydrology have both shown remarkably different trends in the recent past, the time range of which is coincidental with the inception of the dam.

5.5 Continuity and Transformation in the Perception of the River in Bank Dweller Societies

The river itself has been changed as an entity not only in people's minds but also in their lives. This can be concluded from the facts that the river is no longer the main transport route in the region, nor is it the main source of drinking water. The evidence of the first is readily seen. There are no boats to ferry people to places by the river: the boats left in it are there to lift sand with pump-sets, or for fishing. The villagers by the riverbank told me that they bathe their cattle in the river and wash their clothes: its muddy water is not drinkable. I could not make a water quality analysis but Mukhopadhyay et al. (2006) note that:

> Pollution by biological parameters in the river water is noteworthy. Streptococci levels at all the stations exceed the tolerance level of 500 MPN/100ml. Chittaranjan, Illambazar and Katwa show the

> greatest diurnal variations among the five stations. Likewise, the coliform levels, indicators of organisms associated with biologically polluted water, are also high at all the stations especially during pre-monsoon season. Midday pH levels at Chittaranjan and Illambazar become about 8.3 indicating higher alkalinity. BOD levels also show low water quality except al Illambazar. High BOD levels are noted at Katwa and Sarath. (Mukhopadhyay et al. 2006: 34)

And,

> At the urban centre sites like Sainthia (M2), Illambazar (A3), Nabadweep and Krishnanagar (J3 & J4), where sewage water drain [sic] into the river, registered the higher MPN values of the bacteriological organisms [sic]. These cause health hazards. (Ibid: 86)

Thus, it seems that the river has ceased to be a source of drinking water and thus its existence in human perception has undergone a consequent change. This change leads to the change of the river water in turn, as there is no available technology to clean up the pollution. People find themselves resigned to the fate that the river cannot be brought back to its earlier purity, and they end up polluting it still more.

5.6 What is so Debatable about the Floods of Ajoy?

The floods are part of a natural process that gave rise to and sustains the landscape in this region. The floods used to occur annually in earlier times and devastated villages close to the river. The dams on the river, especially that on the

Hinglo, were constructed to ‘tame’ the river, to alleviate the flood hazards. Afterwards, the frequency of flooding decreased remarkably. However, reservoirs in India have had a poor track record of becoming silted quickly and unable to store water near their full capacity, and it seems that the Hinglo is no exception. Occasionally, it has to release huge volumes of water that gush down in sudden torrents and generate devastating floods. This is what Chakraborty (2004) observes with respect to the massive flood in the Mayurakshi River Basin (located in the same district of Birbhum, nearly 50 kilometers farther North to the region covered in my study) in 2000:

> The Irrigation and Waterways Department [of the state of West Bengal] claims that the reservoir at Massanjore has reduced the intensity of flooding by 30% as the flow of the river has been reduced from 377,000 cusec [to] 262,000 cusec. But the dams cause the pond level to rise and then releases [sic] water. So the building up of huge amount of potential energy is quickly changed into kinetic energy of rushing of water as the velocity of water multiplies many times. From 17th to 21st September 2000 Massanjores reservoir’s pond level was raised from [sic] 378 ft to 402 ft. so when released the water flowed down too fast causing inundation in the downstream areas. (Chakraborty, 2004: 30-31).

Mukhoadhyay et al. (2006) observes in relation to the Ajoy floods:

> The lower part of the Ajay basin has been has been suffering from floods since time immemorial. The evidence of flood in the forms of yellowish and whitish sandy silt layer, ripple mark with dunes

> and deposition of sediments of varied particle size has been traced in different sites. In the present century high devastating floods occurred in 1916, 1942, 1946, 1956, 1959, 1971, 1973, 1978, 1983, 1995 and 2000. Ajay starts to spill frequently below Illambazar particularly after the confluence of Hinglo. (Mukhopadhyay et al., 2006: 13)

The last sentence is highly dubious. The Hinglo-Ajoy confluence point is not *below* Ilambazaar[5], but far *above* it, as the Hinglo flows into the Ajoy near the West Bengal Jharkhand border.

The accuracy of this one claim apart, what causes the floods? From Mukhopadhyay et al., it is clear that the floods are a historical reality in this area. They identify three main factors behind flooding, two of them historical, and one of relatively recent origin. The first is the vigorous nature of the Indian Monsoon. The huge amount of rain that often comes at the end of the Monsoon season, mainly in the months of August and September, causes the rivers of the land to overflow. In some years the rainfall is remarkably heavier compared to the mean rainfall and floods are a natural consequence of this phenomenon. The second cause is the fact that the carrying capacity of the Bhagirathi-Hooghly River at its point of confluence with the Ajoy is far below the volume of water that the latter discharges during peak flow times. The third cause is the effect of dams on the

Ajoy, especially the major one on the Hinglo, which have caused the river bed to become silted. In years of extreme rainfall, sudden and enormous volumes of water were released from the reservoir(s) that flooded the land on both sides of the river (Mukhopadhyay, 2006). Chakraborty (2004) sketches the role of the dams and reservoirs in a much more direct manner:

> …the effects of these dams and embankments lies [sic] in the ability of these works of technological marvels to change the intricate functions and parameters of a river system which act as a group to the maintenance of the whole system. Thus their effects are not short termed but their ill effects build up slowly through decades unnoticed. (Chakrabory, 2004: 30)

However, the claim met staunch opposition when I talked with the teacher of geography in the local school. He strongly maintained that the Hinglo dam is not responsible for the floods. In fact, he said that the dam checks floods. He informed me that the local people were misled by certain NGOs that the Hinglo dam causes flooding in their localities, and in order to know the truth, the local people trudged their way up to the Hinglo confluence point. He said that he and others led this mission, and in fact they found that the Hinglo is a very small dam, It cannot discharge so much water as to create catastrophic floods. This was also the claim made by the Officer-in-Charge in the Satkahonia Water Monitoring

Station near Ilambazaar. The historian in Santiniketan, who has seen the devastating floods with his own eyes, though, differed in his opinion. He informed me that both the 1978 and 2000 floods can be partially attributed to the Hinglo, apart from the obvious contribution of the exceptional rainfall in those two years. In both instances, he said, huge amounts of water were released from the dams [though he referred to the Hinglo dam as *barrage*, which seems to be a mistake]. He told that the 1978 flood was primarily caused by an excessive spate of Monsoonal rain that fell ceaselessly for 5 days, and then secondarily by the release of water from the dam that took place at midnight. The torrent swept away the villages in the southern bank of Ajoy, towards the township of Guskara, which is an extremely low-lying area and is flooded whenever there is excess rain.

What can we establish from these two differing claims? Apart from the people who were beneficiaries of the state government directly, people seemed to agree that the dam is related to the floods in some way or the other. Chakraborty (2004) in his analysis has been direct in holding the dam responsible for the floods, while the historian I talked to, who is also an eye witness of the events, concurred. In contrast, the village geography teacher is an active member of the ruling party and the Officer-in-Charge is a state government official. The emergent pattern

therefore is quite straightforward and predictable. The state government people sought to defend 'their' dam while the general public held it responsible, at least partially, for the floods. What can be observed further is a deeper reality. Neither camp is totally wrong, nor is any one of them fully correct. The defenders of the dam ignore the capacity of the dam to alter river morphology and hydrology, and it is a fact that the dam discharged water in huge volumes both in 1978 and 2000, the two worst floods in records (as verified by the Officer-in Charge of the water monitoring station), as well as in public memory. However, the dam alone did not lead to the massive floods. The rainfall amounts in those two years were abnormally high (as everyone's memories concurred, and so did the records) and there are numerous small streams and rivers joining the Ajoy, like the Hinglo, Kunur and Patro Nala, which overflowed due to the excessive precipitation. Thus the floods in the Ajoy basin were composite events, formed by three factors: excessive precipitation, dam discharge and overflow of tributary rivers in the basin. This composite picture has never been clearly expressed in the existing literature, whether in the case of books by Mukhopadhyay et al. (2006), in reports edited by Mukhopadhyay, or in surveys carried out by the NGO, Akhil Bharat Bhuvidya O Paribesh Samity. This NGO tended to zero in on the dam dimension, and this has

resulted in a one dimensional explanation of the events, which seems to grow out of the 'prefigured' approach on their part that dams must be responsible for big floods. What we see here is a case of perspectives growing out of sociopolitical or socioeconomic scenarios, and vying with each other to become the standard version of reality. In doing so, both end up in fragmenting the landscape through perceived realities and generating 'fables' or imagined realities.

5.7 Floods as Perspectives: Social Construction of Flood

Flooding in the Ajoy basin is not only a composite phenomenon, but it is a socially perceived phenomenon as well and therefore there is no universally agreed upon and correct definition of 'flooding' in these areas. Rather, flooding is perceived differently at different sociopolitical and socioeconomic levels.. This is what has often been ignored by the local scholars, for I could not find it in any of the published literature. In his unpublished thesis, Chakraborty (2004) writes:

> The extent of flooded area -- seen by the unblinking eye of the Canadian satellite 'RADARSAT' and as stated by the Institute of Wetland Management and Ecological Design—Government of West Bengal—was 6898 sq. km compared to 23756 [sq.] km as measured by the State Irrigation Department. (Chakraborty, 2004: 29)

The anomaly is enormous, but Chakraborty then goes on to explain that RADARSAT was not able to measure a large area. However, he maintains that the State Irrigation Department was not wholly honest in giving the spatial extent of the 2000 flood. The reason he suggests is that the Irrigation Department deliberately gave a falsely exaggerated figure and even falsified the amount of rainfall to portray a large 'natural' flood, whereas the reality was that the flood was 'man made.' He writes:

> …according to data 1066 mm rainfall took place at Suri, where as [sic] rainfall only 5km away was reported to be 667 mm, so a question arises, that a difference of 499 mm [in] rainfall in areas only 5km apart, can be meteorologically be possible? (Ibid: 28)

The apparently persuasive case though, when analyzed from the ground, poses quite a few questions. I went to two gauge stations on River Ajoy. One was Budhra near Bolpur and the other one was Satkahonia near Ilambazaar. The Budhra gauge station is nothing but a mud-house, standing forlornly on the steep bank side of the river. The roof is made of hay and the only thing that marks it apart from other humble mud-houses of the village is a yellow colored signboard that proclaims the structure as a gauge station. When we went near, no one could be found inside, and as far as I could see from the locked grill door, I could only see a kerosene lantern, a bed and a bed-sheet inside the one-room station. No

instruments, no files, and no trace of electricity or any electronic communication tools was to be seen. I took a photo of the place. My visit to Satkahonia was a very different experience, as it is a brick housing complex with a large garden. Inside the station there are generators, a computer and telephones. However, the files that supposedly have the data on the Ajoy are rotting on a wooden shelf, piles of moth-eaten papers that have turned brownish yellow and are barely readable. I took a photo of these files as well.

What seems clear from these two experiences is the fact that for the Ajoy basin gauge stations, there is often a total lack of any facilities to measure anything. At best, there is partial provision, but the records are kept in such a manner that they are often not retrievable. The Officer-in-Charge himself admitted that there is a woeful lack of trained personnel, and he alone was occupying the fort with some staff members who had no knowledge of scientific measurement. In this scenario, the two rainfall readings offered by Chakraborty are not conclusive. Either one or both could be anything ranging from false (in a scenario that they were never taken and just imagined or taken by those who could not measure properly), to errors of measurement due to instrument condition. It is certainly not improbable that one of these readings was taken by a man wearing

only a loincloth, shielding himself from the driving rain with an aroid leaf over his head.

Next, the claim that the rainfall figures mask the reality, the culpability of the dams in the Bengal basin with respect to the flood in 2000, is also a partial truth. The extent of floods can differ according to who measures it and how the measurement is done. For someone measuring a flood through satellite imagery, a flood is what is definable through the parameters recognized by the monitoring system and the analyzer. However, for the people who live close by the riverbank, a rise in the river water level seems to be a ‘flood’, as the rising waters, if spilled by a river whose hydrology and morphology have been altered by a combination of human and natural agents, happen to threaten their shelters and existence in some way. The shelters, as I saw in the field, are mud houses which are extremely vulnerable not only to water rising from below but also to rain falling from the sky. It may be the case that the one of the reports of the floods took into account reports by the affected people whereas the other one simply took the physical parameters. When RADARSAT is involved, the extent of flooding is judged from the physical parameters of the phenomenon.

5.8 Who Knows Best?: The Local Level Knowledge Vacuum

The absence of scientific monitoring of the river and the ecosystem in the basin region is a major problem for researchers as it is extremely difficult to separate myth or 'imagined' realities arising out of improper investigation or conclusions of poorly done studies that have been carried out so far. I found that only a single book on the flood problem in the lower Bengal basin and river basins like that of the Ajoy has been published so far, by the Natural Disasters Management Cell of Visva Bharati University, the most famous university in the region. The cell was created in 1996 (Mukhopadhyay, et al., 2005). When I asked the people on the Ajoy banks if they were aware of the activities of the Disaster Management Cell, all, without exception, replied in the negative. This seems to point to the fact that though the Cell exists physically, its activities have fallen far short of what a central university research cell should be capable of. I could not explore the reasons behind this inactivity, but the evidence is clear that in Santiniketan, no comprehensive research has been carried out by this Cell concerning the river dynamics and the basin ecosystem, which could have been extremely useful for flood forecasting and flood relief works.

The lack of awareness and appreciation of local cultural patterns and

ecosystems can be seen in the region concerned as well. I remembered having seen a lot of trees on the banks of the river, but on my trip to the field, I could scarcely find any. When I was talking to the village geography teacher, I asked him where the trees went. He replied that they have been systematically chopped down as they posed a major threat during peak monsoon season, when the rains and the riverwater would combine to erode their bases, and they fell dislodging a huge amount of soil, creating mini breaches all over the earthen embankment. He alleged that such mini breaches posed a threat of flooding for the bank dweller communities and so the trees were cut down. To me, the logic seemed dubious. Chakraborty (2004) has observed:

> Measures to control soil erosion along riverbanks to increase bank resistance is another measure to control flood. Bank protection with loose stone and mud….*aforestation in erosive soil*…are efficient measures in this perspective. (Chakraborty, 2004: 17) [Italics mine]

The incentive behind chopping down the vegetation seemed to be entirely different. As the whole region becomes more and more urbanized, the vegetation is cut down to create croplands, in order to produce more food (Ibid, 30), or for the production of timber for the furniture companies. If one travels from Bolpur towards the Ajoy by road, one has to cross a vast tract of land thickly covered in

Shorea robusta trees, locally known as Sal. These are big trees and they are prized for their timber. This part of the land is now under protection but similar vegetation that can provide timber for the growing furniture manufacturing business in Bolpur and Ilambazaar may be the real reason behind the disappearance of vegetation from the riverbanks. When a forest or some vegetation cover is cut down, the loss is not only limited to the number of trees that are lost, but it also involves the destruction of the ecosystem that depends on and is sustained by the vegetation.

Another area where there seemed to be a lack of proper knowledge is the indigenous practices of subsistence agriculture. The Officer-in-Charge in the Satkahonia water monitoring station informed me that the bank dweller communities, whom he referred to as 'squatters', yield four different crops in a calendar year in the fertile soil. He said that these people are most affected by floods as they doggedly refuse to move when waters rise. I saw little appreciation on his part of the remarkable skill of these poor farmers, who can grow four crops on a thin slice of land in a year, without the aid of sophisticated technology. This practice requires detailed understanding of the floodplain land and seasonal characteristics of the region as well as knowledge of crops and cropping methods. Such indigenous farming practices all over rural India are in trouble now, and they

constitute the vastly rich tradition of sustaining the common pool of resources in rural India, as exemplified in a remarkable paper by N.S. Jodha (2007).

5.9 The Swings in the Mood of the River: How the Ajoy Creates and Devastates its Basin Communities

One of the most important factors behind the devastating flood in the Ajoy basin, in 2000, worth mentioning separately, is the change of the river's course. When a river changes its course, often after excessive downpours, the result is usually catastrophic. The biggest flood in the year 2008 took place in the Kosi River basin in Northern India, where the river abandoned its course and flooded the settlements that came in the way of its new path (Times News Network, 2008). Similarly, the Ajoy changes its course at times, and whenever it changes its flow, the villagers close to the banks face the maximum threat of being swept away. The historian in Santiniketan told me that the devastating flood saw the river change its course and go to its 'old' channel. The result was inundation of settlements located along this path. As the Ajoy has little water during non-rainy seasons, after the river changes course, people start living practically on the old channel as they find fertile land for cropping. In 1978, the river suddenly

flowed into the old channel, leaving the hapless villagers with no escape route. Because of the sudden release of water from the dam, the river swelled to gigantic proportions, and the water rose to a height of 15 feet (nearly 5 meters). This would mean that the settlements that came in the way of this massive flood wave were all wiped out, for the village mud-houses are not higher than 10 feet (3.3 meters). The village of Basudha, mainly inhabited by people who came from Bangladesh at the time of partition (1947), which was famous for its rich crops, was totally annihilated. A vast area became affected by sand splays. There were numerous breaches along the earthen embankment of the river in 2000 as well, and though the loss of lives was less compared to 1978, the damage to crops was much more extensive. The geography teacher in the village high school also spoke in similar terms: he pointed out that the village of Geet Gram was totally inundated by the raging waters in 2000, and the 64 households in that village have since been relocated elsewhere. The Officer-in-Charge in Satkahonia informed me that the 1978 floods saw the river change its course. Since then, the river is flowing through a new course, after abandoning its older course, which again came at the expense of widespread inundation of settlements. The state government had tried to alter the flow of the river since 1970s, by trying to divert the water into a

straighter path that happened to be a rivulet by the main channel. But the efforts were unsuccessful till in 1978 nature decided to take Ajoy into the straighter course. These were conflicting claims. If the river changed its course in 1978 and has been flowing in that course since that time, what is the logic behind its waters entering the ‘old’ channel in 1978, as the historian claimed? Clearly, the two claims could not be correct simultaneously. The Officer-in-Charge told me that I could see the point from where Ajoy changed course in 1978. When I arrived at the location he suggested, I could see that the river bifurcated from a point. As for the channel that now lay without water, I could see that the high embankment eventually met the high embankment of the present channel near the Budhra gauge station. While taking a closer look, I found that the old channel went for some distance, about 5 kilometers, and then turned towards the present flow. The huge turn, that itself spanned half a kilometer at least, suggests that this old channel was not man-made. This seems to indicate the truth in the Officer-in-Charge’s words. However, it is highly probable that the river shifts its course repeatedly, spanning a vast territory. This change of the river course is what gives an extra and devastating dimension to floods in some years. So far, this phenomenon has not been fully appreciated by the local geographers, and there is

no study indicating whether the shifting of the river course follows any pattern across time, to what extent the upstream dam can be held responsible for changing courses, as described by Goudie (2000), whether the changing courses can be predicted with acceptable accuracy, or whether everything is purely arbitrary in this river basin.

5.10 The Vanishing Diversity: Endangered Cultural Variants in the Liminal Land

What the change in lifestyle and the transformation of the social landscape in the region covered in my study suggests is that, as a result of modes of engagement with the landscape undergoing changes due to the effects of urbanization and globalization, the indigenous cultural diversity is steadily dwindling. Near the Bolpur road bridge on the Ajoy stands a beautifully sculpted temple of terracotta. It is said to be from precolonial times, a structure standing for 300 years. The once red clay temple is now covered in black moss. This implies that the temple has lost its place in the local life of the place. The artisans who crafted the temple walls are no longer to be found, and their art is also a dying skill. The new temple of the area is probably the gleaming campus of the Bengal

Institute of Technology and Management (BITM), with clay frescoes adorning its twentieth century walls. For the present generation, clay sculptures are things to be cherished as exotic relics, but the centuries old temple suggests a culture in the Ajoy basin that experienced its own glory days, and those days were probably not less glorious than the present day, when the region is trying to catch up with the urban centers by following a path shaped by urban infrastructure and at a pace dictated by urban needs. This contrast between the historical and the modern is natural, but it nevertheless comes at the expense of the vernacular, as the urban mode of life overshadows other modes. The result is a depletion of the cultural pool of the land, as noted above, which can imply a further degradation of the river basin ecosystem in the absence of rigorous monitoring of environmental standards and natural resources of the land in question.

CHAPTER 6: TOWARDS A SYNTHESIS

> …it is much more difficult to understand human history than to understand problems in the field of science where history is unimportant and where fewer individual variables operate.
>
> Jared Diamond[8]

How then, to make sense of it all? I started this work quoting sections from works of environmental experts, urbanization theorists, scholars of landscape and man-environment studies and commentators on globalization. I went to a stretch of a river, meandering in graceful bends through a landscape that even a generation ago was predominantly rural, but is now undergoing a swift transformation due to currents of urbanization and globalization sweeping through India. What I sought in the field was evidence and indications of how man's relationship with nature underwent transformation due to socioeconomic and sociopolitical changes like urbanization and globalization, and evidence of continuity in face of change. My fieldwork resulted in the findings that I have described in the previous chapter. In this chapter, I look at the broader canvas, how to explain these findings with respect to theoretical frameworks that I referred to in earlier chapters.

6.1 How the Distant and Surrounding Urban Centers Change Ajoy and the Vernacular Landscape in Ajoy Basin

As we have seen from Scott (1997), cities can be identified as prime agents of change when transformation of the local landscape is concerned. Cities are referred to as 'privileged spaces' (Ibid), as places which act as nodal points for the flow of the global industrial economy, which we can now identify through the twin phenomena of globalization and urbanization. During my fieldwork trips, it was very clear that the main forces of change in the river basin are the urban areas. The dam on the river, which is seen by many as a defining structure because of its capacity to substantially alter and reshape natural phenomena and natural systems, was not built by villagers. It is a very much an urban product. The responses regarding the dam from my fieldwork can be divided into two sections. The defenders of the dam were people who lived in the urban areas, who had little chance of being affected by the floods anyway and people related to the state and the ruling party. On the other hand, the bank dwelling communities had little knowledge about the good or bad effects of the dam situated many kilometers upstream, but they could clearly point out that the river morphology and consequently its hydrological trends have all been noticeably altered in the past two generations or so. This makes the changes conspicuously coincident with the

construction of the dam and a correlation seems to emerge between the two from this. However, there was no smoking gun from the fieldwork data which would implicate the dam as the sole factor behind the devastating floods in recent times. More research is certainly needed on the capacity of the dam, on the specific amount of water released during the flood and non-flood years, and the timings of the releases and the timings of the flood waves downstream. However, one point becomes very clear. The dam is supported by the people who work for the state government who erected and now control it, and the seat of that government is the huge metropolis of Kolkata. Therefore the identity of the leaders of the state is primarily urban. This seems to be a counter-intuitive claim as many of the state leaders are elected from villages. However, all decisions regarding the controlling of the dam are taken in an urban setting. Thus, the decisions regarding water releases from the Hinglo dam on the Ajoy reflect how a distant urban center influences the vernacular landscape in the rural areas. During the fieldwork, I got ample indications that this vice like grip on decision making that the faraway urban centers enjoy is unlikely to change in the near future. If anything, India is steadily becoming more urban (Dyson and Visaria 2005) by the day, and from my visit to the water monitoring station in Satkahonia, it was clear that the foraging

and subsistence farming population on the river banks have very little or no wherewithal to make their voices heard at the decision making levels situated in remote urban centers that control the fate of the landscape that they have been living in for generations, and thus control the fate of their societies and social identities.

As far as the more physically proximate and surrounding urban areas are concerned, their effect on the landscape has been much clearer in terms of physical evidence. The steady depletion of the vegetation on the river banks is vital evidence. The village schoolteacher said that the vegetation was removed through a 'collective decision.' Whose collective decision? Certainly, the trees were not cut down by the bank dwellers, as they had been living with the trees for generations. The decision, it seems, was not 'collective' but one imposed by the people who had more bidding power, and who could actually gain more from their cutting. If the proliferation of wood furniture industries in surrounding Bolpur and Ilambazaar is any evidence to go by, then it seems to be a clear cut case of urban resource hunger being reflected in the rural landscape that is steadily becoming bereft of vegetation.

The roads and bridges by and over the river constitute another case of the

direct influence of the proximate urban centers on the rural landscape. The roads and bridges connect the *urban* areas. In the case of the villages that somehow exist by the river banks, the only road is the earthen embankment of the river, and that too, as I could see with my own eyes and hear from many villagers, gets badly damaged when the river decides to go berserk, or simply with the monsoonal rainfall that is a regular feature of the climate of this area. And the road, badly breached in places because of the erosive nature of water, does not get repaired. The officer in the water monitoring station said he was not allowed enough money by the government to repair the road meaningfully. There are strong possibilities of the money actually available being misused along the way, as the level of corruption in public offices is quite high, but the main thing in the end is that the money is *not available* for the repair work of the road. Had the road been one that connected two urban centers, the situation would conceivably have been very different, with the aggrieved urbanites having enough resources to pile the pressure on the state government to actually redress the problem. Thus, the problem is not merely one of corruption or lack of responsibility, but it is a fundamental problem of urban areas cornering the resources for *their* development, and that development, more often that not, comes *at the expense of* the resources

available to the rural areas, and thus, consequently, their development.

6.2 How the Relationship with the Land has Changed, and in What Respects it Continues to be the Same

The human relationship with the land has seen many phases and quite a few changes. When human societies were foragers, the land they belonged to was of vital importance. The land offered them food and game and in no ways were the human beings able to get anything *more* out of the land and the natural ecosystems that they did already. Next, when the societies became agrarian, human beings were able to coax the land to yield more than it normally did under foraging conditions. In both these phases of human society, man was relatively closer to the land than in the times that followed. During the industrial phase, people became able to transport raw materials from other faraway lands to the land in which they preferred to live, or preferred to produce in. The result was a detachment from the land that offered the natural bounty, the industrial raw materials, as men carried them off in ships and trains and automobiles. Many scholars have been talking about a fourth transition, a transition to the so called 'information age' where the matter of utmost importance is the information about the raw materials, or natural bounty (Toffler, 1991). The circuits of the

information economy favor the big metropolitan areas which have the necessary infrastructure built in them (Sassen, 2001), at the same time further accentuating the decoupling of man from the land that he belongs to, or that he is sustained by. India is a country that was primarily agrarian even a single generation ago. But with the boom in industries, the country has become more and more urbanized in the last two decades, a process that is accelerating all the time. The case in the Ajoy River basin is not an anomaly. It was, and still is, a fertile tract of land suited for agriculture, but the boom is in the growth of cities and townships in the area and in the industries that are located in the cities. The urbanizing societies in the towns of Bolpur, Santiniketan or Ilambazaar are more and more oblivious to what the river is, what the societies in the basin area used to be, or what change urbanization is causing in the ecosystem of the area. For a large part of the year, the river does not figure in their thoughts, except during casual picnics by the riverside, and it only catches their attention when it bursts its banks, floods villages, kills men and animals, and jeopardizes traffic traveling to the urban areas. Thus, the floods of the Ajoy which historically had replenished this land as floods in most river systems do, have now become ‘disaster’ events which must be prevented at any cost, for the disruption they cause is not comfortable for the

functioning of the urban society. With the apparent inactivity of the Disaster Management Cell of Visva Bharati as far as the floods are concerned (it must be one of the most richly endowed cells in terms of funds in this area, as it belongs to the only Central University in the region) suggests that the urban planners or disaster managers are not much concerned about the plight of the bank dwellers' villages. They are more concerned with how the 'disaster' in terms of loss of lives and property can be managed. This piecemeal approach has little prospect of addressing the issue in a holistic manner, where the human dimension of floods can also be taken care of. This behavior of the urban planning bodies is not entirely unpredictable, for they are divorced from the vernacular landscape and thus their view is that of the outsider, of someone who *consumes* the landscape through the process of observation. It is in this regard that the findings of this survey match Cosgrove's idea, that the relationship of man with landscape undergoes a fundamental change with the transition in the mode of production that sustains human societies. What is more, it can be suggested that such transitions are not comprehensive. They always occur in a manner that sees the transition covering only a part of the society that dwells in the given landscape. The other part becomes disentitled in the sense that the part of society 'one transition ahead'

has more purchasing power and thus more bidding right over the resources that the land offers. The historian in Santiniketan spoke of the disentitlement of sections of rural society. Thus, it can be argued that the social transitions or the transitions in the modes of production in societies are deeply divisive processes: they always disentitle communities, or communities within communities, and so on. It is in this regard that the transition that is taking place now also in a sense constitutes a continuity. For if similar analyses were made in earlier transitions in the Ajoy basin, say that from a foraging society to an agrarian one, similar patterns would have been discernible. To this date, some people live in this region primarily as foragers. The fuel-wood collecting communities form an example. Thus, though taking place in a relatively short time scale, the transition seems to be enormous.

6.3 Whether Reality Itself in the Ajoy River Basin is a Social Construct

I approach this issue through the prism of floods in the river basin. A flood is a natural event in a river system. Most rivers flood when there is excess water in the channel. However, the excess water can be caused by entirely natural processes like a cloudburst, excessive rains or snowmelt; a combination of natural and human actions like rains and the release of water from large reservoirs; or

solely by human actions like flooding a channel by releasing water from dams. As almost all rivers in the world today have undergone morphological and hydrological changes due to anthropogenic impact, building up for millennia and accelerating remarkably in the last century or so, it is probably justified to say that in most cases big floods occur because of a combination of natural and human actions. The anthropogenic changes may not involve the river system directly. These changes may be in the form of a galloping increase in the greenhouse gases that cause the atmosphere to warm up, melting snow in the mountains and generating intense thunderstorms, or pumping more energy into mega climatic patters like the Monsoon in India (Lynas, 2006). In the case of the Ajoy River floods, as we have seen, they are caused by a combination of excess rainfall in the catchment areas of the Ajoy and its tributaries, a change in the river's path in the past, and the release of huge volumes of water from the Hinglo dam located upstream, on one of the river's major tributaries. It is also true that floods assume different dimensions according to the socioeconomic condition of the societies affected by them. In 1978, the floods killed many more people than they did in 2000, though property damage in the 2000 flood is said to have been more extensive. This is due to the fact that in 1978, India was more rural: there were

less routes of escaping the fury of the river, and the communication system was poor. In comparison, people could flee the raging river in 2000 due to better rail and road links. The houses in many villages were better built (in bigger villages like Rajatpur, that is) and the communications system was much better. As Mukhopadhyay et al. (2005) note, floods have been recurrent phenomena in this landscape, but it is relatively recently that they are labeled as ‘disasters’, which again is because of the state of the society in the landscape in recent times. This imparts a social component to the phenomenon called flooding. On another level, I heard that villagers living close by the river categorize flooding into ‘regular’ and ‘catastrophic’ floods. Regular floods, to them mean loss of cultivable land due to an increase in the river water (which often lies inside the river channel), erosion of the earthen road that connects their villages due to heavy rains, or a rise in the river’s water level and so on. These events are not termed ‘floods’ by the urbanites and urban experts, but they nonetheless appear so to the villagers who live in the landscape. Thus, though claims of flooding affecting the Mangalpur village might be unreal to the planner sitting in an air-conditioned office in Kolkata, because he cannot find any corroboration in the satellite images, it is potently real for the villagers who lose their crops due to a small rise in water levels. We have also

seen how the dam is implicated or absolved from the charge made by people in different social conditions of having caused floods. No one with whom I spoke knew exactly what volumes of water were released from the dam, to what extent that water caused the massive flood wave that drowned the villages, and why there were spatial differences in the volume of water coming in the flood wave. If there are any records, they are most probably being eaten away by moisture and bugs affecting the piles of yellow pages in Satkahonia water monitoring station. Yet people freely speculated on the dam's role or its innocence as far as the floods were concerned. This shows how social identities allow people to 'construct' realities, which they are convinced are 'real'. Thus the bias in the vision is not only present in the observer's view of the landscape, it is present in the subjective view of the dwellers of the landscape as well and constitutes a key feature of the social landscape of any given region.

From all this, it can be argued that social landscapes have layers of meanings in them, which exist because of different relationships that different communities enjoy with nature in that landscape, and nothing is completely real, for reality itself is a social construct here.

6.4 Making Sense of It All

To synthesize the data that hint at a patchwork of many conflicting and complimentary patterns is a challenging task without doubt. However, if one looks at what a synthesis may look like, one can simply take a look at the landscape in question. The landscape in the Ajoy River basin near Bolpur is the living testimony of how deeply dichotomous trends coexist and constitute a dynamic whole in a given landscape. Being a researcher in social science, my job was to look at the main components and processes in that landscape and try to analyze them so that a causal explanation of why and how the landscape is changing by the day can be found. The data I gathered from my fieldwork suggest that a landscape is a process in itself. Natural components in the landscape act as a process, and so do the human components. These processes in turn, are parts of bigger, nation wide, even global processes like urbanization and globalization, which are terms of fairly recent origin, but which mark the continuing transition in man's relationship with nature. At present, this relationship is undergoing a phase where people are becoming more urban in general, meaning they are living in concentrations of habitats called cities or towns even as they continue acquiring resources to sustain them from the wild or from the areas that are termed 'rural.'

The ecological footprint of urban areas are disproportionately bigger compared with their physical sizes, and these footprints have been changing the ecosystems of lands which until recently did not see any cities or had no urban habitations at all. India, the second largest country in terms of population, was a primarily agrarian nation. The Bengal basin, especially, was known for its agricultural production. The Ajoy basin is only one example of how places in that primarily agrarian area are suddenly undergoing a rapid transition, and how such transitions benefit some while disentitling some other communities. It was also seen how specific events can have a multitude of meanings and how they can be socially constructed. Lastly, it needs be pointed out once more that continuity and transitions can be seen as two faces of the same coin: together they represent not something abstract, but something as vividly real as a physical landscape.

CHAPTER 7: CONCLUSIONS AND RECOMMENDATIONS

You begin, where I end.
Beginning and End, thus, are intertwined in You and Me.
Rabindranath Tagore (Translated by me)[9]

Over the last six chapters, I have tried to present a picture of a landscape. I borrowed the techniques of painting that picture from some noted scholars. I undertook a journey to study the subject which I was going to paint, and I immersed myself in the atmosphere that I was trying to catch in the portrayal, through talking with its components, and sometimes taking refuge in modern technology to freeze a moment in that atmosphere in my camera. This chapter is devoted to giving the final touches to that portrayal, and to suggesting to what extent the portrait is a limited version of the dynamic whole it tries to capture.

7.1 Conclusion: In Response to Research Question 1

The relationship that the bank dwellers has with the river is of direct sustenance. They are mostly subsistence farmers and foragers. Some of them, mostly able bodied men of a relatively young age, are involved in working in the construction industries in the cities. Consequently, the river, in many ways, is the source of their identity. They are known in the cities as ‘bank dwellers of Ajoy’

and are identifiable in case of calamities like floods through the same name. Many of them are refugees from what is now Bangladesh and came to West Bengal when the country was partitioned in 1947. They are still politically marginalized as a result. The river offered them means and places to settle down and thus their existence and identity both are dependent on the river in a direct manner. The subsistence farmers farm in the fertile tracts of land that lie in the floodplain of the Ajoy. The area farther away from the floodplain is less fertile and as these farmers do not have much technological sophistication at their disposal, they cling on to existence by the river. This choice of theirs is a double edged sword. In normal times, they can reap four crops a year and as their farming technique does not involve chemicals, they can sustain that practice for years on the same strip of land. However, when the river rises or when there is a flood, these people are hit almost immediately. As they have no survival package that allow their families to settle down in the surrounding cities (in the absence of any special skills that can benefit them in the face of competition with other migrants), they cannot flee the land when hit by floods. Thus their fate as a society is linked with the fate of the river. Here I choose to say ‘fate of the river’, because the floods are not entirely dependent on the moods of nature. A strong correlation with water release from

the dam upstream is suggested by the data. Thus, the river Ajoy is being changed by anthropogenic activities, which in turn, affect the bank dwellers' societies.

7.2 Conclusion: In Response to Research Question 2

The bank dwellers perceive the river as a source of their sustenance even today. However, there are ways in which the nature of that sustenance has changed. In earlier times, the river water used to be potable. It is no longer so. This is due to the pollution of the riverwater, from industrial sources upstream as well as from washing animals, defecating, and contaminating it with general filth all along the course. However, it can be argued that Ajoy still is the principal provider of the potable water in the region for the ponds and the groundwater tables are replenished by this river system. On the surface of it, though, the dependence on the river for potable water purposes has declined dramatically and has even evaporated completely. The bank dwelling villagers see the river as the main source for the farming water nevertheless. However, the perception of the river in the eyes of the bank dwellers is a composite process in itself. It involves both the vision that they get in the process of being closely related with the river, as well as the vision imposed by the urban centers located some distance apart. It is often the latter vision that holds sway today. As was clear from the schoolboy's

words in the village of Keshermath, the young generation in the area aspires to become more urban and they do not see the river as the defining factor in their future lives. Whether this generation will be disillusioned with their urban aspirations, only the future can tell. But a significant transition is thus underway in the societies that are directly sustained by the river because of the rapid urbanization in the surrounding landscape. This transition erodes the river's position in the perception of the bank dwellers and the erosion of this position will most probably lead to more pollution of the river and an even more adverse environmental impact on the local ecosystem which has already suffered greatly because of the urban resource hunger and the consequent denudation of the landscape of its vegetation cover. The sense that the river binds these subsistence farming villages together is still strong today, but as the villagers look expectantly for urban authorities to provide relief in times of crisis, it can be predicted that such awareness will only grow weaker in future.

With respect to the floods, most villagers implicitly indicated a rapid transformation in the river's morphological and hydrological characteristics. Most replied that the river is more silted, wider, and shallower now than in any time in the past. In years of excessive rainfall, such changes in the river regime most

probably have combined to make modern floods in the river basin more devastating than floods in historical times, even as the dam upstream has reduced the frequency of the floods. The same dam has been implicated time and again in the two most massive floods in living memory. Most identified floods as destructive; perhaps even more so with their reduced frequency and increased intensity. If the floods had continued to be a normal feature of the landscape, the chances are that their impact as destructive events upon the perceptions of the bank dwellers and the rest of local society would not have been as significant as it is now. The reduced intensity of the floods means that the bank dwellers have become oblivious of the danger of living by the river, and when sudden floods sweep everything away, the result is a profound shock. This shock then reverberates through the surrounding habitats – rural, semi urban and fully urban – and gives rise to the concern that floods must be checked at any cost. Though floods are disruptive events, they are actually natural features of a river system and their role in replenishing the floodplain cannot be ignored. In recent times, the sole focus has been on how floods can be checked, not how societies can live with floods. This has resulted in a lot of debates and plans but ultimately little progress for the societies along the riverbank. They simply do not have anywhere to go and

so they are continually affected by floods.

7.3 Conclusion: In Response to Research Question 3

Awareness of how precisely man made changes affect the river system is not high among the bank dwellers. This is due to the fact that the level of education in these societies is low. The villagers know a great deal about the natural features of the land and about the climatic variations, and they even possess ingenuous crop growing techniques that can be seen as particularly sustainable to the fertile floodplains. These have been their assets for living in this land for years. However, suddenly, as the landscape undergoes a transition, the continuity of the efficacy of these assets is facing a question mark. This is because anthropogenic interference in the river regime is changing the whole river system and consequently, the ecosystem that exists in the river basin. The once effective survival traits are proving less and less effective by the day, as work like selling sand to construction companies in cities is bringing much more monetary benefit than farming nowadays. This change, as noted quite a few times in this research, is imposed by the necessities of the urban areas upon the rural landscape, but its power cannot be ignored. The result is a depletion of the cultural variety in the

local societies and loss of traditional knowledge like indigenous farming practices.

The bank dwellers, it can be observed, are involved in this process themselves. They are trying to cope with the new realities manifested by the growth of urbanization and globalization. The place that they knew as theirs is steadily being encroached upon by roads, rail tracks and other networks crisscrossing it. All these act in a joint manner to bring the cities closer to this landscape, to connect it with urban industries that seek to exploit it for economic growth and their survival. The bank dwellers, right now, are caught in the middle. They cannot abandon their standard livelihood practices, yet they are witnessing the growing inefficacy of the same. Today, their existence faces a question mark unless they change and adapt to the changing realities. In earlier times, when people settled this landscape, they were probably required to change their habits too, due to the peculiarities in the landscape. But today, they are not being changed by something that emanates from within the landscape, but something that comes from the outside. The Ajoy basin is not an isolated pocket of land that can be immune from the currents of change that are shaping and reshaping landscapes worldwide. In this regard, the tale of this river basin offers a

fascinating example of how transformation and continuity shape landscapes and human perceptions of them.

7.4 Recommendations

This study is the result of intensive fieldwork in the Ajoy River basin in West Bengal in India. Due to the limitation of funds and the time available to me, it was limited in its spatial and temporal extent. The Bengal basin, once a main granary of the nation, but now afflicted with ailments like widespread river pollution, resource depletion and diseases in both rural and urban communities like arsenic poisoning, offers many different examples of how socioeconomic and sociopolitical transitions affect both natural and human worlds, which are intertwined with each other in the first place. The following recommendations are made for future research in this area, containing the Ajoy basin and beyond:

1. A study of how many times the river had changed its path in the past and how societies coped with the resulting floods would be very useful in the sense that it would be able to capture a much more holistic picture of the social dimensions of natural changes in a river system.
2. Precise water release figures from the Hinglo Dam Commissioning Authority,

which is under the Commissioning Authority of another river, the Damodar (there is no controlling authority division on the Ajoy) would help ascertain much more clearly how upstream dams contribute to river system changes that have led to devastating floods in non-perennial rivers like the Ajoy which are prone to siltation, and whether the dam-induced changes in the river regime have resulted in the river shifting its course.

3. Records of the state irrigation department regarding the causation of floods, their extent and life and property damages are also vitally important, if any meaningful planning of flood management is to be attempted in this river basin or in similar river basins. Equally important are surveys of the lifestyle changes after a catastrophic flood and giving voice to those who have suffered from one. This calls for large scale state and non governmental mobilization so that inquiries are conducted in an impartial manner. The mandate of the inquiry commissions should actually empower them to suggest how to seek alternative measures to lessen the flood impact in these societies, by giving them larger financial packages more quickly. There should also be more careful overseeing of how much water is released from the dam, and measures to ensure that adequate prior warnings are issued in such cases.

4. More research is needed to appreciate the cultural variety in the bank dwellers' societies and to understand how they can live with floods. Sole concentration on abolishing floods is likely to be detrimental for the river system's health. Alternative measures are needed whereby societies can continue to live and generate income to sustain themselves even when floods happen.
5. If the steadily dwindling vegetation cover in the river basin is any indication, it seems to be that with rapid urbanization, a hugely precious biodiversity pool and indigenous knowledge about it have already been lost. Much more extensive research work is needed to fully understand not only what we have already lost, but also to understand what we stand to lose from now on, and how we can avoid losing such precious resources that make our existence on this planet possible.

ENDNOTES

1. Excerpts from *To the Grashopper and Cricket* by John Keats, from : http://poetry.poetryx.com/poems/336/
2. *Ajoy* is also spelt as *Ajay.*
3. Albert Einstein. Quoted In: http://www.jainworld.com/society/jainevents/GJE2003/jain%20temple%20in%20india%20and%20around%20the%20world.htm
4. See 2
5. *Ilambazaar* is also spelt as *Illambazar* or *Ilambazar*
6. *Bardhaman* is also spelt as *Burdwan* or *Bardhamman*
7. Quote of Gautama Buddha translated in English. http://corporate.skynet.be/zen/one.htm
8. Jared Diamond, In *Guns, Germs and Steel: The Fates of Human Societies*
9. Line of a Bengali song by Tagore, translated in English.

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