Forces of Disenchantment:
The Role of Ideational Change in Models of Environmental Degradation

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ABSTRACT

In order to extend existing models of anthropogenic influence on the natural environment, we test whether the narratives of village farmers in the Chitwan Valley of Nepal map onto the commonly used I = P×A×T formula of Erlich and Erlich (1991). Further we explore how the inclusion of cultural or ideational forces could be used to enhance this conceptual model. Our findings and conclusions come from the analysis of transcripts from 12 focus groups conducted with 30-60 year old farmers (both men and women) who live in the Chitwan Valley of Nepal. In addition to building and revising theory around human influence on the environment, this paper informs policy by modeling how local culture and beliefs can be considered in the tailoring of programs designed to minimize environmental degradation.

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A common framework for understanding the forces that influence eco-destruction across a wide variety of settings is that which sees environmental impacts (*I*) as primarily the product function of three variables: *population (P)*, *affluence (A)*, and *technology(T)*, or $I = P \times A \times T$ (Erhlich & Erhlich 1991). While not without its critics (c. f., Dietz and Rosa 1994), a great deal of research has shown this model to go a long way in explaining pollution, loss of diversity, and natural resource depletion (Hempel 1997). This type of model is well suited for finding commonalities across settings in the structural forces shaping eco-destruction. However, the $I = P \times A \times T$ model is a framework that has primarily been developed from the outside in, or the top down, meaning we have little evidence comparing this conceptual model created by researchers and the schema that humans have regarding the physical environment with which they interact. By studying how humans describe the environmental problems they face and potential causes and consequences, we can enhance our understanding of how local environmental conditions, cultural contexts, and policy factor into a larger model of environmental degredation.

Related to the need to explore how humans themselves understand environmental change, one critique of the larger $I = P \times A \times T$ model is the lack of consideration of how cultural or ideational forces condition relationships between people and their environment (Van Wey, Ostrom, and Meretsky 2005). Durham (1992) has argued that the general formula be expanded to include ideational factors as a fourth variable that interacts with population, affluence, and technology to influence levels of environmental degradation. In other words, it is likely that cultural values and other ideational forces condition the influence of population, affluence, and technology on each other as well as the environment.

One way to develop nomothetic explanations of the role of culture and ideation in human-environment interactions that revise the $I = P \times A \times T$ model, is to start from case studies or an

idiographic approach. Findings from rich, in-depth studies in one setting can then be used to build theory for the ways in which ideational forces condition the influence of structural forces on environmental quality. Eventually, these findings can be compared to other settings and then tested across a variety of settings.

In this paper, we take an idiographic, in-depth focus on farmers in one of Nepal's most active agricultural areas and their narratives of social change (such as population growth and decline, the spread of western education, and the introduction of modern agricultural methods), environmental change, and relationships between the two. We are thus able to evaluate how their larger conceptualization of the forces at work to influence the environment match the $I = P \times A \times T$ model. In addition, we evaluate the role of cultural and ideational factors in these processes. In doing so, we uncover evidence of two ideological processes, the shaming of local actors and the disenchantment of nature over time, that strip communities of the motivation and cultural schema to innovate to protect the local natural environment.

We provide detailed analysis of these processes in the Chitwan Valley of Nepal, but also use this evidence to build theory that could be transferred to other settings for additional testing. These advances in understanding the role of cultural or ideational change in the relationship between humans and their environments also informs policy makers of the implications of implementing seemingly global values regarding social and environmental change to specific corners of the world.

RESEARCH QUESTIONS

(1) How do the perceptions Nepali farmers have of environmental problems, sources of these problems, and potential solutions for these problems map onto the $I = P \times A \times T$ model ?

(2) In what ways do the narratives of Nepali farmers about environmental problems, sources of these problems, and potential solutions for these problems reveal cultural or ideational influence within a larger model of the causes of eco-destruction?

SETTING

The Chitwan Valley, located in south-central Nepal, is 450 feet above sea level, and about 100 miles from Kathmandu, the capital of Nepal . The valley, which is a region in the low-lying plains, was mostly uninhabited (except for a few indigenous hunter-gatherer tribes) and uncultivated up until the end of the 1950s (Ghimire 1992; Ghimire et al. 2006; Axinn and Yabiku 2001). At the end of the decade, along with assistance from the United States Agency for International Development (USAID), the Nepalese government launched the Rapti Valley Land Development Project to eliminate malaria and to clear parts of the jungle to establish settlements and farming land (Yabiku 2005; Shivakoti et al. 1999). Already, by the end of 1960s, the Chitwan Valley had attracted a huge influx of immigrants from the surrounding hilly areas and what had once been uninhabitable jungle soon became fertile farmland (Guneratne 1996; KC and Suwal 1993).

Many of the inhabitants of the valley are almost completely reliant on successful field cropping for their survival and the forest is a significant source of resources such as firewood, timber, fodder and thatch (Matthews et al. 2000; Shrestha and Bhandari 2007). In the recent past the region has faced several natural calamities ranging from floods to droughts. Also due to the ever increasing demand for new housing and new diseases seen in crops, agricultural production too has declined. Given all these stark situations, urgent research needs to be done to study the negative impact of loss of flora diversity on the fauna and human populations in the valley (Matthews et al. 2000).

One of the main agricultural institutions is also located in the valley. This makes it convenient for researchers to study the dynamics between the ever increasing population and the natural

environment. According to Matthews et al. (2000), the population in the valley doubled between 1971 and 1991, with an annual growth rate of 3.3 percent. Although the government has introduced several programs and policies for environmental conservation, the forest is under constant pressure and in a state of gradual decline due to the loss of forest and increasing non-farming activities (Shrestha and Bhandari 2007).

The Chitwan Valley is an ideal setting to study the different models of environmental degradation because of the large social and environmental changes that have taken place over the last 60 years in the region. With the region's connection to the rest of the country through major highways during the 1970s, groups of individuals from "a variety of religions and ethnic groups, which differ widely on a range of attitudes, beliefs, and behaviors, came to inhabit the region" (Beutel and Axinn p.114, 2002). Over the last six decades there have been substantial expansions of schools, markets, transportation, health services and employment opportunities in the valley (Ghimire et al. 2006; Shivakoti et al. 1997). Also, given the proximity of the region to the borders of Uttar Pradesh and Bihar in India, and also the many shared characteristics with populations from eastern Pakistan, western Bangladesh and northern India, the findings from this study might shed light upon the rapid changes occurring in these other parts of South Asia (Yabiku 2005).

DATA AND METHODS

The data we use for the analyses of this paper come from 12 focus groups conducted in the summer of 2010 with men and women who live in farming households in the Chitwan Valley of south central Nepal. We selected the focus group method for its less structured nature and its group dynamic. Because we wanted to take an inductive approach and let the larger conceptual model that local residents have about relationships between population, affluence, technology and the environment emerge out of their descriptions, we chose a less structured method. We wanted to hear individuals' voices and

narratives regarding these matters. In addition, we wanted to ascertain the shared meaning of these processes, and learn from the conversations that neighbors have with each other regarding environmental perceptions and the causes and consequences of environmental degradation. This is why we selected the focus group method over individual, semi-structured interviews.

Our 12 focus groups took place in six different villages and focus groups were conducted separately for men and women in each village. We conducted separate focus groups by gender, because generally women in Nepal feel freer to speak their mind when men are not also involved in the conversation. Second, when it comes to interaction with the natural environment, men's and women's tasks vary a great deal. Men are primarily responsible for tasks like plowing or cutting firewood while women's tasks include caring for livestock and collecting fodder. Therefore, it is likely that women will discuss different aspects of the environment and related factors than men.

We relied on local informants in the Chitwan Valley to recommend six villages at different locations throughout the valley that would provide some variation in distance to the jungle, access to water sources, and caste and ethnicity. We in no way claim that this makes our findings representative of all farmers in the Chitwan Valley, but we do argue that this variance in informants exposes us to a wider range of experiences in the valley, allowing us to check our ideas across different settings in the same area for transferability[1] (Morgan 2007). We only selected villages in which the majority of residents are farmers, so we did not select from the handful of small market villages spread along the roads of the valley. We did this because we were primarily interested in hearing from people whose direct livelihoods are connected to the land, and who directly interact with nature day in and day out.

Once the villages were identified, we went in person to meet adults who lived in the villages, described our project, and asked to be referred to any residents who were between the ages of about 30 and 60. Upon meeting these eligible participants, we described our project and following our IRB

[1] Transferability, unlike generalizability, does not claim one's findings are fully reproducible, just that knowledge gained in one setting can be transferred to another setting to help in conceptualization and evaluation.

approved protocol, asked if they would be willing to participate in a focus group. All adults with whom we spoke agreed to participate. We would then make an appointment for later in that week and visit to conduct the focus groups.

The focus groups were conducted in semi-private space, out of earshot from non-participants, places such as a yard, a front porch, or an empty chicken coop on straw mats and benches. We followed a semi-structured interview guide written in Nepali, to guide the discussion, but allowed flexibility in the order of questions asked and spontaneity in the inclusion of new and emergent follow-up questions. The interview guide is provided here as Appendix A. All three authors were present for the focus groups, and the one native Nepali speaker among us served as moderator for 10 of the 12 focus groups. We also had one interview assistant from a local research organization who facilitated our introduction to these villages and helped run the focus groups. The demographic characteristics of the various focus groups are displayed in Table 1.

[Table 1 about here]

Upon receiving approval, we audio-recorded all 12 focus groups. The transcripts were then transcribed into Nepali by hand, translated into English, and typed. Multiple checks were performed along the way to make sure all transcription and translation was accurate. The resulting set of transcripts has been uploaded to an online qualitative software analysis web application called Dedoose.com.

Our coding began with a phase of open coding for recurrent themes. We then decided on a code list based on concepts taken from relevant theory and prior research (e.g., impact, population, affluence, and technology) and added codes for concepts that emerged as important during the open coding phase (e.g., shame, religion, medicinal herbs, etc…). Once the code list was finalized, we systematically coded every transcript for each code in the code list. Coding of data from three transcripts was subjected to interrater reliability analyses. For these three transcripts, coding from three

independent coders was compared to validate the reliability of coding decisions among team members. Levels of interrater agreement were found to be acceptable, with an average Cohen's Kappa statistic for interrater reliability of .85, and ranging from .85 to .86. The other nine transcripts were subsequently coded by at least one of the trained coders with occasional checks to ensure that acceptable levels of coding reliability were maintained. With the codes in place, we began relational analyses to reveal patterns in the narratives of these farmers as described below.

RESULTS

Aspects of the I = P x A x T Model Reflected

In general, a fair amount of the *I = P x A x T* model is present in the discourse of Nepalese farmers. We will first briefly discuss the environmental impacts most commonly cited by the farmers, and then we turn to describing the ways in which population, affluence, and technology (as well as interactions between them) are discussed.

The most commonly raised problems with the natural environment, or the "impacts" on the environment observed by famers in Chitwan, are lack of sufficient water for irrigation and home use (partly described as climate change and partly described as human overuse of underground water supply), pollution cause by human defecation along roads and in the fields, deforestation, soil quality hampered by overuse of chemical fertilizers, air and water pollution caused by factories, and the litter created by plastic bags and bottles. Below we illustrate how farmers describe these impacts, their causes, and their consequences.

Population. In explaining various sources of environmental degradation, our interview participants frequently refer to population growth. By far the most common narrative was that of how the growing population size leads to less land per family or person and a depletion of natural resources used in everyday survival (e.g., wood for cooking food, fodder for feeding animals, and agricultural

intensification which leads to decreases in biodiversity and overall crop production). Here are some examples of how the farmers talk about these things.

> We have a big family. We have to be able to feed everyone. The population has increased. Land has decreased. The price of land has sky rocketed. Those who are able to earn money buy land, those who are not able to earn can't buy. Because of inadequate land we plant hybrid crops and so they get infested. We have to grow a lot.
>
> (One woman in Gunjanagar)

> The population is increasing. More people need more. If one *bigha* (a unit of measurement for land equal to 20 *katha*) is divided among twenty children, they get one *katha*. If again, one *katha* is divided among 20 children, and they get one *Dhuri*. So, the one who gets one *dhuri* is affected. They can neither build a house nor can they grow enough crops. This is the problem we are facing.
>
> I agree, population increase is definitely one reason for the environmental destruction.
>
> Population increase is the main thing. There is little land. The land is constant, but the population is increasing. I have seen such a problem.
>
> (Three men in Paanjana)

> In the past, people used to have plenty of land, and the population was smaller then too, but nowadays people don't have such a huge amount of land. Those people, who used to have 5-7 *bigha* and were landlords in the past, their generations now have only 10 *kattha* due to multigenerational families splitting apart.
>
> (Another man in Paanjana)

> Previously, much land could be used for grazing cattle but there is dense human settlement today. The remaining land is occupied by community forests. Because of lack of fodder and places to graze, it is difficult to raise cattle these days.
>
> (Man in Meghauli)

***Affluence*.** Affluence is an aspect of the *I = P x A x T* model that is debated. In this model it is meant to represent consumption levels. In other words, it is assumed that more wealth leads to more consumption of natural resources (Erlich and Erlich 1990). An alternate model of human-environment interactions developed by Grant (1994) to primarily fit developing country contexts, and called the PPE

model , focuses on how population growth and poverty reinforce each other and are amplified by political instabilities. Therefore, these two general models disagree on whether poverty or affluence is the most important economic factor in a larger model of eco-destruction (Van Wey et al. 2005).

Discussion related to affluence and/or poverty in the focus group interviews was primarily about poverty having deleterious effects. However, there was some evidence of perceived negative effects of affluence. Most often the down side of affluence was the rapid increase in plastic material becoming available. Plastic bags are used to carry purchases from the market, and plastic bottles hold water, juice, and soda for purchase. As there is no organized waste disposal system outside the urban area of the valley, the problem of disposing of plastics has become very visible. Here is what several individuals had to say about plastics during our interviews:

> The plastic mineral water bottles we buy from the market, we throw them away. The glass bottles, we keep to store water and milk, but in the end we dispose of those as well.
>
> (A woman in Hirapur)

> Plastic materials are a great problem. Everyone takes plastic bags while coming from the market. They are scattered everywhere in the house.
>
> (A woman in Meghauli)

> A: We obtain plastic bags and bottles while shopping in the bazaar. They do not burn completely in our rubbish fires. There are remains of plastic and it destroys the land.
> B: As it is not decayed, it poses a problem today.
> C: It has badly affected the plants.
>
> (Meghauli men)

These individuals reflect the overwhelming agreement in all the interviews that plastics are becoming an overwhelming problem in the villages of the Chitwan Valley. With no recycling options (except reuse which will end in waste at some point), people are left with few options. Some try to burn the plastic with some success, but byproducts are left and the fumes are disturbing. Others throw the plastics on the side of the road, in forests, or in the river. Litter is very visible throughout the valley. There is much discussion of the issue, but none of our focus group participants mentioned any potential solutions

being proposed or discussed. If blame was laid, it was directed towards shop owners for providing such materials. Further, no mention was made of the pollution involved in the production of these plastic materials in the first place. That is, of course, less visible to these farmers, but as is apparent relevant to other topics in the interview, the locally observable environment and their interaction with it is the only topic matter raised in these focus groups. There is little attention to the larger region or world's responsibility towards climate change, water and air pollution, etc…

The other side of affluence is poverty, and as discussed above, many have argued that poverty may also drive eco-destruction (or that sometimes wealth leads to technological advancements that allow for minimizing impact on the environment—e.g., more productive agricultural techniques). When it comes to money, the farmers we interviewed overwhelmingly attributed environmental degradation to poverty. They expressed strong belief that money could solve many of their environmental problems. First, we heard several discussions about how having financial resources means you can buy means to cook in your home without having to cut down trees for fuelwood. As one participant put it,

> Now, there are concrete houses with gas stoves, heaters, rice cookers. Therefore, not many people go to jungle. Some houses which are made of straw, those people go to the jungle. Not everybody goes to the jungle to collect fuelwood and fodder these days.
> (one woman in Laukhari)

This woman is describing how concrete homes and cooking implements purchased from the market prevent local people from collecting house making materials or fuelwood from area forests. We heard this repeatedly in the interviews.

Because water shortages afflict many in this region, economic resources were often cited as a necessity for environmentally responsible agriculture. Water is necessary to keep soil fertile. Only the relatively well off farmers are able to purchase electric pump wells which allow them easier and more regular access to an irrigation source. One woman from River Bend said,

> Those who are financially able have boring well systems (electric pumps). Others, they just depend on rainfall. They wait for the rain. If it rains they can farm, otherwise not.

Several focus groups mentioned that having economic resources would allow them to put community water systems in place and manage them in a way that everyone would have the water they need. Currently it is a situation much like that described in *A Tragedy of the Commons*. Whoever can dig their wells deeper and faster can use up the most water. This shows a misuse of affluence that is detrimental to the environment, but for the most part, these farmers believe that if funds became available they could buy innovations and systems that would help them all manage in an ecologically responsible fashion.

There is one more main way in which discussions of poverty surfaced during our interviews. That is the overwhelming assumption that poor people do not possess the education and therefore abilities necessary to advocate for policies and programs that would limit eco-destruction. As one man in New Village put it,

> Those who seem to do something about our problems are the same ones who move to foreign countries for school and work. Those who are capable go abroad and only the poor and uneducated people live here. So plans, policies, and vision are lacking here.
> (man in Naya Basti)

It does seem plausible that an ability to self-motivate, work hard, lead others, and navigate the intricacies of a political hierarchy are personal qualities that both improve one's chances of succeeding at school and are skills that are enhanced through the education process. It is also true that many young people who have achieved an education are able to pursue further education and work opportunities outside Nepal. However, it could also be that the negativity directed toward the poor and uneducated is overly harsh and strips them of their agency. This is a point we further develop in the section on ideational factors below.

In sum, for the most part, farmers in the Chitwan Valley tell us that they see affluence as making available resources to address many of their environmental problems. They do not make the causal link themselves about how those with more economic resources will buy more plastics and thus it is the better off residents who produce more plastic waste, but they do recognize that plastic materials

purchased in the markets with available cash is contributing to a large environmental problem. So, in this setting we see examples of both poverty and wealth cited in the destruction of natural resources. This suggests that as governments and aid agencies want to increasingly address environmental quality issues, they should think both about the benefits and challenges of affluence and work to address poverty at the same time.

Technology. Closely connected to the ways in which affluence and poverty influence the natural environment is technology. Often technology requires capital to get going, and technology can produce wealth. And, like affluence, technology can have positive and negative effects on the environment. When technology is harnessed to improve environmental conditions it is seen as a positive, yet certain technologies are very polluting. The farmers in the Chitwan Valley, primarily talk about technology that harms the environment, but occasionally, technologies that serve to improve the environment come up as well.

While there are no large factories within the bounds of the valley in which we chose our sample, there are a beer bottling and a paper making plant across one of the rivers. There are also a few factories in neighboring districts. Our participants were quick to point to these factories as a local source of air and water pollution.

> (A) The waste materials which are disposed from the factories are thrown into the rivers which ultimately pollute the environment.
> (B) Development and destruction go together. Scientists have developed big machines which definitely affect the environment. There are factories in which machines are widely used and the smoke and dust emitted from the machines are harmful for the environment.
>
> (Women in Crossroads Village)

They are also quick to connect these factories to advances in science and technology. This woman goes so far as to call factories "scientific miracles."

> Scientific miracles are happening. New factories are emerging. New industries are operating. The environment has been polluted because of that. The smoke and waste from these factories, take for example the paper industry in [name of another village].

> It's very nice out here compared to what it's like in that place. You can't even dry your clothes outside in that place because of the smoke from the paper factory. And, in along the nearby river, the flattened rice mills are polluting because of the smoke and dust they produce. The dust and smoke get all over the place, on your clothes, your rooms, on your food, it's everywhere. We don't have factories like that around here, but where there are factories, the area is polluted.
>
> (Woman in Place of Flowers)

It seems that although factories are considered a sign of economic progress and a source of jobs to some, those who do not benefit from them or live nearby are not motivated to have good perceptions of them. The farmers we interviewed never once clarified their remarks with the notion that factories also have societal benefits. They did offer more nuanced discussion of another technological advance that damages the environment, chemical pesticides and fertilizers.

An overwhelming sentiment in our focus group interviews was that there is much strain on farmers to produce enough food to break even in a given year. The ongoing drought combined with reported increases in pests seems to put farmers in a vicious cycle where they are applying more and more chemical fertilizers and pesticides to coax along enough crops. Unfortunately, part of this cycle is that the chemicals are detrimental to the soil and make it less and less productive. Farmers recognize this in their discourse about the challenges of farming, but it seems that the here and now is most relevant to them and therefore driving their interactions with the environment. They need crops to go to make a living now. They are not thinking so much about the future. They are putting the technological advances in fertilizers, pesticides, and pest-prone hybrid crops to use all the while recognizing they do long term harm.

> Even if it does rain on time we have to use chemical fertilizers. The quality of the land degrades because of the chemical fertilizers. And also it's getting harder to find manure; people have stopped rearing cattle/livestock and because of that we have some problems with farming.
>
> There are new hybrid species now. We have hybrids for corn and rice and the hybrid crops are very prone to becoming infested. We need to use a lot of manure. It doesn't matter if we use seeds or grains, when the time comes to geminate we have to use the pesticides and then again when we're replanting the rice. And when we're done

> planting too, the rice gets infested. We have to spray pesticides several times while the rice is growing. And, once the rice is harvested, we have to use pesticides again before we can put it in storage. There are a lot of pests.
>
> (Man in Place of Flowers)

As a side note, the decline in manure (or livestock) is attributed to land and fodder shortages due to population pressure and loss of labor to care for animals, because children now attend school more often and for more years of their life.

As we mentioned at the start, there is some recognition by farmers of the role technology can play in curbing certain environmental problems. One group of farmers told us the success they were having keeping rhinos, deer, and other animals from the national park out of their fields by using electric fences.

> Up until two years ago, the wildlife from the national park used to destroy about ¾ of our crops. At that time, two years ago, we installed an electric fence around our village and fields. Then the wildlife no longer came and destroyed our crops. (*Interviewer: The animals never get inside the fence?*) Sometimes there is a mistake, the wire is disconnected or it is broken during a flood, then the animals might come in, but for eight to ten years, we have had no problem.
>
> (Man in Windy Place)

Also, even though farmers do acknowledge that electric pump wells have led to depletion of the underground water table, they also speak of these motorized pumps as ways to address the lack of rainwater that is likely a result of climate change.

> We have dug wells and we use motors to pull water up to the ground and that has helped us with our farming.
>
> (Man in Place of Shiva)

All in all, farmers in the Chitwan Valley weave a complicated story of technology, similarly complicated to the story of affluence/poverty. Sometimes technology seems to help, sometimes it hurts. Even the same technology (e.g., motorized pumps) can both aid and harm the environment. When push comes to shove, the farmers lean towards accepting the benefits of affluence and technology and discussing but rarely working to address the negatives. We argue below that this is

partly due to ideological changes being spurred on by the spread of *developmental idealism*-- ideas that societal development through mass education and the adoption of other western institutions and ways of life are preferable to indigenous practices and customs (Thornton 2005).

Incorporating Ideological Factors

Because most general models of human-environment interactions lack consideration of cultural and ideological factors that will moderate the influence of population growth and distribution, affluence/poverty, and technology on the natural environment, we closely analyzed our focus group transcripts for how various attitudes, values, and preferences (and change therein) relate to various descriptions of human-environment interactions. What we found is the tools used to spread the notion that "modern," "western," ways of life are preferable and the ideas themselves are at play in how farmers understand and interact with the natural environment.

Thornton (2005) argues the set of ideas that modern society is good and attainable are a part of "developmental idealism." The other propositions of developmental idealism are that the modern family is good and attainable, that the modern family is both cause and effect of modern society, and that individuals have the right to be free and equal with social interactions based on consent. Further, he argues that much family change in the last couple of centuries has been driven by these ideas and individuals' and countries' desires to be "modern." We extend this argument to the population and environment arena, arguing that parts of developmental idealism and the mechanisms through which it is disseminated have implications for how humans interact with the environment. Research separate from ours in this same setting has established the pervasiveness of developmental idealism in the Chitwan Valley of Nepal. Residents overwhelming agree that modern society is good and attainable (Thornton, Ghimire, and Mitchell 2004). The mechanisms through which this has likely occurred include increasing mass education, media exposure, and government campaigns emphasizing the need to have

smaller families and invest in children's education (Thornton 2005). The results of this sweeping change for the environment are discussed below.

Introducing Shame. One result of an inundation of messages about the value of education, wealth, and a "modern" lifestyle is that those not fitting these parameters often internalize the messages to mean they are lesser beings. To be sure, not all people or cultures openly accept these ideas (Thornton 2005), but in this particular setting, the farmers of Chitwan Valley largely espouse the values of developmental idealism and use them to criticize themselves and express shame in their backgrounds. For example, at the start of this focus group project, we were collecting demographic information of respondents before the focus groups began. In the first two focus groups, we noticed how embarrassed these men and women were to report no or little education or to report having more than two children. We immediately changed our protocol and collected this information more privately at the end of the interview so as to not increase the stress or burden of participation and to not highlight any type of status hierarchy within the group or relative to us as interviewers (highly educated Americans and Nepalis). After correcting this procedure, the next interesting discovery was that some of the focus group participants in some of the locations were unashamed to tell us that they throw their garbage in the river, forest, or along the roadside. While this immediately triggered surprise for us (highly educated interviewers), the same informants who were highly uncomfortable revealing their education or family size saw nothing unacceptable about this behavior. This highlighted for us the process whereby certain behaviors become chastised.

In some parts of the Chitwan Valley, littering in the natural environment has not become a shameful act monitored like social control. In one particular interview with women who live in Crossroads Village, the transition from an acceptable to a stigmatized behavior is in process and detectable in their discourse and body language.

(A) We collect all the waste and throw it in the jungle. (*Some of the other women start to giggle*)

(B) (*Speaking up urgently as if to repair the reputation of the women*) Waste that is decomposable… we dig a pit and throw it in there.
(C) Most people throw their garbage in plastic bags in the jungle.
(B) People who are ignorant, people who do not understand do that.

In this case (and many others including population control), the shaming of a behavior seems to have a positive outcome. The environment will surely benefit from less litter. However, there are ways in which we discerned a negative impact of the assignment of shame by the outside, educated, "modern" world. Shame can ultimately result in a lack of agency. Here are quotes from other focus groups when we probe about any actions the farmers are taking or they wish they could take to address various environmental issues they have named.

> What to say about it? One who has success in life should lead the society. But here those who are educated, they don't seem to take part actively in such awareness programs. They are educated for themselves. Educated people should lead society. They should offer a vision and go along with it. But such awareness and leadership has not emerged, not even from the educated. This village was established in 2035 BS by clearing the forest. In this place, there are landless people, down-trodden people, and people from the untouchable castes. All of them are backward. Those who achieve something go away to foreign countries. The capable people go abroad, and only the poor and uneducated people live here. So plans, policies, and vision are lacking here.
> (Man in New Village)

> Interviewer: What sorts of things do you think you can do to increase conservation?
> (A) What can we do my child? We can do nothing.
> (B) It is because we can't do anything that the environment is getting worse.
> (C) It is just happening.
> (Women in Laukhari)

> If there are friends to suggest us what to do and what not to do, it will be better. As we are farmers, we have no idea how to conserve the environment. We are all uneducated and hence unemployed; we depend on farming and rearing cattle.
> (Woman in New Village)

In this very last quote, the woman ironically claims that being people that depend on farming and raising cattle, they know nothing about the environment. In fact, they interact daily with the environment and have participated in many cultural and community practices (even if unconscious) that protect the natural environment. Therefore we worry that one unintentional consequence of the push

to valorize developmental idealism is that stewards of the environment—local farmers—will be left or voluntarily dismiss themselves from conversations and programs that would address environmental degredation.

Stripping Nature of the Sacred. At the same time that respect and agency are being taken away from local farmers, the reputation and perception of nature itself suffers in other ways from the forces of developmental idealism. As found in a variety of other settings, religion often plays a powerful role in the perceptions of and interactions with the environment (White 1967). Hinduism is the main religion of Nepal, but many practice Buddhism, and some still practice indigenous religions. All of these religions have been argued to primarily exalt nature through notions that spirits and deities inhabit trees, rocks, forests, rivers, etc… We inquired about this in all of our focus group interviews, and it spurred fond recollections of "how it used to be." Some even still identified with these beliefs, but most told us that those ideas are now considered "backward." Education and science, which are assumed to be quite the opposite of religious beliefs, are preferred meaning systems. Some of the older men and women express regret over the situation, like the following man.

> But modern boys are violating our traditional ways. They pray with shoes and sandals on and offer chickens to gods. They have forgotten the traditions. They don't follow our suggestions. Modern people do not think at all like our ancestors. They prefer modern medicine to medicinal herbs which have a slower effect.
>
> (Man in Crossroads Village)

As mentioned in the above quote, there is also an ongoing transition in this region from the use of medicinal herbs and spiritual healers for common illnesses to the use of Western medicine. A few of our older participants bemoan the ongoing loss of flora diversity that made medicinal herbs widely available, but most are resigned to the change. Related to our discussion above, many feel that progress is worth these costs. One ethnic group in the region, the Tharu, has historically produced indigenous healers (*guraus*) who are educated by other healers (often their fathers or grandfathers) as to all indigenous species and their usefulness in healthcare. As we were repeatedly told in the focus

groups, the current generation of g*uraus* will be the last. We did not hear mention of a single young *gurau* currently being trained.

> Interivewer: Was your father also a g*urau*?
> Participant: No, he wasn't. But my grandfather was.
> Interviewer: What about your son? Is he becoming a *gurau*?
> Participant: No. He is not. The young boys don't learn this. They don't have such interests.
> (Men in Crossroads Village)

Families and youth would be chastised for choosing that vocation rather than pursuing a "modern" education and career.

It seems that part of the package of developmental idealism that is spreading through Chitwan, Nepal (and other places) is that to be "modern" is to eschew religious beliefs and practices perceived as "backward" and that of the uneducated. The unintended consequence of this is that rituals, such as elaborate ceremonies to pray for rain, and sacred healing practices that make use of local plants in a way that promotes replanting and management of the forest are halted, and individuals' perceptions of nature are stripped of the sacred connotations. These sacred connotations served in many ways to protect the natural environment, so when they are removed, nature is seen as a material to benefit humans in their quest to "develop" themselves and their communities.

Interestingly, one could argue that the international environmental movement/s is often paired with other ideologies and movements that are part and parcel of developmental idealism (e.g., social justice movements). Then, we could expect that pro-environment and conservation messages would be disseminated along with all other messages and this could serve the environment. In fact, many of the farmers report that their children come home from school and request that the household build a toilet to clean up the environment, or the children organize a trash pick-up event. Some even discussed textbooks their children have with a chapter on protecting the environment. However, we also heard reports of these same children chastising their parents for being uneducated, so these children then contribute to what we discussed earlier as the shaming of uneducated generations.

CONCLUSIONS

Perceptions of the environment are no doubt complicated, as is any good model of human environment interactions. We find that the components of the *I = P x A x T* model are represented in the discourse of Chitwan Valley farmers regarding the environment and its problems. However, affluence and technology are not always presented as negative factors when it comes to the environment. As the PPE model suggests, poverty can be a detrimental factor and affluence can lead to investments in technologies that will protect the environment. So, technology, often thought of as polluting factories, is not all bad. Technology brings items such as electric fences that protect crops from wildlife damage. This prevents villagers from taking more drastic action against the wildlife.

Another expansion of general models of human-environment interactions has been the inclusion of culture, ideation, and politics in the process (Van Wey et al. 2005), and we find evidence to back that up and encourage future research to pay further attention to these. We focused primarily on ideation and investigated how changing attitudes, values, and norms connected to developmental idealism seem to influence humans perceptions of and interaction with the environment.

First we point out that the introduction and dissemination of developmental idealism leads to shame among adults who are uneducated and poor. This shame is likely to affect their confidence and agency when it comes to pointing out problems and suggesting solutions for managing the natural environment. We recommend that institutions that are key agents in the push to embrace developmental idealism (e.g., governments, NGOs, INGOs, etc…) consider how to empower youth and adults at the same time. In other words, we need to develop programs and policies that promote education and scientific research and solutions without deriding adults who have years of experience and key insight regarding natural resource management.

The same goes for religion and other aspects of indigenous culture. Many aid organizations already attempt this, but we suspect more could be done to value and promote cultural practices that imbibe the environment with reverence and encourage environmental stewardship rather than ignorance and overuse. It seems that one often unintended consequence of the large support for the developmental model is the "disenchantment" of nature and the cultural tools developed to revere it.

Our findings are only from one small region in the small country of Nepal, but the value to this approach is to provide rich detail of the systems of meaning in one setting that might be relevant in others. As we amass a record of these dynamics across a variety of locations with different physical environments as well as culture and politics, we can begin to glean the outlines of a more broad and comprehensive model of human-environment interactions that incorporates culture, ideational, and political factors. Much like Greenhalgh's (1995) path-breaking suggestion that we better "situate" fertility in its cultural and political contexts, we should do the same with human-environment interactions. This study is one step in that direction.

REFERENCES

Axinn, William G., and Scott Yabiku. 2001. "Social Change, the Social Organization of Families, and Fertility Limitation."*American Journal of Sociology* 106(5):1219-1261.

Beutel, Ann M. and William G. Axinn. 2002. "Gender, Social Change, and Educational Attainment". *Journal* . 109-134.

Dietz, T. and E. A. Rosa, 1994. "Rethinking the environmental impacts of population, affluence and technology." *Human Ecology Review* 1(1).

Durham, D. F. (1992). "Cultural carrying capacity: IMPACT". *Focus* (Carrying Capacity Net work) 2(3): 5-8.

Ehrlich, P. R. & Ehrlich, A. H. (1990). *The population explosion*. New York: Simon & Schuster.

Ellis 1995

Ghimire, Krishna. 1992. *Forest or Farm? The Politics of Poverty and Land Hunger in Nepal*. Oxford:Oxford University Press.

Ghimire, Dirgha J., William G. Axinn, Scott T. Yabiku, and Arland Thornton. 2006. "Social Change, Premarital Nonfamily Experience, and Spouse Choice in an Arranged Marriage Society." *American Journal of Sociology* 111(4):1181-1218.

Grant, J. P. 1994. *The State of the World's Children*. Oxford: Oxford University Press for UNICEF.

Guneratne, Arjun. 1996. The tax man cometh: the impact of revenue collection on subsistence strategies in Chitwan Tharu society, *Studies in Nepali History and Society* 1(1):5-35.

Greenhalgh, Susan. 1995. "Anthropology Theorizes Reproduction: Integrating Practice, Political Economic, and Feminist Perspectives." In *Situating Fertility: Anthropology and Demographic Inquiry*, Susan Greenhalgh, ed. Cambridge: Cambridge University Press, 1995, pp. 3-28.

Hempel, Lamont C. 1997. "Population in context: A typology of environmental driving forces. *Population & Environment* 18(5): 439-461.

KC, Bal K. and Bhim R. Suwal. 1993. Urbanization and Migration in Nepal, *Population and Development in Nepal* 3:11-28.

Matthews, S.A., Shivakoti, G.P. & Chhetri, N. (2000) "Population forces and environmental change: observations from Western Chitwan, Nepal." *Society and Natural Resources* 13: 763–775.

Morgan, David. 2007. "Paradigms Lost and Pragmatism Regained." *Journal of Mixed Methods Research* 1(1): 48-76.

Shivakoti, G., Varughese, G., Ostrom, E., Shukla, A. and Thapa, G. (eds.) 1997 *People andparticipation in sustainable development: understanding the dynamics of natural resource systems.* Proceedings of an

international conference on Political Theory and Policy Analysis held at the Institute of Agriculture and Animal Science, Rampur, Chitwan, Nepal, March 17-21 1996. Indiana University, Bloomington, IN.

Shivakoti, Ganesh P., William G. Axinn, Prem Bhandari, and Netra B. Chhetri. 1999. “The Impact of Community Context on Land Use in an Agricultural Society.” *Population and Environment* 20(3):191-213.

Shrestha, Sundar S. and Prem Bhandari. 2007. "Environmental Security and Labor Migration in Nepal."*Population and Environment* 29(1):25-38.
Thornton, Arland. 2005. *Reading History Sideways: The Fallacy and Enduring Impact of the Developmental Paradigm on Family Life*. Chicago: University of Chicago Press.

Thornton, Arland, Dirgha Ghimire, and Colter Mitchell. 2004. "The Measurement and Prevalence of Developmental Thinking about the Family: Evidence from Nepal." PSC Research Report No. 04-567.

Van Wey, Leah K., Elinor Ostrom, and Vicky Meretsky. 2005. “Theories Underlying the Study of Human Environment Interactions.” Pp. 23-56 in *See the forest and the trees: human-environment interactions in forest ecosystems*, edited by E.F. Moran and E. Ostrom. Cambridge, MA: MIT Press.

White, Jr., Lynn. 1967. "The Historical Roots of Our Ecological Crisis," *Science* 155(3767):1203-1207.

Yabiku, Scott T. 2005. “The Effect of Non-family Experiences on Age of Marriage in a Setting of Rapid Social Change.”*Population Studies* 59(3):339-354.

Table 1. Demographic Characteristics of Focus Groups

Village*	Gender	N	Age Range	Caste/Ethnic Groups Represented**
River Bend	Male	10	35-60	HTB, TTB
River Bend	Female	9	30-50	HTB, TTB
New Village	Male	9	35-45	HCH, HTB, TTB
New Village	Female	12	30-40	HCH, HTB, TTB
Place of Shiva	Male	8	32-55	LCH, TTB, HTB
Place of Shiva	Female	9	30-45	LCH, TTB, HTB
Windy Place	Male	12	35-65	LCH, HCH, TTB
Windy Place	Female	10	27-60	LCH, HCH, TTB
Crossroads Village	Male	9	30-50	TTB
Crossroads Village	Female	7	28-45	TTB
Place of Flowers	Male	8	35-60	LCH, TTB, HTB, HCH
Place of Flowers	Female	12	28-50	LCH, TTB, HTB, HCH

*Pseudonyms are used

**Abbreviations for Caste/Ethnic Group are as follows: HCH=High Caste Hindu; LCH=Lower Caste Hindu; HTB=Hill Tibeto-Burmese; TTB=Terai Tibeto-Burmese.

Appendix A. Interview Guide (English Version)

Hello, my name is [moderator's name], and I am a graduate student working with [professor's name], a professor from [professor's university]. Also here with us today are _____. We are here to conduct a focus group interview. That is a conversation in which we will pose questions to the group and you should feel free to answer open and honestly. We are not looking for any specific answers. We are purely interested in what you genuinely think. The questions will be related to your interactions with nature and your view of the environment. We believe it is important to learn from you, the local residents of the Chitwan Valley, what your perceptions of nature and the environment are, including its quality, any changes over time, and how people in Chitwan treat the environment. We will also ask you what you think of various NGOs and organizations that are concerned with the environment. Please keep in mind that your participation is voluntary. You can choose to stop participating at any time and you do not have to answer any question you would not like to answer.

Do you have any questions before we begin?

Let's go ahead and get started.

GENERAL PERCEPTIONS/CONCERNS ABOUT THE ENVIRONMENT

- What are your impressions of the current state of the natural environment in Chitwan?
    - Are there problems? If so, what are they? (Interview assistants will write all mentions down and the moderator will make sure each topic is covered in depth)

SPECIFIC ENVIRONMENTAL ISSUES

FOR EACH PROBLEM RAISED:

- What is the current state of _____ in and around your homes?
- How has this problem come about? What is the history of this problem?
    - When did the problem start? How did you first notice it or hear about it?
    - What kinds of changes in _____ have you observed over time?
    - What are the main causes of the problem?
    - What are the effects of this problem?
    - How responsible are humans for this problem? How so?
- Does everyone here agree with this assessment? Would everyone in the village agree? Why/why not?
- What sorts of solutions have been proposed? Have they been implemented? Are they successful? Why / why not?
- Would you be willing to pay for or help fix some of these problems? Would others who live around here? Why/why not?
- Is it your responsibility, as local residents, to pay for conservation efforts or come up with potential solutions?
- How dangerous do you think this problem is to the environment and surrounding community?

There are a few aspects of the environment we have not talked about yet. We would like to get your thoughts on these. INTERVIEWER: PROBE ON ALL ASPECTS OF THE ENVIRONMENT NOT COVERED USING QUESTIONS ABOVE.

Land availability	*Forest/Trees*	*The national park*	*Water quality/pollution*
Land quality	*Flora diversity*	*Animals*	*Air quality/pollution*
Garbage disposal	*Plastics*	*Toilet availability**	

**Aspects of the environment that emerged as important discussion topics in the interviews*

- Which of all of the problems that we have discussed are most severe? How so?
- Which of the problems that we have discussed are of the least concern? Why?

ENVIRONMENTAL ORGANIZATIONS

- Do you know of any organizations/movements that exist to help the environment in Chitwan?
    - If YES: Can you please tell us about these organizations?
        - What are their names?
        - Where are their main offices located?
        - What is their mission/purpose?
        - What kinds of activities do they do?
        - When were they established?
        - Are any of you involved with the organization? Describe involvement.
        - How do you feel about these organizations (i.e. – are they helping? Causing more problems/complications)?
        - What are your experiences like with these organizations; in other words, can you tell me about an encounter/interaction you have had with one of them?
        - How do these organizations compare to each other (i.e. – are some more helpful than others)?
        - What do your friends and neighbors think about them?
        - If you had the choice would you keep them or get rid of them?
        - How did you first hear about these organizations?
    - If NO: Should there be organizations that help solve environmental problems? Why/why not?
        - IF YES: What types of organizations?
        - What should they do?

- Do you know of any local groups such as women's groups or youth's groups that help with or try to solve your environmental issues?
    - IF YES: Which groups are they? What exactly do they do to help?
- Are the local political leaders doing anything to encourage environmental conservation?
    - IF YES: What types of things are they doing? Do you and your neighbors agree with what they are doing?
    - IF NO: Do you think they should be doing something to help solve environmental issues? What types of things should they be doing?

- Are you aware of any efforts that schools or teacher make to educate students about environmental issues?
    - IF YES: Can you describe what they do or say?
        - How do students respond?
        - Do your children tell you about the things they learn in school about the environment (i.e. – suggestions for more sustainable ways of living)?
    - IF NO: Should schools teach about these topics? What should they teach?

- Are you aware of any efforts that religious leaders (Hindu priests, Buddhist lamas, indigenous healers) make to educate people about environmental issues or encourage conservation?
    - IF YES: Can you describe what they do or say?
        - How do students respond?
    - IF NO: Should religious leaders teach about these topics? What should they teach?
- Do you use indigenous healers when members of your family are sick?
    - IF YES: Are they running out of plants and other supplies for the remedies they provide? Do the healers say it is a problem? Does that worry you?
- Do you do *puja* (religious rituals) for any of the environmental problems we have talked about?
    - IF YES: Which problems do you do puja for? What exactly do you do? How often do you do puja for that problem?

MORE GENERAL QUESTIONS ABOUT THE ENVIRONMENT

- Do you participate in any conservation efforts?
    - IF YES: What are some of the things you do to protect the environment and make it more sustainable?
    - IF NO: Would you be willing to? Why/why not?
- Do your friends, family, and/or neighbors do anything? IF YES: How so?
- Do you think people (i.e. – your neighbors, family members, or friends) could be doing more to protect and conserve the environment?
- Do you know of any people who go into the jungle to collect fodder or wood?
    - IF YES: How often do they go? Are there any obstacles or problems they face there that they are worried about?
- How do you feel about the jungle and its regulations? Does it work for everyone? Is it problematic? Is conservation worth the rules and regulations?
- Are there any recycling systems/efforts in place in this area?
    - IF YES: Tell us how they work.
- How do you feel about things like recycling?
    - Is it beneficial?
    - Is it a waste of time and effort?
    - Do you know of any benefits or problems that recycling could bring?
    - Are people too worried or not worried enough about recycling?
- Do you have to pay for your water (i.e. – for drinking and irrigating)?
- Are people raising more or less livestock than they used to?
    - IF MORE OR LESS: Why is that?
- Do you think there should be laws that are aimed at conserving the environment?
- Do you think there should be some kind of check on how people are using the environment or affecting the environment with other actions?
- Do humans have the right to modify the environment in any way so as to suit their needs?

- Do you think people who live around here worry too much or too little about the future of the environment? Or do people worry just enough about the environment?
- Do people worry too much about how human progress is harming the environment?
- How responsible are humans for damaging the environment?
- Are humans responsible for the environment in general? If so, what is your reasoning for that?
- How much control do you think you have over these environmental issues or the environment in general?