DISSERTATION

GENDER, SECURITY, AND THE ENVIRONMENT: LESSONS FROM THE GANGES-
BRAHMAPUTRA-MEGHNA WATER BASIN

Submitted by

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ABSTRACT OF DISSERTATION

GENDER, SECURITY, AND THE ENVIRONMENT: LESSONS FROM THE GANGES-
BRAHMAPUTRA-MEGHNA WATER BASIN

Environmental security has come to represent a way for scholars and policymakers

to link the concepts of traditional security scholarship to the environment. Within academia,

scholars use the concept of environmental security in several different ways, as well as

using alternative terms to convey a relationship between security and the environment.

While there has been some scholarly work conducted that seeks to identify the ways that

academics link these concepts, there has been little systematic work done that examines

the intersection between approaches to environmental security and gender. This

dissertation argues the necessity of including gender into the discourses on security and the

environment. In the project I address the theoretical and practical implications of ignoring

the gendered aspects of security and the environment and the possibilities for introducing

gender into theoretical and political debates linking environment and security.

The key questions that this project explores are 1) How are the issues of security and

the environment linked in theory and practice; 2) To what extent is gender a part of these

discussions; and 3) What are the implications of how these issues are linked? I undertook

three research steps for the dissertation. Step 1- discourse analysis of the academic

literature linking environment and security. This step involved examining the academic

literature using discourse analysis to identify three distinct discourses linking environment

and security. Step 2- gender analysis of the three major discourses linking environment and

security. This step consisted of tracing the presence and absence of gender in the security

and environment debates in order to understand the place of gender currently, and the

possible inclusion of gender into the discourses. Step 3- case studies of water issues in

South Asia. These case studies explore some of these ideas in the context of real world

policy discussion to see whether these same discourses inform policy debates; whether and

how gender is considered in these policy debates; and refine some of the ideas/concepts

about how gender matters and could be incorporated in the academic discussions.

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Chapter 1- Introduction: Where Does Gender Fit Into Discussions of Security and the Environment?

Since the end of the Cold War, environmental security has come to represent a way for scholars and policymakers to link the concepts of traditional security scholarship to the environment. Scholars use the concept of environmental security in several different ways, as well as using multiple terms to convey a relationship between security and the environment. While there has been some scholarship that seeks to identify the ways that academics link these concepts (Barnett 2001; Swatuk 2005), there has been little systematic work to examine the intersection between approaches to environmental security and gender.

This dissertation argues the necessity of including gender into the discourses on security and the environment.[*] I seek to understand the ways in which incorporating gender complements the current discussions as well as the ways in which gender would alter these discussions. In the project I address the theoretical and practical implications of ignoring the gendered aspects of security and the environment and the possibilities for introducing gender into theoretical and political debates linking environment and security.

This project will demonstrate that the security and the environment debate exhibits gendered understandings of both of these concepts, and these gendered assumptions and understandings benefit particular people and are often detrimental to others, particularly as they influence the process of policy-making. Examining security and the environment through a gender lens gives insight into the gendered nature of international environmental politics and provides crucial redefinitions of the concept that are more useful, both in theory and practice.

It is essential for international relations as a discipline to be reflexive in their terms and concepts in order for the field to maintain its relevance for everyday life. Since the various discourses on security and the environment have important, unexplored gender dimensions, then these must be uncovered both for the advancement of international relations in general, and so that the security of humans and the environment can be better protected. In order to achieve this aim, my project will focus on security and the environment discourses in both theory and practice and the gender implications of each.

The key questions that this project explores are 1) How are the issues of security and the environment linked in theory and practice; 2) To what extent is gender a part of these discussions; and 3) What are the implications of how these issues are linked? This represents an important area of study for several reasons. First, there exists a significant literature on both the gendered impacts of conflict and war (Enloe 1990, 2000; Tickner 2001), as well as a literature on the intersection between gender and the environment (Merchant 1996; Warren 1997, 2000), however the ideas of these scholars are rarely incorporated into current environmental security discourses. This appears to represent a lacunae in the debate on security and the environment. If there are specific gendered aspects of both of these concepts, it seems logical that these gendered aspects could be explored under the umbrella of "environmental security." For example, research on water policy demonstrates that women are often adversely affected by the prevailing tendency towards privatization of water sources (Wallace and Coles 2005). Once we accept that water is essential for human survival, and therefore security, then environmental security discourses become a natural place for a gender issue of this sort to be explored, though gender must first develop into a key feature of these

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discourses. Without exposing the relevance and presence of gender in these discourses, the theoretical debate may continue without the inclusion of an important element. This endeavor will serve to highlight gendered understandings of both security and the environment and reveal the complexities of this discussion.

Second, since the concept of environmental security has begun to creep into policy discourse it is important that all aspects of environmental security be explored. Environmental security has been a topic of discussion recently in both the Security Council of the United Nations, as well as within the United States Senate. If a recognition of specific gender implications is not acknowledged, then the policy-making process is not being informed by all the relevant information. The policy salience of environmental security issues means that as scholars, we must acknowledge the further implications of our work, and therefore consider all pertinent aspects of discussion. This can not be achieved without expanding the current policy-making or decision-making discourses to include gender. For example, if gender is not included in debates about climate change, then an important policy opportunity is missed. This is particularly significant in terms of environmental polices that have an impact on livelihood issues. Exposing gender in these discourses may help scholars and activists engage with influential international institutions in order to demonstrate the important environmental insecurities that women and men face, and influence the policy-making process in a way that improves lives.

Both gender and the environment have important humanitarian implications. If it is found that there are gender dimensions of environmental changes that negatively impact daily life, then it is important to reveal them to improve strategies of humanitarian aid. Rather than

the implications of environmental change simply being a theoretical issue, these concerns are also often survival issues for those living in many parts of the world. There has been significant work conducted that explores the particular gendered implications of environmental change for populations in society, focusing especially on the unique hardships that women face because of environmental degradation (Newman 1994; Shiva 1988, 1994; Singh et al 2006). This should be an essential element in discourses on security and the environment because women often face unique security threats in these situations. These security threats can be addressed by states in the policymaking process, but also at levels above and below the state by international organizations and local groups that focus on security issues and environmental issues.

This introductory chapter begins by presenting an overview of the three central concepts studied in the dissertation; security, environment, and gender. I then move on to an explanation of the research design and methods used in the dissertation. The chapter concludes with a plan of the dissertation, in which I outline the remaining chapters of the project.

Starting Questions

How do scholars conceptualize security?

Security has historically been one of the most fundamental topics of concern for international relations scholars. Lipschutz (1995: 8) argues that "there are not only struggles over security among nations, but also struggles over security among notions. Winning the right to define security provides not just access to resources but also the *authority* to articulate new

definitions and discourses of security, as well." The problematization of this concept contributes to making international relations scholarship more reflexive. It causes us to step back and examine our assumptions about both the definition of security and also the way that security policy is formulated and carried out. Before exploring how scholars link the concept of security with that of the environment, some time needs to be spent discussing what the term security means. Within academic study, a common occurrence is for a specific term to be conceptualized multiple ways by different scholars and at different times. "Security" indeed fits this pattern. How one defines this term will have implications for the ways in which it is linked to the environment.

Although a thorough treatment of all security literature is not the intention of this project, an overview of some of the literature will be helpful to get a sense of where the concept has been and where it may be heading. It is also useful to set up the comparison between traditional security notions and discourses on security and environment that appears in chapter 2. According to Buzan (1991: 7), security constitutes an "essentially contested concept," meaning that the literature on security reflects a wide variety of views. In a discussion of the genealogy of the concept of security, Der Derian (1995: 28) claims "[c]onventionally understood, security refers to a condition of being protected, free from danger, safety." While this definition of security does not identify who or what is being protected, many scholars urge readers to begin thinking about security by asking both what is the referent object for security, and what are the necessary conditions for security (Buzan 1991).

The state has historically been the principal subject of security scholarship. Traditional security scholarship is conceptualized as the study of the threat, use, and control of military force as discussed by Nye and Lynn-Jones (1988). "Security studies assumes that conflict between states is always a possibility and that the use of military force has far-reaching effects on states and societies" (Walt 1991: 212). While there is some attention given to other entities in traditional security studies, the focus tends to come back to the state. Many see typical security studies as essentially similar to realist notions that the state is a sovereign entity that pursues its own advantage within a context of other sovereign states engaging in the same behavior.

The fact that the state has been the key actor associated with "security" has particular implications both for the position of states in the international system, and for the way that security is studied and carried out. Hansen (2006: 34) claims that "underpinning the concept of 'national security' is a particular form of identity construction- one tied to the sovereign state and articulating a radical form of identity- and a distinct rhetorical and discursive force which bestows power as well as responsibility on those speaking within it." This implies that the state's association as the protectors of security gives it a particular authority. Additionally, a narrow focus on state security privileges certain types of knowledge over others. Booth (2005: 9) remarks that "realist-derived security studies continues to survive and flourish because the approach is congenial for those who prosper from the intellectual hegemony of a top-down, statist, power-centric, masculinized, ethnocentric, and militarized worldview of security."

Most scholars will agree that since its origins, security has had contested and often contradictory meanings. Der Derian (1995) attributes some of this difficulty to the efforts of

various individuals to fix and attach meanings for their own ends. This charge could refer to both scholars and policymakers alike. The security label comes with certain policy expectations. Hansen (2006: 35) claims that "security discourses are thus characterized by a dual political dynamic: they invest those enacting security policies with the legitimate *power* to undertake decisive and otherwise exceptional actions, but they also construct those actors with a particular *responsibility* for doing so." This means that we tend to see an obligation for some actor, often the state, to address security issues or "fix" them.

During the past few decades, these conceptions of security have been challenged by scholars wishing to problematize, or contest, the origins of the concept as well as those wishing to include new elements into the definition such as economics and the environment (Barnett 2001). Campbell attempts to uncover the constructed nature of the concept of security by pointing out how foreign policy, and United States foreign policy in particular, is constructed out of a sense of "otherness" rather than simply assessing threat. Campbell (1998: x) claims that "[i]nstead of asking how United States foreign policy serves the national interest, [his book] examines how, through the inscription of foreignness, United States foreign policy helps produce and reproduce the political identity of the doer supposedly behind the deed." Campbell's postmodern take on security problematizes the traditional conceptions by including aspects of identity and statecraft. For Campbell (1998), many security issues arise out of individuals in a state attempting to identify an "other" as an enemy. Traditional notions within security literature such as "threat" and "danger" become subjective.

Additionally, the field of critical security studies (CSS) has emerged as a challenge to traditional security scholarship. Booth (2005: 16), a key CSS scholar, explains the field as

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"concerned with the pursuit of critical knowledge about security in world politics. Security is conceived comprehensively, embracing theories and practices at multiple levels of society, from the individual to the whole human species." Three central concepts of CSS are security, community and emancipation- suggesting a radically different way to understand security in international relations.[1]

Once traditional notions of security become questioned and perhaps more open to interpretation, room is made for the inclusion of previously neglected additions to security. This is where notions like economic security, human security, and environmental or ecological security come into play. The end of the Cold War has been flagged as an important point in the development of security studies. Page (2002) argues that as the Cold War wound down and the threat to national security receded, many security scholars, and the security community in general, began to accept the idea that there might be non-military threats to national security. This implies that while the target of concern for security scholars may have remained the state, the nature of the threat had shifted from being solely military to something else. Barnett (2001) claims that several new threats to security were identified as central to the preservation of national security in the United States after the end of the Cold War. Among these are the relative strength of the Japanese and German economies (economic security), energy availability (energy security), the lack of sufficient stores of food (food security) and an array of difficulties associated with the "Third World" including the possibility of failed states and

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[1] Wyn Jones (1999: 160) says "if the project of critical security studies is conceived in terms of a war of position, then the main task of those intellectuals who align themselves with the enterprise is to attempt to undermine the prevailing hegemonic security discourse. This may be accomplished by utilizing specialist information and expertise to engage in an immanent critique of the prevailing security regimes, that is, comparing the justifications of those regimes with actual outcomes. When this is attempted in the security field, the prevailing structures and regimes are found to fail grievously on their own terms."

transboundary crime. Finally, Buzan (1991) identifies security as primarily being about the fate of human collectives, and only secondarily about the security of individual humans. With this in mind, he identifies five major sectors as potentially affecting the security of human collectives: military, political, economic, societal and environmental. Each of these represents a shift in the way that we think about security, including the threats and vulnerabilities that may be faced.

Threat and vulnerability are two terms commonly discussed in connection with both traditional notions of security and expanded versions. Liotta (2005: 51) explains that a "threat is *identifiable, often immediate, and requires an understandable response.* Military force, for example, has traditionally been sized against threats: to defend a state against external aggression, to protect vital national interests, and to enhance state security... A threat, in short, is either *clearly visible or commonly acknowledged.*" He argues that vulnerabilities are not as clearly defined, but can include disease, hunger, unemployment, crime, social conflict, etc. In a discussion of security in most forms, it is necessary to identify potential threats and vulnerabilities. The sources of threats and vulnerabilities will be different for different types of security, however. For example, the sources of threats in Buzan's category of societal security will come from things like increased outside influence that erodes traditions or culture, or advancements in communications technology that increase the influx of foreign languages in a society rather than military might of a state.

The inclusion of alternative threats into a discussion of security is not, however, viewed by all as a positive move. Deudney (1990: 194) claims that "if all large-scale evils become threats to security, the result will be a *dedefinition* rather than a *redefinition* of security." Wæver (1995) offers another warning, claiming that expanding the notion of security may

actually serve to strengthen the hold that the state possesses over more areas. His logic is that since security issues have traditionally been seen as the purview of the state, identifying threats other than military ones as security threats will give the state greater control over more issues. Securitization means "the issue is presented as an existential threat, requiring emergency measures and justifying actions outside the normal bounds of political procedure" (Buzan, Wæver, de Wilde 1998: 24). State sponsored solutions may or may not be the optimal resolution for each problem. How this relates specifically to security and the environment is a topic that will be addressed in later chapters.

In sum, security studies has a long history within international relations, but has seen some important changes in recent years. These changes include the addition of elements that have not historically been understood as "high politics." There are those who enthusiastically welcome these additions as challenges to state-centric, military security scholarship. Alternatively, there are those who see these additions as either watering down the concept of security past the point of effectiveness, or as unnecessarily militarizing or securitizing issues that are better addressed through a different lens.

What is Environment?

Like the concept of security, there is much debate over what constitutes the natural environment. There is much disagreement on seemingly basic concepts such as what is "the environment" or "nature." For example, is a beaver dam somehow more a part of the environment than a human-made dam? Similarly, is a human-made park as much a part of the environment as an area of land untouched by human beings? Providing a simple yes or no

answer to these types of questions may appear simple until an explanation of that answer is required.

Many argue that nature is a socially constructed entity (Chaloupka 2000; Cronon 1996). Nature is a human construction rather than anything organic or non-human-made. There is not some neat, universally acceptable definition of nature (Griffin 1997). According to Cronon (1996), a peoples concepts of nature are largely dependent on who they are and where they are from. This context-specific conceptualization leads to a vast multitude of definitions of nature.

Similarly, the concept of environment is regularly contested. For many, the environment is seen in anthropocentric terms, meaning a focus on what the environment provides for humans. This view includes things like natural resources and nature for aesthetic value. In sharp contrast, thinkers such as ecofeminists and Deep Ecologists purpose an ecocentric view of the environment. Ecocentrism refers to the idea that independent value must be placed on ecosystems and all living beings and not just on humans (Dabelko and Matthew 2003; Paterson 2001). Naess (1995) elaborates on this idea by saying that both human and non-human life on Earth have value in themselves and that this value is independent of the usefulness of the non-human world for human purposes. The environment, according to an ecocentric view, is made up of living things such as humans, animals and plants, but also includes things like ecosystems and watersheds. This disagreement on whether to view the environment in anthropocentric or ecocentric terms has direct implications for the ways that security and the environment are combined in distinct discourses.

Until the 1980s, most governments around the world considered environmental issues to be a fairly low priority (Chasek et al 2006). This has changed dramatically in recent years, mainly due to the realization that environmental issues have a variety of impacts on our daily lives. Over the years, the types of issues emphasized by scholars and policymakers have changed. Early concerns included the extraction and use of resources and species and the implications of population growth on them (Stevis 2006). Dryzek (2005: 3) explains

> Over time, these concerns have been supplemented by worries about energy supply, animal rights, species extinction, global climate change, depletion of the ozone layer in the upper atmosphere, toxic wastes, the protection of whole ecosystems, environmental justice, food safety, and genetically modified organisms. All these issues are interlaced with a range of moral and aesthetic questions about human livelihood, public attitudes, and our proper relation to other entities on the planet (occasionally even off it).

As this extensive list suggests, there are a wide variety of environmental issues that have gotten global attention. Each of these issues have been the subject of extensive debate at multiple levels in society, including the global, national, and local levels (Speth and Haas 2006).

Increased scientific understanding of environmental issues has contributed to a shift in the way that we view the environment. We now have a better understanding both of what contributes to environmental change, and of what the outcomes of environmental degradation are likely to be in the future. Chasek et al (2006: 2) argue that "[r]ealization that environmental threats have serious socioeconomic and human costs and that they cannot be solved by the unilateral decisions of states has given impetus to increased international cooperation in halting or reversing environmental degradation." Despite this realization, there remains a high degree of debate about how environmental issues should be addressed, as well as how

environmental change should be balanced with other concerns, including economic growth (Clapp and Dauvergne 2005).

Economic growth, or economic globalization, and population growth are two concepts that are often linked with discussions of environmental issues. There has been a tremendous increase in economic activity at all levels in the past 100 years. "Cross-border financial flows, foreign direct investment, and international trade have grown phenomenally, as governments have actively removed barriers to these types of transactions" (Clapp and Dauvergne 2005: 23). Many argue that this increased economic activity has negative impacts on the environment, including the overconsumption of resources and the increase of waste. These impacts are worsened when more and more people consume. This it is directly linked to population issues. Between 1979 and 2004, the global population increased by 2 billion individuals from 4.4 billion to 6.4 billion. This statistic is staggering when compared to the fact that it took all of human history up until 1900 for the global population to reach 1.5 billion people (Speth and Haas 2006). Both economic activities and population growth are recurring features in the debates about nearly all of the environmental issues discussed above. Additionally, both topics factor heavily in the discourses on security and environment that will be discussed first in chapter 2, and throughout the dissertation.

In sum, the concept of environment, like security, is a contested concept. Many see nature as a social construction, something contingent on the context within which it is viewed. Additionally, there is disagreement about whether environment should be viewed through an anthropocentric or an ecocentric lens. Those who argue from an anthropocentric position see the environment as something that humans are dominant over. Those who argue from an

ecocentric position see the environment as an entity that has value in and of itself, regardless of the position of humans. There have been a variety of environmental issues that have gotten the notice of scholars and policymakers over the years. An important shift has been the recognition that many environmental issues are global or transboundary in nature and require a coordinated effort to address them.

What is Gender?

Gender is the central, uniting concept for feminist scholars. Zalewski (1995: 339) argues that "the driving force of feminism is its attention to gender and not simply to women. To be sure, for many feminists the concern about the injustices done to women because of their sex is paramount, but the concept, nature and practice of gender are key." Gender can be defined as a set of socially constructed, ideal type ideas about what men and women ought to be. This definition has a few important pieces; firstly the idea of social construction. Rather than gender roles and assumptions being deterministic entities, they directly come out of a society's expectations. Gender characteristics are cultural creations that are passed on through socialization (D'Amico and Beckman 1994).

The second piece of the definition refers to the difference between gender and sex. Peterson and Runyan (1999: 30) point out

> Because models of appropriate gender behavior vary, we know that femininity and masculinity are not timeless or separable from the contexts in which they are observed. Thus, gender rests not on biological sex differences but on *interpretations* or constructions of behavior that are culturally specific and may or may not have anything to do with biological differences.

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The term "sex" is typically used to describe biological differences between people understood to be men and people understood to be women (Sjoberg and Gentry 2007). Gender describes the socially constituted differences between these same groups. "Masculinities and femininities are made up of behaviour expectations, stereotypes, and rules which apply to persons because they are understood to be members of particular sex categories" (Sjoberg and Gentry 2007: 6).

There has been a lack of attention to these issues in international relations scholarship. More importantly, much international relations scholarship continues the assumption that gender differences are deterministic, that men and women really do exhibit dichotomous characteristics. Kinsella (2003: 296) argues that "by insisting on a definition of sex and gender as if their conceptions are *already* settled and natural categories- indeed, empirical categories- one completely misses the politics and power of conceptual definition and the relationship of concepts to understanding. Categories and concepts are not neutral." Not all feminists agree on what this means for future scholarship. Where disagreement often comes into play is in discussions of what should be done about this and the consequences that are likely to follow.

Like these scholars, I see the inclusion of gender in my analysis to mean that both "men" and "women" are important subjects of study. Carver (2003: 290) claims that "it is often difficult to persuade men that they have any gender or that gender is of any relevance or interest, other than as something that women do, about women..." On the contrary, gender stereotypes have profound implications for men as well. This is particularly the case when we examine something like expectations of masculine behavior. Traits associated with masculinity in many societies include aggression, reason, political beings, etc. (Peterson and Runyan 1999).

These are high standards to live up to, and many men face ridicule when they fall short of achieving masculine ideals.

One critique of gender is that it reduces people to simplistic assumptions about their identity based on a set of socially constructed expectations. Men are one thing and women are another. This disregards the complexity of individuals. Moreover, it tends to assume that generalizations can be made across cultures with regard to the characteristics and experiences of members of gender groups. This is particularly seen as problematic by feminists from the Global South, who argue that this reduces the agency of women who are often viewed as "victims" (Mohanty 2003). This critique is even extended to feminists who disregard the complexity of experiences across the globe.

Gender is an important concept in international relations because of its role is shaping inequalities in society. In every society, traits and characteristics associated with masculinity are more highly valued than those associated with femininity. This affects both how institutions in society look, and the differential access of men and women to these institutions. Tickner (1992: 7) claims that "gender difference has played an important and essential role in the structuring of social inequalities in much of human history and that the resulting differences in self-identifications, human understandings, social status, and power relationships are unjustified." This relates to the concept of patriarchy. "[P]atriarchy is the structure and ideological system that perpetuates the privileging of masculinity. All kinds of social systems and institutions can become patriarchal. Whole cultures can become patriarchal" (Enloe 2004: 4). Most feminists have a focus on patriarchy because patriarchal systems marginalize that which is associated

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with female. Again, both men and women are instrumental in supporting patriarchal systems and their continuation.

In sum, gender refers to a set of socially constructed expectations about what men and women ought to be. Gender is distinct from biological sex, and includes a set of criteria of what those understood to belong to different sex groups should exhibit. International relations scholarship has been slow to incorporate gender and gender concerns in a significant way. This is regarded as unfortunate because of the role that patriarchy has in structuring institutions in ways that value that which is masculine over that which is feminine.

Research Design and Methods

The research design for this project includes an exploration of security and environment discourses in both theory and practice. I undertook three research steps for the dissertation.

- Step 1- discourse analysis of the academic literature linking environment and security. This step involved examining the academic literature using discourse analysis to identify three distinct discourses linking environment and security.

- Step 2- gender analysis of the three major discourses linking environment and security. This step consisted of tracing the presence and absence of gender in the security and environment debates in order to understand the place of gender currently, and the possible inclusion of gender into the discourses.

- Step 3- case studies of water issues in South Asia. These case studies explore some of these ideas in the context of real world policy discussion to see 1) whether these same discourses

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inform policy debates, 2) whether and how gender is considered in these policy debates, and 3) refine some of the ideas/concepts about how gender matters and could be incorporated in the academic discussions.

Discourse Analysis

Discourse analysis has a variety of meanings. One definition is "an attempt to identify and describe regularities in the methods used by participants as they construct the discourse through which they establish the character of their actions and the beliefs in the course of interaction" (Gilbert and Mulkay 1984: 14). Another definition is "the examination of argumentative structure in documents and other written or spoken statements as well as the practices through which these utterances are made" (van den Brink and Metze 2006: 66). I understand discourse analysis to be a process of identifying regularized ways of conceptualizing or discussing certain issues. Discourses are powerful forces within both academic and policy debates.[2] According to Haas (2002: 1), "Discourses impart meaning to an ambiguous policy domain. Discourses are important because they institutionalize cognitive frames. They identify issues as problems, set agendas, and define the salient aspects of issues as problems for decision-makers. Each discourse or perspective rests on different assumptions, goals and values... and suggests different policy solutions. They have the effect of defining provocations or crises." As this suggests, the use of one discourse over another has very real implications.

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[2] See also Johnstone (2002: 3). She claims that one particular meaning of discourses is that they are "ideas as well as ways of talking that influence and are influenced by the ideas. Discourses, in their linguistic aspect, are conventionalized sets of choices for discourse, or talk."

The process of discourse analysis involves tracing the storylines that make up a larger

discourse. A storyline is a set of concepts, ideas, or themes that are repeated and combine to

form a discourse (Hajer 2006). According to Lovell et al (2009: 93) "storylines structure the

overall terms of debate, and set limits on what practices and solutions are deemed to be

suitable and reasonable." Hajer (1995: 63) argues that storylines have several functions.

> First of all story-lines have the functional role of facilitating the reduction of
> the discursive complexity of a problem and creating possibilities for problem
> closure. Secondly, as they are accepted and more and more actors start to
> use the story-line, they get a ritual character and give a certain permanence
> to the debate. They become 'tropes' or figures of speech that rationalize a
> specific approach to what seems to be a coherent problem. Thirdly, story-
> lines allow different actors to expand their own understanding and discursive
> competence of the phenomenon beyond their own discourse of expertise or
> experience. In other words, a story-line provides the narrative that allows the
> scientist, environmentalist, politician, or whoever, to illustrate where his or
> her work fits into the jigsaw.

It is often the case that discourses include a primary, overarching storyline, and several

supporting secondary storylines. Chapter 2 outlines both the primary and secondary storylines

of the security and environment discourses.

The data of discourse analysis consists of various "texts"- both written and nonwritten

(Johnstone 2002). For the theoretical section of this dissertation, the academic literature on

security and the environment are my sources of data. These were collected through library and

on-line searches for those works that discussed a link between security and the environment.

For the practical section, items like public documents, media reports, and interview transcripts

are the data for discourse analysis. All of these texts were evaluated based on how links

between security and the environment are made. Some of this evaluation took the form of

content analysis, meaning that texts were coded for particular storylines. This involved looking

for themes, terms, and ideas that demonstrate a link between security and the environment. These themes, terms and ideas were developed inductively through reviewing the texts and can be altered during the course of analysis. I am very aware of the tensions between simply counting words, typically associated with content analysis (Johnston 2002), and situating coded material in the larger discourse. In order to minimize this I developed categories and examined the way that particular words or phrases were being used. Coding is used to break up and segment the data into simpler, general categories as well as to tease out new levels of interpretation (Coffey and Atkinson 1996).

Gender Analysis

Gender analysis is closely related to discourse analysis.[3] In fact, one strain of feminist discourse analysis is seen as "a political perspective on gender, concerned with demystifying the interrelationships of gender, power and ideology in discourse" (Lazar 2005: 5). Nearly all gender analysis deals with uncovering gender in a particular issue with the ultimate goal of social emancipation (Sjoberg 2006).[4] Gender analysis involves using a "gender-sensitive lens" which "enables us to see the extent and structure of gender hierarchy by examining both how social constructions of masculinity and femininity shape our ways of thinking and knowing and how women's and men's lives are patterened differently as a consequence of gendered practices" (Peterson and Runyan 1999: 257). Gender analysis in the theoretical section of this dissertation largely takes the form of examining gender during the course of discourse analysis

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[3] This is particularly true of critical discourse analysis, which is interested in the relationship between language and power (Weiss and Wodak 2003).

[4] Kronsell (2006) suggests that gender analysis can take place through studying the gender dynamics of documents, places and narratives.

in order to understand the place of gender within the security and the environment discourses. One of the most telling features of this exercise is noting the lack of discussion of gender or women within the existing literature. Gender analysis in the practical section takes the form of both discourse analysis of relevant texts, and examining the presence and roles of men and women in the cases. The latter includes examining gender within organizational structures, decision-making entities, the household tasks relating to water, etc. The ultimate goal of this gender analysis is to understand the gendering that takes place in theory and practice within this issue area.

Case Studies

I chose to focus on cases surrounding water for several reasons. First, water issues represent a vital life component both for humans and ecosystems. According to Klare (2002), water is a uniquely essential component of human life. It is needed for drinking, for bathing and sanitation, and for food production. At the same time, however, freshwater use has been growing at a rate that has contributed to water scarcity in parts of the world. "By 2025, 1,800 million people will be living in countries or regions with absolute water scarcity, and two-thirds of the world population could be under stress conditions" (UN Water 2006: 2). There is evidence to suggest that the situation of water scarcity will continue as both water consumption patterns and population levels increase. This is a serious situation, for as Gleick (1993: 90) has argued "[u]nlike oil, water has no substitutes."

Additionally, I chose to focus on water issues because there are significant debates about the connections between water and security, and gender and water. Both of these areas

are important for thinking about how gender can be incorporated into security and environment discourses. The next sections outline some elements of these debates.

Water and Security

There is a wealth of literature that combines the concepts of water and security in various ways (Dimitrov 2002).[5] For instance, Elhance (2000: 207) argues

> Further, national security has traditionally been viewed as comprising the physical and military-strategic security of a state, however water security is rapidly becoming a core national security concern in many arid and semiarid regions. This is because all the constituents of the new and expanded definition of national security – human security, food security, economic security, and environmental security – have intimate relationships with and are dependent on water security. This further complicates the hydropolitical calculus for all parties.

This one quote contains elements of several of security and environment discourses that will be identified in later chapters. The first point of the quote relates to the fact that water can be tied to military security. Due to the fact that water is a uniquely essential resource, there has been much scholarly discussion about the possibility of "water wars"- or conflict over water supplies. It is assumed that when states that share a river experience water scarcity, there is a good chance for conflict. The idea of "water wars" is most often examined at the level of the state, with scholars attempting to explain when states would be willing to engage in conflict over water supplies.[6] However, most scholars who use this discourse acknowledge the complexity of hydropolitics and present a fairly nuanced discussion of when conflict over water is likely to

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[5] Dimitrov (2002: 677) argues that there are several ways that scholars link water and security, and they will not all yield the same results. Additionally, he doubts whether security is "the most appropriate frame of reference for discussing water resources."

[6] There are mentions of intrastate conflicts over water, however these are rarely the focus of the main discussion (Postel and Wolf 2001 as example).

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occur (Dinar and Dinar 2000, Elhance 2000). For example, Homer-Dixon (1999: 139) claims that

wars over river water are only expected under a narrow set of circumstances.

> [T]he downstream country must be highly dependent on the water for its
> national well-being; the upstream country must be threatening to restrict
> substantially the river's flow; there must be a history of antagonism between
> the two countries; and, most importantly, the downstream country must
> believe it is militarily stronger than the upstream country.

According to these characteristics, there appear to be only a few shared watercourses that are

in danger of experiencing interstate conflict. Many scholars instead claim that water scarcity

issues are most likely to exacerbate existing conflicts (Dinar 2000; Gleick 1993; Postel and Wolf

2001). Despite there being little overall support for the idea of an all-out water war, there is a

substantial literature that examines conflict over water, both currently and into the future. In

particular, several scholars point out that climate change may contribute to increased scarcity

of river water, and thus increase the chances that states will conflict over supplies (Biswas

1999; Elhance 2000; Gleick 1993; Klare 2002).

In a discussion of the unique nature of water issues Postel (1997: 73) points out that

"[n]ot only does [water] course easily across political boundaries, it gives upstream countries a

distinct advantage over downstream neighbors. As population pressures and rising demands

press against the limits of supplies, international frictions over water are intensifying." This

observation highlights the fact that environmental factors do not confine themselves to state

territories, as well as to the fact that some areas will have an environmental advantage over

others. Hensel et al (2001: 19) argue that transboundary or cross-border river issues represent

a relatively high tangible value for states, but a relatively low intangible value. They use six

indicators to measure river salience: "1) river location in the state's homeland territory rather

than in colonial or dependent territory, 2) navigational value of the river, 3) level of population served by the river, 4) the presence of a fishing or other resource extraction industry on the river, 5) hydroelectric power generation along the river, and 6) irrigational value of the river."

There are alternative discourses that relate water issues to human insecurity. Barnett (2001: 18) claims that "water scarcity and poor water quality are arguably the most important factors in environmental insecurity." This insecurity includes humans lacking access to safe supplies of clean water and sanitation (Barnett 2001; Conca 2005; Wouters 2005). The 2005 synthesis reports of the Millennium Ecosystem Assessment says "The burden of disease from inadequate water, sanitation, and hygiene totals 1.7 million deaths and results in the loss of at least 54 million healthy life years annually. Although largely eliminated in wealthier nations, water-related diseases (malarial and diarrheal diseases, for instance) are among the most common causes of illness and death in developing countries, affecting particularly the poor" (3).

Additionally, many scholars point to water as encouraging cooperative behavior, particularly among states that share an international watercourse. The argument is that since water is such an essential resource for the populations of states, they will get beyond viewing the situation as zero-sum and find mutually acceptable water-sharing arrangements (Carius and Dabelko 2004; Dinar 2002). States will be motivated to cooperate because water is necessary for food security and desirable for energy production, both of which can contribute to increased security for populations (Biswas 1999; Postel and Wolf 2001).

The uniqueness of water is also addressed by discourses concerned about the health of the environment. Obviously, water is essential for the health and security of aquatic ecosystems. Alterations in the flow and volume of water in a watershed can result in the

extinction of species and irreversible damage to the natural landscape surrounding that water-shed. According to Postel (1997: 28) water sources like rivers perform several functions, such as "deliver nutrients to the seas, with their complex food webs;...protect wetlands, with their capacity to filter out pollutants; provide habitat for a rich diversity of aquatic life; safeguard fertile deltas; protect water quality; [and] maintain salt and sediment balances" of ecosystems. Ecologists have warned that current levels of water withdrawals and diversions are pushing many of the world's freshwater ecosystems to the breaking point (Conca 2005). This perspective will urge policymaking to be directed with the security of the environment itself in mind and the various ways that water is essential to ecosystems.

The water needs of humans and the water needs of the environment are often thought to be in competition with each other. According to the Millennium Ecosystem Assessment (2005: ii) "[p]hysical and economic water scarcity and limited or reduced access to water are major challenges facing society and are key factors limiting economic development in many countries. However, many water resource developments undertaken to increase access to water have not given adequate consideration to harmful trade-offs with other services provided by wetlands." Dimitrov (2002) is one author who points out that the water needs of ecosystems is rarely a fundamental aspect of thinking about security and environment. In other words, most discourses on water tend to be anthropocentric. Dimitrov (2002: 679) argues "if all water is used (even equitably), and it meets all the needs of all human actors concerned, this can harm the rest of the ecosystem as it disrupts the ecological functions that water performs, namely, habitat maintenance and flood control. Eventually, this breaches the security of humans because they are an integral part of the ecosystem."

Gender and water issues

There is a vibrant literature on the connections between gender and the environment (Merchant 1996; Warren 1997, 2000), and gender and water in particular (Ray 2007; Singh et al 2006; Upadhyay 2003; Wallace and Coles 2005). The connections between gender and water have been much less visible by scholars and policymakers than conflicts over water (Saleth et al 2003). This is unfortunate, because the fact is that men and women tend to experience water issues differently. In most societies, women are disproportionately responsible for the tasks of water provisioning (Conca 2005; Ray 2007). Because of this, the harmful consequences of water insecurities tend to fall on the shoulders of women. Domestic water use, which tends to be the responsibility of women, represents the most fundamental needs of society and are the basis of the human right to a minimum requirement of water (Green Cross International 2000). Recognition of these unique experiences have led some scholars and policymaking bodies to explore the connections between gender and water in order to better understand how water can be provided and managed in fair ways. An example of this is the Gender and Water Alliance (GWA), an organization that came out of the Second World Water Forum in 2000. The GWA "is a global network dedicated to mainstream gender in water resoures management" that has states, NGOs, research institutes, and IGOs as members (Gender and Water Alliance 2009).

The roles of men and women in managing water have varied over the years. Wallace and Coles (2005: 2-3) explain that

> While women were understood to bear the burden of poor water supplies, they did not feature in water policy or delivery systems in the 1950s and 1960s. The focus shifted in the 1970s and 1980s, when the obvious fact that women were the managers of domestic water, and usually the carriers of it as well, was recognized. As clearly identified water users they were seen to have the knowledge required to maximize the value of water supply improvements

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and they were formally accepted as a constituency in water development and management.

This suggests that through the years there has been a recognition that increased involvement of women in water management schemes is desirable both because of their typical roles as primary water collectors, and their unique knowledge because of this role (Singh et al 2006). In fact, water was one of the first areas where women's expertise was acknowledged (Wallace and Coles 2005).

Many scholars highlight close links between gender, water and development (Saleth et al 2003, Upadhyay 2003). Wallace and Coles (2005) feel that understanding the ways gender shapes who has control of water, who gets access, the differing needs and positions of women and men, is crucial for understanding issues of poverty and development. The current economic paradigm has definite impacts on the connections between gender and water. The World Water Forum claims that women's "subordination and the consequent barriers to their active involvement in influencing water programmes are barely addressed. There is limited attention to women's rights to water and what these would mean in practice in poor communities where women's status is often very low, although the need to do more to realize women's empowerment is acknowledged" (quoted in Chamberlain 2007: 126). We are now witnessing a rise in attention to the position of women with regard to water issues, however much more research is needed to fully explore these connections.

Water Cases in the Ganges-Brahmaputra-Meghna Basin

I chose to look at the Ganges-Brahmaputra-Meghna basin in particular because it is a region that exhibits multiple water issues- making it a fertile place to examine discussions of

security and the environment in practice. Because of the number of different water issues that could be examined in the Ganges-Brahmaputra-Meghna basin, I have narrowed my study to three cases. I used a "most-likely" case selection to choose cases in the region that I expected to map onto the three discourses on security and the environment that are outlined in chapter 2. International management of the basin involves examining the politics of treaty formation and other mechanisms of basin management that are carried out by riparian states (Bandyopadhyay 1995; Brichieri-Colombi and Bradnock 2003). Flooding in the basin region involves examining the alterations of flooding patterns in the basin region that many link to human development projects (Mirza et al 2003). Finally, impacts of agriculture on the basin involves examining the consequences that agricultural projects/developments have had on water supply and water quality in the basin (Rahman 2003). In a most-likely case "the independent variables posited by a theory are at values that strongly posit an outcome or posit an extreme outcome" (George and Bennett 2005: 121). Since the purpose of these cases is not empirical testing, but rather to highlight the practical side of discourses on security and the environment, and particularly the issue of gender, it is not essential that they match up exactly with one of the discourses. The most-likely case selection simply served as a logical way to narrow my case selection from the many that fit the criteria of water issues in this particular basin.

In order to follow a replication logic for this multiple case design, I have the same structure for each of the case chapters (Yin 2003). For each of these cases, I begin with a background discussion of the issues involved in the particular case. Then, I present the findings of the discourses analyses of each in order to understand the discourses most prevalent in each

case. Finally, I present the findings of the gender analyses of each in order to understand the role that gender plays or does not play within these cases. The ultimate goal is to understand the ways that gender presents itself in these discourses. It is another venue, besides the theoretical literature, in which to explore the gendered aspects of the three dominant security and environment discourses discussed in this project.

This is a qualitative study involving fieldwork, using primary sources such as policy-related documents, and personal interviews, as well as secondary sources such as analysis conducted by scholars as data collection tools.[7] Fieldwork is a valuable part of the project because data gathered in the process of interviews allows me to more fully address my research questions- including the ways that incorporating gender complements the environmental security discussions as well as the ways in which gender would alter these discussions. For personal interviewing I have complied with the guidelines set forth by the Human Subjects Committee at Colorado State University. See Appendix A for a list of interview questions. I conducted fieldwork for three weeks in October 2008- interviewing members of environmental organizations and women's organizations based in New Delhi, India. I confined my research to India's capital city for this particular project, but I am mindful of the different results that might have been reached if I had been able to do more extensive fieldwork- including getting a perspective from states that have been more marginalized in international management schemes in the basin region and citizens in the affected regions.

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[7] Because of significant limitations on valid, generalizable gender-differentiated data in general (Eckermann 2000; Varkey and Gupta 2005), quantitative testing is not the most appropriate method for a project of this nature at this time.

I used discourse analysis and content analysis to analyze publications from states and organizations in order to determine which discourses, if any, are used that combine security and the environment. These documents took the form of transcribed speeches, government position papers, organization websites or publications, and newspaper articles. Most of these documents I was able to obtain through the Internet before I conducted the fieldwork. The secondary data sources that I consulted, scholarly articles, were largely available to me before I conducted my fieldwork. This source is most relevant for gaining information about the decision-making processes of states. For example, there are many scholars who discuss the negotiation of water treaties in this region using security and environment discourses that I discuss (Dinar 2002; Faisal 2002; Subedi 1999; Wolf et al 2003). It was useful to compare these and other scholarly analyses to the interview data in order to either triangulate their claims, or reject them.

It is important to note that these cases represent one set in a long line of possible applications of a project like this. Because I am concerned with the wider policy-relevance of this project, I am constantly looking for ways that these cases could potentially lead to broader considerations. In particular, conducting future work on security and the environment discourses in other regions will be helpful in demonstrating the broader applications of this framework. I would argue that understanding how environmental issues are discussed, and especially appreciating the role of gender in these discourses is an important undertaking for the betterment of segments of society, including both women and men.

Plan of the Dissertation

The dissertation includes two chapters that analyze the theoretical literature on security and environment, three chapters that look at the application of these discourses in practice, and a conclusion. Chapter 2 employs discourse analysis to identify three discourses linking security and the environment. These are labeled *environmental conflict, environmental security*, and *ecological security*. Here I outline the primary and secondary storylines that appear in each of the security and environment discourses. This chapter provides a conceptual map of the security and environment debate by demonstrating the way these discussions take place.

Chapter 3 explores the place of gender in each of the security and environment discourses using gender analysis. I provide some background literature on gender and security, and gender and the environment- both of which are useful areas of scholarship with which to consider the lack of gender in current debates. The goal is to reveal the gendered assumptions that are being made and consider the subsequent implications of the absence of gender from existing security and environment discourses.

Chapters 4 - 6 consist of the three cases on water issues in the Ganges-Brahmaputra-Meghna basin- each of which represent a most-likely case for one of the security and the environment discourses. Chapter 4 explores international management of the basin among riparian states. This chapter highlights the key areas of policy debate, including issues of allocation, power dynamics among actors, and human security concerns tied to water access. Chapter 5 examines flooding in the Ganges-Brahmaputra-Meghna region. The chapter investigates the nature of flooding for the basin and the suggested causes and solutions to

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worsening flood events. Chapter 6 explores the impacts of agricultural practices for the Ganges-Brahmaputra-Meghna basin. The chapter examines the shifts in agriculture that have taken place over the past few decades that have been motivated by food security issues. These cases serve to demonstrate the ways that people are linking environment and security in practice around water issues in the region. For each case I provide background information on the water issue, a discourse analysis to determine which security and environment discourse is most prevalent, and a gender analysis to determine how gender is entering these discussions.

My primary objective is to reveal and explore the gender aspects of the three dominant discourses linking environment and security in both theory, through a review of the scholarly literature, and practice, through a study of water cases in a particular region. The conclusion serves as an assessment of the implications, discussion, and conclusions about including gender in security and environment discourses.

Chapter 2- Three Discourses on Security and the Environment: Environmental Conflict, Environmental Security, Ecological Security

> The concept of environmental security has become increasingly popular since the end of the Cold War, but its meaning is by no means clear. The literature has evolved in an *ad hoc* manner with a variety of interpretations vying for credibility. Ambiguity and diversity are characteristics of this literature...So, to pursue the question 'What is the meaning of environmental security?' is to explore certain theories and discourses which wind through modern politics and collide at the juncture of environment with security (Jon Barnett 2001: 1).

Historically, the study of security has involved the study of threats by a purposive actor to the physical safety and survival of a target and the underlying vulnerabilities which make such threats possible or attractive. As was discussed in the previous chapter, the meaning of "security" has been altered since the end of the Cold War through the process of scholars linking different concepts to security for a variety of reasons. Raising the environment into the realm of "high politics" was a big part of this endeavor but is not the only way of thinking about a security-environment connection. In this chapter I argue that there are three main discourses that are used to link security and the environment. Broadly speaking, the *environmental conflict* discourse is concerned with the potential for violent conflict over natural resources. The *environmental security* discourse is concerned with negative impacts of environmental degradation for human beings. The *ecological security* discourse focuses on negative impacts of environmental degradation for the environment itself.

This chapter explores how scholars link the concepts of security and the environment through discourse analysis of the current scholarly literature on this debate. Through discourse analysis I was able to identify the key storylines that make up each of these discourses. The chapter begins by exploring the three security and the environment discourses individually,

paying special attention to the main themes, or storylines, that are characteristic of each. It is important to note that this goes beyond a traditional literature review. In this section I focus on how scholars talk about the link between security and environment, not necessarily how scholars study environmental security. The next section compares each of the discourses to traditional notions of security in order to highlight the point that they constitute a challenge to the dominant security paradigm- although not to an equal extent. I conclude with general thoughts on the implications of the different discourses.

Environmental Conflict

Broadly conceptualized, *environmental conflict* is the point of intersection of environmental damage and traditional security concerns. There has been much scholarship that uses an *environmental conflict* discourse to propose a link between traditional security concerns and the environment. According to Ronnfeldt (1997), this research can be broken down into three generations of scholarship. The first generation was mobilized in the early 1980s, and was motivated by the claim that environmental factors ought to be integrated into the concept of security. A second generation followed in the early 1990s that was more empirically founded. These scholars based their work on case studies aimed at identifying the causal pathway from environmental scarcity to conflict. A third generation began to emerge in the late 1990s based primarily on a methodological critique of the second generation.

The *environmental conflict* discourse fits in with the expansion of conventional security concerns mentioned in chapter 1. This was essentially the goal of some of the first scholars to

use this discourse- to raise environmental concerns into the realm of "high politics." In general

terms, the main concern within the *environmental security* discourse is the potential for violent

conflict over scarce natural resources. From this broad definition, the *environmental conflict*

discourse can be viewed as starting from an anthropocentric view of the environment. This is

not to say that there is no concern for the environment itself, however, the environment is

chiefly conceptualized in terms of its benefit to human beings. The threat is located in violent

conflict that arises from resource scarcity, and those who are vulnerable are communities at a

local level and the state at a broader level.

Environmental Conflict Storylines

There are several storylines that make up the *environmental conflict* discourse, including

the particular links between conflict and the environment, resource scarcity concerns,

population concerns, human migration concerns, and unequal resource distribution/poverty

concerns. The link between violent conflict and environmental degradation is the primary

storyline for this discourse, while the others represent secondary storylines.

Conflict and the Environment

The assertion that environmental degradation will lead to violent conflict is the central,

underlying storyline of the *environmental conflict* discourse (Barnett 2001). The types of

environmental change suggested to be the most relevant are "water and land degradation,

deforestation, [and] decline in fisheries" (Homer-Dixon and Blitt 1998: 2). Most authors concern

themselves with resource conflict that includes some dimension of violence. Choucri (1984: 6)

identifies the following elements of conflict: "hostility, insecurity, antagonisms, competitions, and willingness to exert violence and inflict harm or damage." The idea of resource conflict can be expressed with alternative words as well. Authors like Twose (1991: 1) conceptualize resource conflict in terms of "the Greenwar factor." Twose contends that "in the complex web of causes leading to social and political instability, bloodshed and war, environmental degradation is playing an increasingly important role. This is the Greenwar factor."

Many scholars who use an *environmental conflict* discourse avoid actually using the term "security," likely in order to avoid some of the complications from the term's contested nature. The argument is that "[a] perspective that focuses on the relationship between the environment and conflict rather than security overcomes some of the problems of methodological rigor. Such an approach facilitates rich case-studies, which in turn can contribute to making the environmental dimension of security more empirical and therefore more applicable to the political community" (Graeger 1996: 113). As the discussion of security in chapter 1 has demonstrated, security has a multitude of meanings and so speaking about the potential for violent conflict rather than the potential for a negative security situation appears more tangible.

Most authors who use this discourse do not propose that environmental degradation is usually the sole cause of a conflict, for as McNeil and Manwaring (2002: 3) argue "wars, after all, have many fathers." These authors would, however, caution that environmental degradation is often one of the key causes of conflict and to ignore this factor could result in severe ramifications. McNeil and Manwaring (2002: 2) allude to the link between environment

and conflict by describing environmental conflict as "a canary in a coal mine, warning of the danger of conflict or seriously conflictive implications."

Of the three security and environment discourses, the *environmental conflict* discourse is the best known. This discourse has been given traction by two well-known research groups that focus on the potential for resource conflict, the Project on Environment, Population and Security at the University of Toronto (known as the Toronto Group) under the direction of Thomas Homer-Dixon, and the Environment and Conflicts Project (ENCOP) based in Switzerland under Gunther Baechler. Both have been influential in attempting to show that there is a definite link between environmental scarcity, often but not solely caused by environmental degradation, and violent conflict- or the existence of environmental conflict (Dalby 2002a). There are some differences in the focus of the groups, however both conclude that societies with a lack of adaptability will be more likely to face environmental conflict than those that can adapt. Also, both conclude that environmental conflict is likely to be diffuse and subnational (Dalby 2002a). According to Baechler (1999: 85), Homer-Dixon's work "identifies categories of renewables, the degradation of which is supposed to induce violent conflict" while ENCOP "focuses on the historical dimensions of changes in society-nature relationships, addressing the transformation of renewables as a cause of environmental conflicts and wars."

The primary storyline in the *environmental conflict* discourse is the potential for violent conflict over resources. There are several broad trends that "are identified as increasing the likelihood of environmentally induced conflicts, including: expanding and migrating human populations; water, arable land and other resource and environmental scarcities; ...globalisation which brings people (and disease) into closer proximity; and increasing recognition of the

injustice of Northern-induced underdevelopment of the South" (Barnett 2001: 50). Some of these secondary storylines will be addressed below.

Resource availability concerns

A second important storyline in the *environmental conflict* discourse is the role of resource scarcity[8] in fueling environmental conflict. Many scholars who use an *environmental conflict* discourse address the issue of resource scarcity directly in their research. Homer-Dixon (1999) in particular claims that there are some types of scarcity that are so severe that they can seriously undermine human well-being. In other words, some types of scarcity, coupled with other factors, can contribute to violent conflict. Homer-Dixon (1999: 48) identifies three types of scarcities: supply-induced scarcity, demand-induced scarcity, and structural scarcity. Supply-induced scarcity arises through a decrease in the supply of a key resource, demand-induced scarcity arises through an increase in demand for a key resource, and structural scarcity occurs through a change in the relative access of different groups to a key resource. He claims that "[t]he term environmental scarcity...allows us to incorporate in one analysis the three distinct sources of scarcity and to study how they interact with and reinforce each other." He sees this as more desirable than simply focusing on one type of scarcity for analysis.

The fact that there exists resource scarcity in a particular situation does not necessarily mean that conflict will occur. In a discussion of environmental conflict in South Africa, Percival

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[8] Many will point out the subjective nature of the concept of scarcity. Who decides when a particular resource is scarce and when it is plentiful? Are there levels of scarcity? Some of these concerns are addressed in the next chapter on incorporating gender into security and environment discourses.

and Homer-Dixon (1998: 280) argue that context matters when thinking about whether conflict will transpire. They claim

> The context specific to each case determines the precise relationship between environmental scarcity and outbreaks of violent conflict. Contextual factors include the quantity and vulnerability of environmental resources, the balance of political power, the nature of state, patterns of social interaction, and the structure of economic relations among social groups. These factors affect how resources will be used, the social impact of environmental scarcities, the grievances arising from these scarcities, and whether grievances will contribute to violence.

Although Percival and Homer-Dixon make this statement, they do little to include factors other than environmental scarcity into their framework.

While most scholars link conflict to environmental scarcity, there are several other scholars who stress the situation of the abundance of resources leading to conflict (Collier 2000; Fairhead 2000). This view highlights the increase in likelihood of conflict when differing actors see a benefit in capitalizing on a particular, valuable resource. The issue of value here refers to socially constructed value that societies place on resources. For example, while diamonds in and of themselves represent a substance without much use in industry, etc., social ideas about the desirability of diamonds serve to give them a high value. Additionally, several scholars stress the issue of dependence on resources leading to conflict (Bannon and Collier 2003; Le Billon 2001, 2004). The issue of dependence and scarcity as discussed here are closely related. While the underlying conditions may be different within these approaches, the results remain the same- conflict over resources by groups within society. All fit within the discourse of *environmental conflict*.

Population concerns

A third storyline in the *environmental conflict* discourse is a concern that population growth will fuel conflict over resources. For decades, expanding population has been identified as a problem by authors focusing on the environment. Some of the most well known proponents of this argument are Paul and Anne Ehrlich and Garrett Hardin.[9] These authors and others like them have argued that continued human population growth will eventually result in ruin for both humans and the environment (Hardin 1968). The Ehrlichs take the alarmist position that the failure to act immediately to quell the tide of increasing human population will result in a multitude of environmental problems, including acid rain, global warming, depletion of the ozone layer, vulnerability to epidemics, and exhaustion of soils and groundwater (Ehrlich 1993).

Scholars like Choucri (1974: 10) had an early focus on the links between population and conflict, and popularized this storyline. She argued that it was not a simple connection between these two entities. Rather, "the critical elements in any population/conflict calculus might involve less population variables per se than the ways in which population combines with other factors to produce conflictual outcomes." The interactive effects of population dynamics, resource constraints and technological development together influence the likelihood of conflict. It is not so much population size on its own that links to conflict, but rather things like population composition and distribution. Additionally, it is not made clear in the literature whether population growth is likely to have more of an impact on intrastate conflict or interstate conflict. While there is much speculation about whether states will engage in conflict

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[9] These works follow a Malthusian thesis which trace the origins of "want, misery, and war to the relationship between population and resources" (Choucri 1984: 3).

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over territory to support increased population, there is little evidence to support these claims (Tir and Diehl 1998).

Despite these questions, population growth and violent conflict continues to be a visible storyline in the *environmental conflict* discourse. The logic is that as the number of humans in the world grows, the potential damage to the environment grows and at the same time there are more people to compete over scarce resources (Choucri 1974: 182). Homer-Dixon (1994: 5) claims that as human population increases, scarcities in renewable resources will also increase. His argument is that "the total area of high-quality agricultural land will drop, as will the extent of forests and the number of species they sustain. Coming generations will also see the widespread depletion and degradation of aquifers, rivers, and other water resources; the decline of many fisheries; and perhaps significant climate change." According to Homer-Dixon (1999), increases in human populations can directly contribute to both supply-induced and demand-induced scarcities. If these scarcities are combined with other destabilizing factors, the result could be violent conflict. Suliman (1999) adds another concern- that population growth means that there is less available space to move to when degradation occurs, making conflict between dependent populations a possibility.

Human migration concerns

This final point relates to another *environmental conflict* storyline- the forced migration of human populations due to environmental scarcity and degradation as a potential source of conflict. Bennett (1991: 13) focuses on Africa to explain that "drought and land degradation have forced some farmers to resort to smuggling, banditry or migration to survive." When

individuals are forced to migrate because of poor environmental conditions the potential for

conflict increases. The migrating individuals will likely put increased pressure on the natural

resources of the location where they have migrated to, thus another example of a potential

conflict over scarce resources. Although this is a common storyline in the migration literature,

some scholars question whether it is the most important factor to explain resource use. Others

bring up the issue of time horizons, with refugees being temporary users of an area without a

clear stake in the future of the area (Martin 2005). This may also mean that different choices

are made regarding resource use.

Also, as groups migrate because of resource scarcity and environmental degradation,

there is the increased potential for group-identity conflicts (Homer-Dixon 1994; Martin 2005).

These group-identity conflicts could take the form of violent altercations. According to Choucri

(1974: 205)

> The movement of population tends to consolidate both the migrant
> community, making it more cohesive and assertive than it had been earlier,
> and the host community, in opposition to the migrants. Such divisions are
> inevitably aggravated in situations of resource scarcities, or in situations
> where the migrants are more skilled than the host community, thereby
> attracting job opportunities and moving into economic sectors of society that
> the host community does not fill adequately.

This relates to environmental degradation exacerbating existing social, economic or political

tensions within societies. This once again relates to the fact that most who use an

environmental conflict discourse do no argue that environmental degradation or scarcity is the

only source of conflict, but rather than environmental issues, coupled with other existing

factors, can lead to conflict.

Globalization concerns

Another storyline in the *environmental conflict* discourse is the prediction that economic globalization may increase the likelihood of environmental conflict. Increasing production and consumption patterns may lead to resource scarcity and eventual conflict over those scarce resources (Paterson 2001). In addition, some authors see globalization as contributing to the probability of more globalized environmental conflict. Jeong (2001: 6) maintains that

> [E]nvironmental conflict has been globalised as well as regionalized, and its nature reflects an asymmetric relationship between victims and polluters. Activities such as excessive burning of fossil fuels occurring within one state may contribute to national economic growth but negatively affect the welfare of people in other national jurisdictions...Deforestation in the Himalayas has global ecological ramifications beyond catastrophic flooding in Bangladesh.

By this he is implying that as global capitalism spreads, those on the receiving end of increasing environmental degradation may become more aware of the lack of benefits they are receiving at a high cost.

Unequal resource distribution and poverty concerns

An alternative storyline relating to the causes of environmental conflict is unequal resource distribution. Scholars like Walton and Barnett (2008: 4) argue that it is not necessarily supply scarcity or environmental degradation per se that can cause conflict. Rather conflict is caused "by the unequal distribution of outcomes arising from environmental degradation and the processes that cause it." Violence is the outcome when people have no other way to influence the powerful or have their grievances heard. These observations highlight power distributions within society. Scarcity in this context relates to scarcity arising from environmental degradation- yet this does not impact everyone in the same way. The

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disadvantaged of society will suffer disproportionately, and will often lack an outlet to express their frustration at these events. This in turn can lead to violence within society.

Similarly, Homer-Dixon (1991: 109) identifies unequal resource distribution and poverty as other potential contributing factors of environmental conflict. He calls conflict due to unequal resource distribution "relative-deprivation conflicts." He argues that "as developing societies produce less wealth because of environmental problems, their citizens will probably become increasingly discontented by the widening gap between their actual level of economic achievement and the level they feel they deserve." This would amount to a group within a society engaging in conflict as a response to perceived income deprivation. Through the process of "ecological marginalization," unequal resource access concentrated in the hands of a few, in addition to population growth, causes resource depletion and degradation (Homer-Dixon 1994). Groups without access to resources may react to this situation in the form of violent conflict.

As for the case of poverty, Bruyninckx (1996: 88) argues that "[t]here is indeed evidence that poverty forces people to overwork croplands, clear forests, and cultivate arid lands and fragile mountain slopes beyond the threshold of reversible environmental degradation, and all of this for mere survival." Often, being faced with poverty causes individuals to act in the only way available to them even if it means damaging the environment. As individuals faced with poverty degrade the environment out of necessity, they contribute to resource scarcity and possible conflict. In her edited book *Greenwar*, Bennett (1991: 15) includes an interview with a village woman from Burkina Faso in which the woman explains that even though cutting down trees to sell the wood may harm the environment, she does it because she feels that she has no

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other option. She says that "[i]t is for lack of other produce that I sell wood, because at least I am sure that it will be bought and that I will have enough money to provide for my needs." As more and more villagers cut down trees because they have no other alternative for making a living, the resource becomes scarce, the potential for violent conflict increases. Even if these villagers are aware of this risk, their situation limits their options and so they will likely continue to act in an environmentally unsustainable fashion.

Impacts of environmental conflict on states

A final storyline of the *environmental conflict* discourse is the impact of environmental conflict on states. There is often an assumption that the inability of states to effectively deal with environmental conflict may result in a challenge to the state in which these conflicts take place. Choucri (1984: 20) argues that "the capacity of institutions to mediate conflict is intimately tied to the resources available to the various institutions and to the legitimacy of those institutions. If perceived as non-legitimate, intervention by the state to deflect conflict processes can, in actuality, accentuate them." Homer-Dixon (1994: 25) is specific on this point in his research. He argues that "the multiple effects of environmental scarcity, including large population movements and economic decline, appear likely to weaken sharply the capacity and legitimacy of the state in some poor countries." He feels that a continued inability by Southern states in particular to handle environmental degradation and violent conflict linked to environmental degradation will likely result in two possible outcomes. The first is that states may fragment. "Fragmenting countries will be the source of large out-migrations, and they will be unable to effectively negotiate or implement international agreements on security, trade

and environmental protection" (Homer-Dixon 1994: 40). The other possible outcome is that

states will become more authoritarian. "Authoritarian regimes may be inclined to launch

attacks against other countries to divert popular attention from internal stresses" (Homer-

Dixon 1994: 40). This turn to authoritarianism is regarded by many to further environmental

damage, since it is often supposed that democratic regimes are better for environmental

protection (Midlarsky 1998).[10] These observations highlight the fact that the *environmental*

conflict discourse pays particular attention to the impact that conflict has for the stability of

states. This discussion of the role of actors in security and environment discourses will be

expanded on below in the section comparing these discourses to traditional security ideas.

Environmental conflict and the Global South

Most of the scholars who use an *environmental conflict* discourse focus their analysis on

states and regions in the Global South. Issues like population increases and migration, as well as

unequal resource distribution and poverty concerns are often identified as being of particular

concern for states in the "developing world." Walton and Barnett (2008: 3-4) explain that

> [E]nvironmental conflicts are more likely to be violent in developing countries
> given that: people are generally more dependent on natural resources for
> livelihoods, so that changes in the relative abundance of these resources is
> often a matter of survival; and that states in developing countries do not have
> effective systems for mediating impending conflicts before they turn violent
> and struggle to manage environmental degradation and change.

Many authors who use an *environmental conflict* discourse specifically address Southern

states in their work, often by using the case study method. Homer-Dixon (1991: 78) argues that

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[10] However, through statistical indicators Midlarsky (1998) finds that there is no uniform relationship
between democracy and the environment.

Southern states are more likely to be vulnerable to resource conflict problems than Northern states. He speculates that in the Global South "a range of atmospheric, terrestrial, and aquatic environmental pressures will in time probably produce, either singly or in combination, four main, causally interrelated social effects: reduced agricultural production, economic decline, population displacement, and disruption of regular and legitimized social relations." These social effects may in turn lead to violent social conflict.

One of the main reasons that the South may be more vulnerable to environmental conflict is that many Southern states lack the economic and technological resources to deal with environmental degradation. An example is the issue of water contamination; the process of reversing water contamination is extremely expensive and technologically complex, when possible at all (Biswas 2000). Many Southern states lack these resources and are often at a severe disadvantage to avoid conflicts that emerge due to inadequate water supplies. As potable water supplies become more difficult to find, conflict may erupt over the supplies that do exist.

In addition, some Southern states may be pressured domestically or internationally to invest limited economic resources in areas other than the prevention or correction of environmental degradation. Ba (1991) highlights the case of Mauritania's development strategies and argues that many top-level officials do not consider protection of the environment or its clean up as a key priority of the country. Instead, the government of Mauritania is more likely to yield to the demands of foreign investors, who may not have the environment's best interest in mind, in the hopes of developing the state economically.

Closely related to this is the issue of the high levels of poverty amongst the populations of the Global South. As was discussed above, high poverty levels are commonly thought to be a contributing factor to environmental conflict. According to Mohammed (1997: 137), "poor people put pressure on the local environment for survival, which results in environmental degradation and competition over natural resources, leading to social tension and armed conflict. Higher military spending follows, with substantial economic costs, which leads to increased poverty." This demonstrates the assumption that environmental conflicts are cyclical in nature. Southern states typically have limited economic resources and may be forced to invest them militarily in the hopes of quelling environmental conflict. However, this does nothing to prevent future environmental conflict if investments are not made to combat environmental degradation.

Another issue that is particularly salient for Southern states is the religious, ethnic and ancestral meanings that the environment has for many local populations. In many states, the environment is intricately linked to religious conceptions and practices as well as having ethnic or cultural significance. The process of environmental degradation and increasing commodification of the environment undermines these meanings. The commodification of the environment can often have the effect of taking nature from the level of the sacred to that of the profane. It becomes something that can be bought or sold, or something at the mercy of a market (Cronon 1996). This process can be stressful in its undermining religious conceptions and may result in social conflict (Bruyninckx 1996).

Critiques of the environmental conflict discourse

Since the *environmental conflict* discourse is the most well-known of the three security

and environment discourses, it is not surprising that work using this discourse has had its fair

share of critics. Gleditsch (1998: 381) has produced an often cited critique, which presents nine

charges against scholarship that uses the *environmental conflict* discourse.

> Most scholarship on the relationship between resources, the environment,
> and armed conflict suffers from one or more of the following problems: (1)
> there is a lack of clarity over what is meant by 'environmental conflict'; (2)
> researchers engage in definitional and polemical exercises rather than
> analysis; (3) important variables are neglected, notably political and economic
> factors which have a strong influence on conflict and mediate the influence of
> resource and environmental factors; (4) some models become so large and
> complex that they are virtually untestable; (5) cases are selected on values of
> the dependent variable; (6) the causality of the relationship is reversed; (7)
> postulated events in the future are cited as empirical evidence; (8) studies fail
> to distinguish between foreign and domestic conflict; (9) confusion reigns
> about the appropriate level of analysis.

His methodological critique of the literature is one of the most frequently repeated by critics.

The large-N study conducted by Hauge and Ellingsen (1998) is one of the only of its kind within

the literature, with most other work focusing on case studies of when violent conflict occurred

and resources were involved.[11] Gleditsch (1998) concludes that pointing out flaws such as these

is important to stimulate more satisfactory research in the field. This implies that he still sees

something positive coming out of a linkage between security or conflict and the environment.

Likewise, Lodgaard and Westing "claim that linking the environment to security- and thereby to

'high politics'- has created the political awareness and sense of urgency required to resolve

environmental problems and increase our security" (quoted in Graeger 1996: 109).

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[11] There have been a few other attempts to empirically test the logic behind elements of the
environmental conflict discourse. For example, Choucri (1974) tests propositions put forward in the literature on
population and conflict. However, there are few studies that test multiple elements of the discourse.

This view is challenged by Deudney (1990: 189) who argues against linking security and environment. He claims that "it is analytically misleading to think of environmental degradation as a national security threat because the traditional focus of national security- interstate violence- has little in common with either environmental problems or solutions." This position is echoed by those who are skeptical of environmental issues moving from the realm of "low politics" to that of "high politics" (Barnett and Dovers 2001). Buzan et al (1998) warn against the move to high politics, saying it represents an undesirable "securitization" of the environment that limits the range of means available for resolving environmental problems. They argue that in the long run, environmental conflict is more likely to be avoided if it is made part of the daily political debate (Graeger 1996). Similarly, Levy (1995) argues that the link between the environment and security concerns may have made sense just after the Cold War when environmental awareness was rising among publics, but it is not as essential once some of that enthusiasm has worn off. Like Buzan and Wæver, he claims that some environmental problems are better dealt with on their own. He points to the example of ozone depletion as demonstrating that many environmental issues are better dealt with in the realm of "low politics" rather than linking them to security (Levy 1995). He sees a need for scholars to focus on what causes regional conflict much more than looking at environmental causes of conflict.

Many scholars are specifically critical of the dominance of Northern ideas within the *environmental conflict* discourse. Barnett (2001: 50) claims that "[t]here is little if any evidence to suggest that environmental problems do cause violent conflict; instead what is presented are theories that have intuitive appeal but empirically fail to convince. Despite this, the environment-conflict thesis influences national security discourse and subsequent policies in

important ways, particularly in the United States." Barnett goes on to censure the literature's focus on the South as the likely location for environmental conflict. He claims there are "ethnocentric assumption that people in the South will resort to violence in times of resource scarcity" (Barnett 2001: 53). He argues that it is rarely supposed that societies in the North will engage in environmental conflict. "There is continued scripting of people from the South as barbaric, strongly implying that those in the North are more civilised" (Barnett 2001: 53). He feels that the result of this process is that the North feels compelled to maintain order within the South. Similarly, Swatuk (2006: 209) sees the *environmental conflict* discourse as being primarily concerned with "the implications of environmental degradation in the global South for security of states in the global North."

In sum, the *environmental conflict* discourse is dominated by a concern that humans will engage in violent conflict over natural resources. Some of the secondary storylines of this discourse revolve around the causes and sources of these conflicts over resources. These secondary storylines include resource availability, population concerns, human migration concerns, and unequal resource distribution/poverty concerns. A final storyline of this discourse is the impact of environmental conflict for the state.

Environmental Security

The *environmental security* discourse is generally concerned with the negative impacts of environmental degradation for the security of humans.[12] Barnett (2001: 129) describes this set of ideas as "the process of peacefully reducing human vulnerability to human-induced environmental degradation by addressing the root causes of environmental degradation." While the *environmental conflict* discourse can still directly be linked to military security, *environmental security* is much more closely linked to notions of "human security." Human security is a conceptualization of security that has the protection and insurance of human welfare as its central concern. A 1994 United Nations Development Programme (UNDP) report outlines seven areas of human security: 1) economic security, 2) food security, 3) health security, 4) environmental security, 5) personal security, 6) community security, and 7) political security (Smith 2005). The UNDP report also identifies six main threats to human security: 1) unchecked population growth, 2) disparities in economic opportunities, 3) migration pressures, 4) environmental degradation, 5) drug trafficking, and 6) international terrorism. As these components suggest, human security rejects the state-centric nature of traditional security concerns and is concerned with the health and well-being of individuals and communities.

In the *environmental security* discourse, the security threat is located in the negative consequences of environmental damage and those who are vulnerable are all human beings (Dalby 2002a). That being said, this is also an anthropocentric discourse since it is

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[12] The Woodrow Wilson International Center's Environmental Change and Security Project (ECSP) is an organization whose research largely fits into the *environmental security* discourse. According to the organization's publications, ECSP focuses on "the connections among environmental, health, and population dynamics and their links to conflict, human insecurity, and foreign policy" (ECSP 2007: iii).

overwhelmingly concerned with the security of humans rather than the environment. In general, this discourse is broader than the *environmental conflict* discourse because of its concerns and foci, as is seen through the different storylines that make up each discourse.

Environmental Security Storylines

In general, the *environmental security* discourse represents a resurgence of storylines presented in early environmental politics scholarship. The primary storyline in this discourse is a concern about negative environmental impacts on human health and security. The secondary storylines include the environmental impact of accelerating globalization, concerns over population increases, the spread of disease, the potential for sustainable development, and environmental peacemaking.

Negative environmental impacts on human health

The primary storyline in the *environmental security* discourse is the negative impacts of environmental change for human health. This set of concerns is often discussed in terms of human vulnerability to global environmental change (Adger 2006; Eakin and Luers 2006; Liverman 2001; Vogel and O'Brien 2004). Liverman (2001: 202) explains that "vulnerable people and ecosystems lack the strength to resist pests, diseases, and hunger; they may be unable to move away from danger; or they may not have access to the resources needed to provision or defend themselves." Those who are vulnerable are more easily wounded and recover more slowly than those who are not. This literature calls attention to the fact that people will experience environmental change differently depending on current and historical patterns of

resource allocation and the complex feedbacks inherent in coupled human-environment

systems (Folke 2006; O'Brien and Leichenko 2000). According to Barnett et al (2008: 104)

> Almost all vulnerability studies share an explicit concern for losses that
> directly relate to human welfare, in terms of damage to property, damage to
> livelihoods, forced migration, morbidity, or mortality, for example. Integral to
> this research...is the recognition that vulnerability is not equally distributed
> throughout a population exposed to risk. A raft of studies show that
> sensitivities to damage, capacities to respond, and the outcomes of
> environmental change are vastly differentiated according to class, gender,
> ethnicity, and location, and that there are winners and losers from
> environmental change.

This demonstrates the direct link between human security and environmental change that is

assumed in the *environmental security* discourse. As was the case with the *environmental*

conflict discourse, the secondary storylines of the *environmental security* discourse relate to the

primary storyline- the negative impacts of environmental change on human security. These

secondary storylines include concerns about accelerating globalization, increases in population,

spread of disease, natural processes, the promise of sustainable development and the potential

for environmental peacemaking.

Accelerating Globalization

One secondary storyline in the *environmental security* discourse is accelerating

globalization. While economic globalization was also a storyline in the *environmental conflict*

discourse, there is a different focus on the elements and consequences of globalization for the

environmental security discourse. Within the *environmental security* discourse, globalization is a

focus due to its eventual negative relationship to human security, which can manifest itself in a

variety of ways. Although globalization is by no means a new phenomenon, the rapidity at

which it seems to be currently progressing has gotten the attention of many scholars. The *environmental security* discourse contains a concern about globalization largely because it is frequently asserted that increases in globalization lead to increases in global capitalism. This in turn leads to increases in production and consumption, often to environmentally unsustainable levels. These increases in production and consumption ultimately lead to a decrease in environmental quality (Dauvergne 2008; Mol 2003). Unsustainable consumption patterns place high levels of stress on the environment in the forms of resource extraction, waste products, and pollution (Princen et al. 2002). This environmental degradation that is seen as accompanying globalization may lead to a variety of negative impacts on human beings.

Pirages and DeGeest (2004) address the impacts of globalization by pointing to its facilitation of greater movement between cultures and, more importantly, ecosystems. These authors claim that "[t]he dynamics of globalization are bringing together peoples and ecosystems that were once comfortably buffered from each other by physical, political, and cultural barriers. A rapidly moving flow of people, animals, plants, products, information, and ideas across borders is producing a planetary mingling of species and cultures with uncertain consequences" (Pirages and DeGeest 2004: 1). The authors see the increasing spread of global capitalism as facilitating greater levels of production and consumption to the detriment of both the environment and human beings.

> Economic globalization is closely tied to ecological globalization. The growth of worldwide commodity markets facilitates ecological imperialism, pollution, and destruction of ecosystems in poor countries in order to maintain high consumption levels in rich ones. Furthermore, large numbers of people and significant quantities of agricultural commodities and raw materials are increasingly in motion around the world, facilitating the unintended spread of plants, pests, and microorganisms into new ecosystems. (Pirages and DeGeest 2004: 8)

Pirages and DeGeest are not concerned about the potential for violent conflict over scarce resources caused by globalization, but rather are focused on a variety of consequences of globalization including the spread of disease and biodiversity loss. Globalization allows human beings and other living things to travel far out of their traditional or natural habitat with sometimes harmful effects. This once again demonstrates that *environmental security* is a broader discourse than the *environmental conflict* discourse.

Barnett (2001) uses the globalization storyline in his discussion of *environmental security*, however he focuses more on its often unbalanced impacts on different parts of the world. Barnett (2001: 123) claims that accelerating globalization has heightened the insecurity of groups of people who live in an environment that has been damaged to the point where they can no longer predictably extract necessary resources for survival, and also those who are "increasingly unable to control the economic environment which determines the provision of their most basic needs." He implies that both of these groups are disproportionately found in the Global South rather than in the North. The inclusion of economic factors as well as environmental factors in Barnett's analysis once again points to the broad nature of the *environmental security* discourse which includes a variety of aspects of human security.

Increases in Population

Much like the *environmental conflict* discourse, the *environmental security* discourse includes a concern about the continuing increases in the global population for its potential to create environmental damage. The world's population has doubled from three to six billion since the early 1960s and is predicted to reach eight billion over the

next quarter century (Pirages and DeGeest 2004). Many argue that population increases coupled with increases in resource demands accompanying industrial growth places strenuous burdens on the global ecosystem. In an examination of the population levels of Ethiopia, Worku (2007: 2) claims that the country's increased population level "has accelerated land degradation at an alarming rate, as forests are converted to farms and growing numbers of households use unsustainable agricultural methods to eke out a living on marginal land." This suggests that population pressures can force individuals to engage in environmentally unsustainable practices out of necessity.

Pirages (1997: 38) identifies four elements as necessary to ensure environmental security, two of which deal with levels of human population.

> Ecological security[13] for human beings has been maximized when the following four kinds of equilibriums have been maintained:
> 1) Between the demands of human populations and the sustaining capabilities of environmental systems;
> 2) Between the size and growth rates of various human populations;
> 3) Between the demands of human populations and those of other species;
> 4) Between human populations and pathogenic microorganisms.

While this list appears not to necessarily privilege humans over the environment, his overall arguments are geared toward achieving environmental security for humans. He also argues that if current population trends continue, human beings will run up against ecosystem carrying capacities which could contribute to environmental degradation, vulnerability to disease and to violent conflict (Pirages 1997). Population pressures could also increase the desirability of migration in order to seek resources elsewhere,

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[13] Pirages (1997) uses the term "ecological security" to refer to the set of ideas that I identify as the environmental security discourse. The storylines that Pirages uses in his work are very similar to the environmental security storylines that I identify in this chapter. This demonstrates that within discourse analysis, it is not necessarily the individual words that are important, but rather the meaning behind the words.

leading to other negative consequences such as those discussed in the *environmental conflict* discourse. Pirages also claims that differential levels of population growth could have further complications for human beings as well as the environment. He argues that "differential population growth rates, such as those between certain Islamic states and their neighbors, often lead to conflict and provide pressure leading to large-scale population movements" (Pirages 1997: 38). Arguments such as this demonstrate the fact that the *environmental security* discourse incorporates elements of the *environmental conflict* discourse, while also adding new dimensions, like security threats to humans that stem from sources other than direct conflict.

There is a tendency to be more reflexive about the link between population and environmental degradation in this discourse. For example, Dalby (2002a: 87) claims that

> Population is related to environment in numerous ways, but the relationships are mediated by complex social and economic arrangements that need detailed attention. While population increase is a factor of importance in many locations, it is not necessarily a cause of either environmental degradation or acute conflict in many places, including Rwanda, where simplistic generalizations incorrectly specify population increases as a major cause of environmental degradation and conflict.

While Dalby is sympathetic to many of the ideas of the *environmental security* discourse, his goal is to problematize some of the concepts in the discourse (Dalby 2002a). He suggests that scholars look at the specific context of population increase, such as increases in urban populations, rather than making general statements about population. Dalby claims that increases in urban populations often results in resources being drawn from rural areas which disrupts indigenous populations (Dalby 2002b).

Spread of disease

The connections between the spread of disease as a human security threat and environmental change is an additional *environmental security* storyline. There is an argument that increases in population and increases in the mobilization of populations are central to understanding recent outbreaks of disease. Some may question how exactly this relates to the environment. Remember that if the environment is broadly conceptualized, then microorganisms could be thought of as an essential element of an ecosystem, and thus changes in the presence or absence of these microorganisms could fundamentally alter the ecosystem. If the changes to an ecosystem have adverse effects on human populations, then this constitutes an *environmental security* concern.[14] Again, this represents a difference between the *environmental security* and *environmental conflict* discourses- the conceptualization of "environment." The *environmental security* discourse discusses environment in broad terms to include environment as where we live.

Pirages (1996: 9) is one scholar who utilizes this storyline extensively in his research. He explains the situation thusly:

> Human beings and these small organisms, some of which are very pathogenic, have coevolved over time in a shared environment. Disease microbes have temporarily gained an upper hand at various times in history and the resulting plagues have wiped out large numbers of human beings. The populations that have emerged from these periodic ravages of disease have, for the most part, been immune to future attacks. Thus, our genetic heritage has been shaped by continuous interaction with the microbial world. When human populations encounter 'novel' pathogenic

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[14] The key is that the connection is being made between disease and human security. There are other disease-security links that scholars have made. For example, Price-Smith (2002) argues that there is a link between the spread of disease and national security. This represents an *environmental conflict* argument since the concern is for the security of the state, and not human populations.

organisms, however, naïve bodies have few defenses and significant
deaths result.

As human populations travel and are exposed to new disease microbes, the potential for

outbreaks of disease increase substantially. Pirages uses the occurrence of increased numbers

of humans moving into the Amazon in Latin America and tropical rainforests in Africa as an

example of humans being exposed to microorganisms to which they have no natural tolerance

against (Pirages 1996).

Another element of this storyline is the spread of water-borne and vector-borne

disease, which can be worsened by environmental change. Discussions of climate change often

include this storyline. For example, McMichael (2003: 554) says that

> Infectious vector-borne diseases (VBD) are generally sensitive to climatic
> conditions. The breeding, life-cycle and survival of various vectors are
> constrained by temperature, humidity and, often, surface water. Similarly, the
> maturation and replication of the infectious agent within the mosquito, tick or
> other vector organism is typically very sensitive to temperature, accelerating
> at higher temperatures. While these ecological processes are complex, and
> are modulated by other environmental influences, most of the modelling
> studies indicate that climate change would induce an increase in physical
> range and seasonality of diseases such as malaria and dengue fever.

This is similar to discussions of water-borne diseases after natural disasters like floods and

hurricanes.[15]

Natural processes

An additional *environmental security* storyline is the impacts of natural processes for

human security. This focus on natural processes represents an additional difference between

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[15] This phenomenon will be discussed further with regard to flooding in the Ganges-Brahmaputra-Meghna
water basin in chapter 5.

the *environmental security* and *environmental conflict* discourses. While the *environmental conflict* discourse views the environment largely in terms of natural resources for human consumption, the *environmental security* discourse conceptualizes the environment in broader terms, as something that can present a security threat to human beings on its own. There is a difference in the location of security threats in these two discourses.

Natural disasters or biophysical changes like changes in precipitation levels, the growth or decline of species populations, or changes in levels of pathogenic microorganisms, can also contribute to environmental insecurity for humans (Pirages and DeGeest 2004). This is particularly the case with regard to water issues across the globe. Since both humans and ecosystems rely on water to survive, shifts in amounts of water have major implications for human security (Conca 2005; Dimitrov 2002). Shortages of water or droughts have a direct negative impact in terms of lack of access, but they also contribute to food security issues because agriculture demands water supplies (Postel 1997). Additionally, too much water in the form of flooding brings destruction and negative human consequences (Shamim 2008). It is important to note that many of these natural processes can also be worsened by the human behaviors discussed above.

Sustainable development

The sustainable development storyline enters the *environmental security* discourse as a means of avoiding the environmental damage that can lead to environmental insecurity for humans. This often includes a discussion of the human security of future generations as part of discussions of environmental security. The notion of sustainable development is frequently

incorporated into such a discussion. The term "sustainable development" came out of The

World Commission on Environment and Development's *Our Common Future* (1987). In this

work, sustainable development is defined as "development that meets the needs of the

present without compromising the ability of future generations to meet their own needs"

(World Commission on Environment and Development 1987: 9). It is essentially a call to

recognize that many natural resources are finite and must be used in such a way that they are

protected for current as well as future use. There is a sustainability component in this

conceptualization as well as a development component. The sustainability component

maintains that if resources are utilized in an unsustainable fashion, environmental degradation

may impair the ability of future generations to enjoy the same lifestyle as the present

generation. The development component recognizes the goal of economic development,

particularly by states in the global South.

It is argued that a transition to a more sustainable world is a necessary step in ensuring

environmental security. For example, Pirages and DeGeest (2004: 204) claim that this transition

to sustainable development "must be a continuing process that requires change in values,

institutions, and technological innovation." This transition would include elements of equality

between generations as well as between the Northern and Southern countries as we know

them today. They also caution that market forces cannot be relied on to guide this type of

transition, so there must be action on the part of states to ensure that this type of sustainable

world may one day be reached. Likewise, Amorim (2005: 3) argues that "[e]ven as we refine our

understanding of the questions related to human and environmental security, we should

always bear in mind that, in the end, we must go back to the ultimate aim of promoting

sustainable development on a global scale. In order to do this, we must create a new paradigm

of international cooperation that takes into account the new global challenges and realities."

Environmental Peacemaking

Another storyline in this discourse that relates to avoiding environmental insecurity is

environmental peacemaking. Environmental peacemaking refers to a link between

environmental issues and cooperation (Rogers 1999; Swatuk 2006). This set of ideas assumes

that while environmental problems may contribute to conflict, they may also generate

incentives for cooperation and collective action. Ken Conca (2001: 226) claims that "[i]f

environmental degradation can trigger violent conflict, then perhaps environmental

cooperation can be an equally effective catalyst for reducing tensions, broadening cooperation,

fostering demilitarization, and promoting peace."[16] This increased cooperation can result in

lessening environmental degradation and avoiding environmental insecurity for humans.

Conca and Dabelko (2002: 10-11) have been instrumental in popularizing this storyline.

They state that in order for a strategy of environmental peacemaking to work, it must first

"create minimum levels of trust, transparency, and cooperative gain among governments that

are strongly influenced by a zero-sum logic of national security." Second, it must "lay the

foundation for transforming the national-security state itself, which is too often marked by

dysfunctional institutions and practices that becomes further obstacles to peaceful coexistence

and cooperation." These are no small tasks. Conca warns that environmental cooperation does

not occur automatically or easily, and that there may be substantial conflicts of interests or

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[16] Conca is largely concerned with cooperation at the international level rather than the subnational level, which may have different dynamics.

differences in perception that may make environmental cooperation more difficult- but this does not mean it is an impossibility. His main argument is that "environmental problems frequently have properties- ranging from technical complexity, uncertainty, and longer time horizons to the particular interdependencies they create- that may lend themselves to peace-enhancing types of cooperation" (Conca 2001: 228). He lists the increases of international environmental agreements, collaboration between national environmental bureaucracies, environmental reforms in intergovernmental organizations and increases in transnational networking between environmental organizations as examples of collective action already underway (Conca 2001).

In sum, the *environmental security* discourse is centrally concerned with the negative impacts of environmental degradation for human security. Like *environmental conflict*, this is also an anthropocentric discourse, with humans as the central concern. Some of the secondary storylines in this discourse relate to factors that increase the chance of environmental insecurity. These include accelerating globalization, increases in population, the spread of disease, and natural processes.[17] Sustainable development and environmental peacemaking are storylines that relate to measures that can be taken to avoid environmental insecurity.

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[17] This set of secondary storylines are important, because they set the terms of the debate by acting as potential targets to combat environmental insecurity. As was the case in the *environmental conflict* discourse as well, these storylines have the potential to greatly influence policy debates if they gain salience. This issue will be elaborated further in the next chapter with regard to the gendered implications of this targeting.

Ecological Security

Whereas the focus for the *environmental conflict* and *environmental security* discourses is on human beings as the vulnerable party in a link between security and the environment, *ecological security* focuses on the environment itself as that which is vulnerable. The main concern is about the protection or security of the environment from human-induced phenomenon. This is essentially an ecocentric framework. Many scholars claim that because this discourse is noticeably different from either of the security and environment discourses discussed above, authors should take care to distinguish between these different frameworks when writing (Barnett 2001). The *ecological security* discourse has evolved in much of the same timeframe as both the *environmental conflict* and *environmental security* discourses; however there are fewer scholars who adopt an *ecological security* point of view.

Ecological Security Storylines

The primary storyline in the *ecological security* discourse is a concern about negative impacts of human behavior for the health or security of the environment. Rogers (1997: 30) explains that ecological security refers to "the creation of a condition where the physical surroundings of a community provide for the needs of its inhabitants without diminishing its natural stock." Swatuk (2006: 217) explains that for the *ecological security* discourse, "security is about securing environmental health (within specific ecosystems; or at the level of the planetary biosphere) and, by extension, human well-being for humans are part of the biosphere, not separate from it. To ensure this 'security' requires a holistic understanding of

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the ways in which humans interact with 'nature'." Secondary storylines that relate to this theme include evaluating the relationship between humans and environment, and challenging "traditional" conceptualizations of security.

Relationship between humans and environment

A secondary storyline that relates to the primary storyline is the relationship between humans and the environment. The *ecological security* discourse is ecocentric, meaning that it is Earth-focused. This discourse presents a very different way of viewing "nature" when compared to the previous discourses. Items like water, fertile soils and fossil fuels would not be seen by *ecological security* scholars as "resources" available for human consumption, but rather as other parts of the environment. In this approach species and ecosystems are preserved for their own sake, not for their value to humans (Litfin 1999). In an ecocentric perspective, "the nonhuman world is considered to be valuable in and of itself and not simply because of its obvious use-value to humans" (Fox 1993: 1). There is an assumption in this discourse that human beings constitute one part of the environment, but are not a necessary component in all ecosystems. The *ecological security* discourse does not privilege humans as the most important species. Humans are seen as one part of the whole system that is the environment, and as actors that have been responsible for environmental change.

Ecological effects of war and other military preparations

Another secondary storyline in this discourse is challenging traditional notions of security, particularly the impacts of war and military preparations for the health of the

environment. The *ecological security* discourse highlights the destruction to the environment that has historically stemmed from traditional conceptions of security. There is a focus on the fact that as both states and sub-national actors have engaged in conflict over the years, the environment nearly always suffers. It has long been noted that warfare negatively impacts the environment. Whether directly or indirectly, warfare tends to cause environmental degradation (Westing 1990). Paterson (2001: 44) addresses the environmental effects of war by claiming that "the environment has been an instrument and a casualty of warfare itself, as strategists have used and abused ecosystems to give themselves military advantage." For centuries, military personnel have directly targeted the environment during combat, usually at an extremely high price to surrounding ecosystems. As military technology has advanced, the potential damage to the environment has also increased. The most powerful example of this may be "nuclear winter" that scientists contend would follow extensive nuclear war (Stone 2000).

The Vietnam War has been publicized as an example of the devastating environmental effects of modern military technology (Austin 2000). The United States military undertook a massive defoliation campaign in order to prevent the growth of groundcover using eighteen million gallons of toxic chemicals such as Agent Orange, Agent Blue and Agent White (Hastings 2000). In addition, there were attempts to alter weather patterns through cloud seeding over North Vietnam in order to impair enemy troop movements and conceal US bombing missions (Austin 2000). In the years since the Vietnam War, the damaging effects of environmental warfare on both the environment and the human population have become apparent through

environmental stagnation as well as high numbers of birth defects, diseases, and premature death- all connected to exposure to toxic substances (Jacoby 2000).

More recently, "the 1990-91 Gulf War may have seen the most concerted effort to destroy an enemy's environment, as Iraqi troops detonated more than 700 Kuwaiti oil wells, igniting over 600 of them. Smoke from the fires created black rain in Iran and Turkey, and possibly extended as far east as India" (Austin 2000: 2). Damaged oil wells have created oil lakes which have seeped through the desert soil and contaminated the water sources. Crude oil dumped directly into the Gulf by Iraq in order to hinder amphibious landing has devastated the Gulf's marine environment as well as severely damaging the population of migratory birds that were caught in oil slicks and lakes (Austin 2000). On the side of the Coalition forces, largely United States forces, "the region is now littered with as much as 300 tons of armor-piercing depleted uranium ammunition" (Austin 2000: 3). The Coalition forces also targeted environmental infrastructure such as sewage treatment plants as a part of their bombing campaign (Austin 2000). The most recent war in Iraq has had little documentation as far as recording the environmental impacts, but it is likely that severe environmental damage has occurred in the course of the war.

Not all violent conflict or war impacts the environment in the same way. There are several factors that determine the total environmental damage caused by a specific war. These include "the type of war (conventional, biological, chemical, or nuclear); the type of weapons and extent to which they are used; the duration and intensity of the war; the extent and type of terrain over which the war is fought; the strategies used during the war; and the prewar environmental conditions" (Biswas 2000: 303). Biswas (2000) identifies several potential

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environmental impacts of war. Among these are impacts on land, impacts on water, impacts on air quality, noise pollution, resource depletion, and the effects of hazardous materials. Each of these various impacts is increased by the use of nuclear, biological or chemical weapons.

Apart from the negative environmental impacts of conflict, the *ecological security* discourse includes a criticism of the level of autonomy that military departments and cabinets have in countries around the world. In the case of the United States, The US Environmental Protection Agency lacks clear authority to oversee Department of Defense practices and has no authority to police overseas facilities. In addition, the Pentagon has lobbied for statutory exemption from the Clean Air Act, Endangered Species Act, Marine Mammal Protection Act, Migratory Bird Treaty Act and federal toxic waste laws (Ecologist 2003).

When states have military installations in other areas of the world, as is the case with the United States, there is often little pressure to ensure environmental sound practices. Siegel (1996: 16) claims that

> The official position of the US government is that it is not generally obligated to clean up hazardous wastes at foreign military bases unless there is an 'imminent and substantial endangerment to human health and safety.' In fact, only when it is obligated by treaty or a 'Status of Forces Agreement' does it take action against other hazardous wastes. In no foreign country, however, has the Pentagon systematically identified contamination sites, as it has within the US and its territories.

This behavior is harmful to ecosystems, whether or not they are actually located within US state boundaries.

In sum, the primary storyline of the *ecological security* discourse is the negative impacts of human behavior for the environment. Secondary storylines in this discourse include rethinking the relationship between humans and the environment, and challenging traditional

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conceptualizations of security. Of the three security and environment discourses presented

here, ecological security is the sole ecocentric discourse meaning that this discourse is

concerned with the vulnerabilities of the environment rather than humans.

Comparing Environmental Conflict, Environmental Security, and Ecological Security to Traditional Security Concerns

Since security remains one of the most fundamental concepts in IR and foreign policy, it

is useful to examine how the three discourses outlined above compare to traditional security

concerns. Additionally, having a sense of how these discourses relate to traditional ideas of

security can shed some light on how far these discourses are removed from mainstream

security notions, which will give us an idea of whether they would be more or less amenable to

the inclusion of gender concerns. As I will discuss in the next chapter, security scholarship and

policymaking has been very slow to recognize gender concerns (Tickner 1997). Evaluating the

relationship between the three security and environment discourses and traditional security

ideas will help to both set up the discussion for the remainder of the dissertation, as well as

illuminate some of the distinctions between the three discourses. In order to do this, I examine

the actors involved, the different sources of threats and vulnerabilities identified, and the

degree of intentionality involved. Table 1 contains a summary of these discussions.

Traditional ideas of security have dominated the field of IR since the end of World War

II. The centrality of traditional security places greater pressure on security and environment

discourses to break the discourse domination of traditional security. This is particularly the case

for *environmental security* and *ecological security* discourses in which fundamental aspects of

traditional security are challenged. With regard to *environmental security* specifically, Pirages

and DeGeest (2004: 19) claim that "the security paradigm that has evolved over time has

emphasized the use of military force to protect power and privilege while mostly ignoring...less

well understood, but often more serious, ecological threats to human well-being. They have

been seen as matters better addressed through prayer than defense spending." *Ecological*

security concerns have similarly been largely ignored by security scholars and policy-makers

alike. Rather than simply reform traditional security, some claim that these discourses actually

represent a challenge to it (Barnett 2001).

Table 1. Comparing traditional security to *environmental conflict, environmental security* and *ecological security* discourses.

	Traditional Security	Environmental Conflict	Environmental Security	Ecological Security
Actors Involved	-Mainly the state	-The state -Sub-state actors	-The state -Sub-state actors -Supra-state actors	-The state -Sub-state actors -Supra-state actors
Threats	-Human death and destruction due to military action	-Human death and destruction due to military action	-Wide variety of threats to humans due to environmental factors	-Destruction and damage to the ecosystem
Source of Threats	-State actors -Occasionally non-state actors	-Sub-state actors -Occasionally state actors	-Human behavior -Natural processes within the environment	-Actions of human beings
Who or What is Vulnerable	-State and its citizens	-Sub-state populations or state citizens	-All human beings	-Ecosystem as a whole
Degree of Intentionality	-High	-High or low	-High or low	-High or low

Who are the actors involved?

Traditional security scholars are concerned with threats by a purposive actor to the physical safety and survival of a target and the underlying vulnerabilities which make such threats possible or attractive. These scholars view the main target involved as well as the actor who inflicts harm as the state (Page 2002). Thus, traditional security is often used interchangeably with "national security." A state's military community is typically concerned with the military actions of other states, and occasionally other non-state entities such as terrorist organizations. Interestingly, even when terrorist organizations are identified as being a source of insecurity for a given state, the response may still be to target a state actor. An example of this was seen in the United State's response to the terrorist attacks on September 11, 2001. Rather than specifically target al Qaeda, the US first targeted Afghanistan. According to noted realist and IR scholar Kenneth Waltz (2002: 349), "[a]lthough terrorists can be terribly bothersome, they hardly pose threats to the fabric of a society or the security of the state." This highlights the centrality of the state in most concepts of security. Since Waltz views terrorists as unlikely to undermine the security of a state, then they are not viewed as serious threats to security.

Among scholars who use the *environmental conflict* discourse, there is some disagreement as to whether environmental conflict is more likely to involve states as actors, or to involve smaller groups in conflict with one another. Authors like Homer-Dixon (1994) feel it is not necessarily states that will engage in environmental conflict with one another, but instead it is groups within states that are more likely to conflict. However, he does maintain that if states do engage in environmental conflict, it is likely to be over non-renewable resources such as oil

and mineral resources. This focus on non-state actors serves as a challenge to the state-centric notions of traditional realist notions of security.[18]

As one goes across Table 1, the role of the state shifts from that of the main target or actor who exploits vulnerabilities to the state as the actor responsible for solving environmental problems. This shift becomes apparent when the state as an actor is examined in the *environmental security* and *ecological security* discourses. The state is seen to play a variety of roles by *environmental security* scholars. The state is seen by some to be a necessary component for providing environmental security for its citizens, at least in the short-term (Barnett and Dovers 2001). However, some also claim that solutions need to look beyond the state for providing environmental security. Pirages and DeGeest (2004: 230) argue that in order to move closer to environmental security we must "develop new institutions beyond the state level to cope with the rapid pace and expanding scope of globalization. New forms of governance are vitally important to the maintenance of health and order in this increasingly interdependent global system."

Additionally, both the *environmental security* and *ecological security* discourses point out the negative impacts that many state policies have for the environment. These policies include the activities of state militaries around the world, an element of the *ecological security* discourse in particular. Militaries around the world are responsible for major environmental damage, both through war-time and peace-time activities (Liotta and Shearer 2007; Paterson 2001). Other environmentally unsustainable state policies include neoliberal trade policies that perpetuate economic globalization (Paterson 2001).

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[18] Admittedly, there is work done within a traditional security framework that looks at civil conflict. My point is that much of the work in this area is heavily dominated by a state-centered perspective.

Ecological security is the farthest removed from traditional notions of security. Nearly all dimensions of security are challenged by the concept of *ecological security*. Whereas the state is seen as the central actor by traditional security scholars, most *ecological security* scholars, like many of their *environmental security* counterparts, feel that in order to achieve security for the environment, the state must not be the only actor involved. Rogers (1997: 30) claims that "ecological security allows scholars to think about security issues outside the state-centric rubric which has dominated IR for decades. Achieving ecological security encourages, and in fact requires, that multiple actors become involved in establishing goals for ecological security as well as offering a number of instruments for working towards these objectives."

Types of threats

The types of threats that each discourse emphasizes shifts as one progresses across Table 1. For traditional security scholarship, the major threat of concern is human death and destruction due to military action. This is essentially the same type of threat that the *environmental conflict* discourse emphasizes. This is one of the ways that *environmental conflict* is closely related to traditional security. Both of these categories have threats that are very direct and purposive. Another element of threat identified in the *environmental conflict* discourse is the threat of instability of the state that conflict over resources can bring.

Both *environmental security* and *ecological security* identify different types of threats that scholars should address in addition to military threats. These two categories are more concerned with non-purposive types of threats, or threats that include a lesser degree of intentionality. There are a variety of threats of concern for *environmental security* scholars-

including death due to disease and famine, displacement for environmental reasons, and death and destruction due to conflict, to name a few. According to Pirages, premature death of humans in any form constitutes a security concern and humans die in other ways besides military conflict.[19] The *environmental security* discourse attempts to address some of these other sources of premature deaths.

The *ecological security* discourse argues that the most important type of threat that requires immediate attention is the destruction, and often irreversible damage, to ecosystems. This reflects the ecocentric nature of the *ecological security* discourse, and once again points to the fact that *ecological security* is the furthest removed from traditional scholarship. This will become even more apparent in the following sections.

Sources of threats

A discussion of the sources of threats in each framework ties directly to the actors involved. For traditional security, the sources of threats are largely seen as other states. As was discussed with the example of terrorism, it is often difficult for those involved in traditional security scholarship to get away from the focus on the state as the source of security threats. Similarly, the source of threats in the *environmental conflict* discourse is also typically seen as state actors. However, many scholars who use an *environmental conflict* discourse view sub-state actors as the primary source of threats. Homer-Dixon (1994) explains that environmental conflict will often occur at the sub-national level. If this is the case, then the source of the threat will be sub-state actors. This levels-of-analysis problem is one of the most heavily

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[19] Personal communication with Dennis Pirages, 3/14/05.

criticized aspects of the *environmental conflict* discourse. Critics argue that while many scholars

who use an *environmental conflict* discourse expect to see conflict at sub-state levels, they

often target their analysis at the level of the national state (Gleditsch 1998).

Environmental security looks less like traditional security with regard to identifying

sources of threats. Because the *environmental security* discourse is so broad, the sources of

threats include numerous entities. Threats can come from state actors, they can come from

groups engaging in behavior that is environmentally unsustainable, and they can even come

from natural processes within the environment itself. This large number of threat sources is in

stark contrast to *ecological security* in which the actions of human beings is identified as being

the main source of threat that one should be concerned with. This difference of the location of

threats will become clearer through an examination of the cases in later chapters.

Who or what is vulnerable?

A discussion of who or what is vulnerable serves to highlight the anthropocentric nature

of traditional security scholarship, the *environmental conflict* discourse, and the *environmental

security* discourse. Traditional security views those who are vulnerable as being the state that is

threatened, and the citizens of that state. This is logical due to the focus on the state as the

main actor involved in security concerns. Scholars who use an *environmental conflict* discourse,

on the other hand, often claim that the site of environmental conflict will be at the sub-state

level, and therefore sub-state populations are the most vulnerable to the threat of human

death and destruction due to this conflict. If environmental conflict breaks out at the state

level, then those who are most vulnerable are the citizens of the states involved. However,

most scholars who use an *environmental conflict* discourse have focused instead on the state itself as a vulnerable actor in the event of environmental conflict.

Since *environmental security* focuses on a wide variety of threats, and sources of threats, it follows that those who are vulnerable will encompass a large number of people. In general, those who are considered to be vulnerable to such threats include all human beings. This is somewhat different from the *environmental conflict* discourse because vulnerability stems from much more than strictly violence over resources. Both of these, again, are nearly the reverse of *ecological security* ideas. That which is vulnerable in the *ecological security* discourse is the environment as a whole, rather than the human population as a whole.

Degree of intentionality

The degree of intentionality involved in each of the three frameworks represents a stark difference from that typically involved in traditional security. Deudney (1990: 193) claims that there is typically a high degree of intentionality involved in traditional security. He points out that "[o]rganizations are mobilized, weapons procured, and wars waged with relatively definite aims in mind." Each of the other discourses could involve either a high or low degree of intentionality. In *environmental conflict*, if groups deliberately target others in order to gain a hold on scarce resources, then there is a high degree of intentionality involved. If, on the other hand, conflict erupts suddenly and indirectly, then intentionality would be low. However, the *environmental conflict* discourse typically involves a higher degree of intentionality than either of the others.

Environmental security and *ecological security* issues could both involve a range of intentionality. Many of the threats identified by *environmental security* scholars would involve a low degree of intentionality (spread of disease through migration, famine due to erosion, etc), however there could be instances where one's intent was actually harming human health. As far as *ecological insecurity*, using the environment as a military target would be an example of a high degree of intentionality. Human actions that are unknowingly damaging to the environment represent a low degree of intentionality.

The issue of intentionality is particularly important in the process of policymaking. Activities with a high degree of intentionality are typically easier to regulate than those with a low degree of intentionality. For example, if populations are systematically engaging in environmental conflict then steps can be taken to stop the behavior- albeit not easily. If, on the other hand, insecurity is stemming from human behavior like high consumption levels, this is unintentional and extremely difficult to regulate when framed as an *environmental security* issue.

Conclusions

I have identified three ways that scholars discuss a connection between security and the environment through discourse analysis of academic debates on this issue. It is important, however, to clarify how the three discourses relate to each other. It is not the case that each is a separate, distinct discourse with no overlap. On the contrary, the discourses have a high degree of interplay with one another. The *environmental conflict* discourse represents one

aspect of the interactions between humans and the environment, with a large focus on the state. The *environmental security* discourse represents multiple aspects of the interactions between humans and the environment, including the potential for conflict. The overlap between these two discourses in particular is seen by the fact that several of the storylines in each discourse relate to one another. For example, increased population is focused on within each discourse. The difference between the two manifests in the way that population is treated in each discourse. The *environmental conflict* discourse relates population growth to things like resource scarcity and ultimately violent conflict. On the other hand, the environmental security discourse views population increases in much broader terms, relating population growth to human security concerns. The implication of this broader focus is that there are many types of social units that have a role to play- including the state and individuals. Finally, the *ecological security* discourse focuses on the implications of human-environment interactions for ecosystems rather than for particular social units. Figure 1 is a visual representation of the overlap between these discourses.
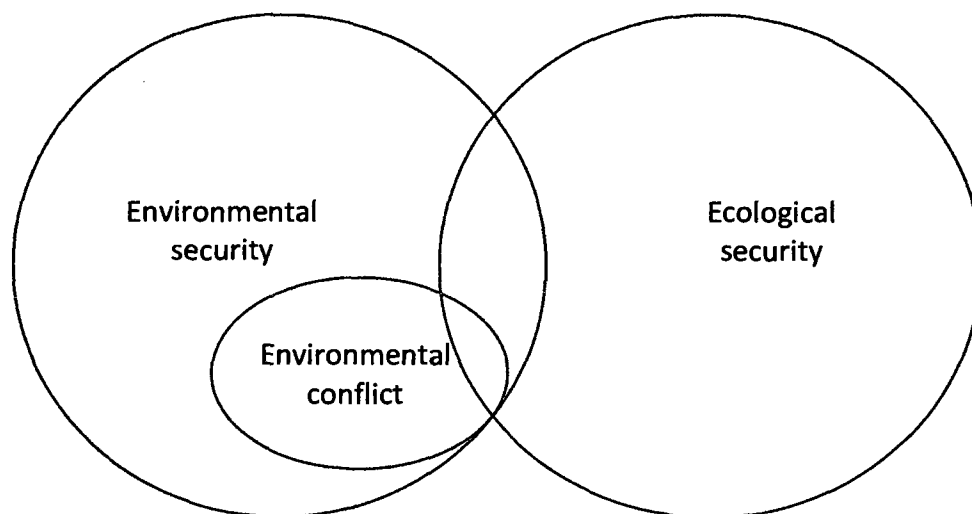

Figure 1. Diagram of the three security and environment discourses.

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After comparing the security and environment discourses to traditional ideas of security, it becomes clear that while each of the discourses represents an alternative to the dominant security paradigm, the *environmental security* discourse and the *ecological security* discourse are even farther removed from traditional notions of security than is the *environmental conflict* discourse. This is likely to have serious policy implications for each of the discourses. If *environmental conflict* is portrayed as an *extension* of traditional security rather than a *challenge* to it, then it will likely be easier to incorporate issues like resource scarcity into the dominant security discourse. Much more so than the other two discourses, there has been some movement in this direction in the past few years. Internationally recognized political figures as well as international organizations have incorporated some of the tenets of *environmental conflict* into their speeches and papers.

Because the *environmental security* discourse contests some of the fundamental aspects of traditional security scholarship, it has been slower to be accepted by the academic security community. In some ways it appears that the *environmental security* discourse is being marginalized by the still-dominant traditional security ideas. On the other hand, it could be seen as a discourse that has not been strictly tied to mainstream security ideas, which can offer space for the inclusion of alternative concerns- including gender. In any case, tenets of *environmental security* have been influential in policymaking circles. For example, the issue of climate change was discussed at the UN Security Council in 2007. Despite the venue being associated with traditional security concerns, most of the climate change debate took place within an *environmental security* discourse (Detraz and Betsill 2009).

Because of its ecocentric nature and critiques of traditional security scholarship, the *ecological security* discourse is least likely to become a major challenger to dominant security discourses. Moreover, because policymakers are ultimately accountable to humans and not ecosystems, the *ecological security* discourse is difficult to incorporate strongly into policymaking.

The practice of linking security and the environment is a relatively new undertaking, and the discourses on security and the environment reflect the variation possible within this field.[20] It is still not immediately clear what the future holds for these discourses, although an evolution in their foci is likely. This is important, because the use of one discourse over another has significant implications for shaping the terms of debate, and for policymaking. If something like climate change is discussed with an *environmental conflict* discourse, certain policy options look the most promising- namely those that avoid conflict over resources and ensure the stability of the state. On the other hand, if climate change is thought of as an *ecological security* issue, policies would be geared toward ensuring the security of the environment from harmful human behaviors, including some behaviors of states. Another implication of using one discourse over another is the range of issues considered central to the debate. The next chapter explores gender within each of these discourses, a topic that is currently missing from each. As will be seen, some security and environment discourses have more conceptual space for the inclusion of gender concerns than others.

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[20] Dabelko (2008: 39) argues that the diversity of security and environment discussions is beneficial. "The failure of one set of environment and security linkages to achieve dominance has guaranteed that no avenues have been prematurely closed off. The temptation to crown one set of linkages the top priority or the only legitimate definition of environmental security ignores the diversity of valid concerns that arise in different contexts and sets up a false all-or-nothing choice."

Chapter 3- Gender and the Debate On Security and the Environment

Our miseries are ineluctably the product of our natures. The root of all evil is man, and thus he is himself the root of the specific evil, war. This estimate of cause, widespread and firmly held by many as an article of faith, has been immensely influential (Kenneth Waltz 1959: 3).

There is another response to the growing ecological crisis which comes from women engaged in the struggle for survival: because of their location on the fringes, and their role in producing sustenance, women from Third World societies are often able to offer ecological insights that are deeper and richer than the technocratic recipes of international experts or the responses of men in their own societies (Vandana Shiva 1994: 1).

As chapter 2 suggests, there is great variation among those who propose a link between security and the environment. However, none of the previous discourses includes gender as a central focus. This is an important omission because gender concerns are not informing the debates on security and environment links, and the discourses that are emerging from these debates. This is significant at a theoretical level, as this chapter addresses, as well as at a practical level for policymaking. The latter area will be discussed through the next three case chapters. This chapter addresses the necessary inclusion of gender into the security and environment discourses. This is an opportunity to explore the ways in which incorporating gender complements the security and environment discussions as well as the ways in which those discussions would have to be altered in order for gender to become a fundamental aspect of analysis. The current debate exhibits gendered understandings of both security and the environment, and these gendered assumptions and understandings benefit particular people and are often detrimental to others. Examining security and environment discourses through a gender lens gives insight into the gendered nature of international environmental

politics and provides crucial redefinitions of the concept that are more useful, both empirically and analytically.

It is important to emphasize this research explores gendered understandings of environmental security rather than simply the roles and responses of women in the environmental security debate. Gender can be defined as a set of socially constructed, ideal type ideas about what men and women ought to be. Bretherton (1998: 85-86) explains that "[s]ocial gender analysis involves examination of gender-based divisions of labour and differential control of/access to resources, together with their intersections with class and ethnicity, in a given socio-cultural context." She claims that this is different than an approach seeking to bring women into an analysis, which can isolate women from the broader socio-cultural context in which behavioral norms are embedded. Therefore, this chapter will not only explore the particular position of women within the context of security and environment, but also investigate the objects of study and the specific language used in the present discussions for examples of gendered implications. In order to explore gender in the security and environment debate, I first examine gender within current discourses on security and environment. In this section I introduce gender-based "tools" from feminist scholarship that are integral to a critique of the current state of the field. Next, I argue that there is an uneasy overlap between security and environment discourses and gender-based insights in international relations. I contend that, instead of the lack of communication that is a persistent feature of these approaches currently, feminists and security and environment scholars would benefit from a dialogue. The chapter concludes by highlighting what a gender focus offers the security and environment debate.

Feminist Literatures

In my analysis of gender issues in the ties between the environment and security, I consult various feminist perspectives on the relationship between gender and security as well as gender and the environment. To do this, I use a critical approach to the debate. In terms of critical theory, I have in mind an approach that examines how boundaries are defined and attempts to change those boundaries to the benefit of those who experience oppression. Devetak (2001: 155) explains that "while the removal of various forms of domination and the promotion of global freedom, justice and equality are the driving forces behind critical international theory, these are articulated on the basis of reflexive theory based on the method of immanent critique." This is a natural fit with the goal of examining gender components of security and the environment as a means of both exposing whether gendered concerns are excluded from the debates, as well as exposing the unequal negative impacts of environmental change.

Feminisms and security

As with most approaches, there is significant variety among feminists in international relations.[21] Wibben (2004: 106) argues that "while there are many feminisms, some say as many as there are feminists, they agree on a common goal- to make the world a better place for women. So, while they might not agree on how this should be done nor on what exactly the

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[21] For an overview of feminist perspectives in international relations, see Sjoberg and Tickner (2006). These authors discuss various strains of feminism in international relations, including liberal feminism, critical feminism, feminist constructivism, feminist poststructuralism, and postcolonial feminism.

label 'woman' encompasses, they want to dismantle current hierarchies and reduce gender inequalities." Scholars interested in making the world a better place for women start their analyses by looking for gender oppression in the world. They analyze global politics *in terms of* the gender relations present within. This means that while the feminist perspectives that can inform the discourse on security and the environment will have important differences, there will be an underlying link among them.

Likewise, there is variation among those scholars who use feminist approaches to study security. Several feminist scholars highlight the specific associations between gender and war or conflict (Afshar and Eade 2004; Elshtain 1987; Enloe 2000; Tickner 2001; Vickers 1993). Like critical security theorists in general, these feminist authors often claim that "security must be analyzed in terms of how contemporary insecurities are being created and by a sensitivity to the way in which people are responding to insecurities by reworking their understanding of how their own predicament fits into broader structures of violence and oppression" (Tickner 2001: 47). Additionally, these scholars specifically seek to understand the unique security situations of women and men. In particular, feminist security studies examine all of the different ways that war or conflict impacts women. Rather than assume that conflict or war impacts everyone similarly, or even that it impacts the oppressed in the same ways, feminist security scholars conclude that all stages of conflict are gendered- and that this often serves to make women more vulnerable than men to security threats. Again, these authors typically have

an emancipatory agenda in mind when calling for a revision of security definitions- though not

all will agree on how this emancipation should come about.[22]

Feminist security studies concentrate on the ways that world politics can contribute to

the insecurity of individuals, especially individuals who are marginalized and disempowered

(Tickner 2001). This is in contrast to traditional security approaches in international relations

that have typically evaluated security issues either from a structural perspective or at the level

of the state and its decision makers.[23] There is a tendency in this literature to look at what

happens during wars as well as being concerned with their causes and endings. "Rather than

seeing military capability as an assurance against outside threats to the state, militaries are

seen as frequently antithetical to individual security, particularly to the security of women and

other vulnerable groups" (Tickner 2001: 4). As these statements demonstrate, feminist security

studies give a great deal of attention to the individual level, an example of the ontological and

methodological differences that sets them apart from traditional international relations security

studies.[24] Tickner (2001: 48) explains that "Feminists seek to understand how the security of

individuals and groups is compromised by violence, both physical and structural, at all levels."

At the same time, however, many authors caution against simplistic analysis that

automatically views women as victims in times of war (D'Amico and Weinstein 1999; Sjoberg

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[22] Booth defines emancipation as "the freeing of people (as individuals and groups) from the physical and human constraints which stop them carrying out what they would freely choose to do. War and the threat of war is one of those constraints, together with poverty, poor education, political oppression and so on. Security and emancipation are two sides of the same coin. Emancipation, not power or order, produces true security. Emancipation, theoretically, is security" quoted in Smith (2005: 42-43).

[23] Peterson (1992: 31) argues that "a global crisis of security exists and...our pursuit of world security is impeded by the privileging of state sovereignty and the configuration of authority and political identity it constitutes." This is an example of a feminist perspective that challenges the state-centric nature of some other approaches to international relations.

[24] Tickner (2004) claims that methods employed by feminist security scholars such as ethnography and discourse analysis are not typically used in conventional security studies, however they are typical of feminist approaches more generally.

and Gentry 2007). They call for a more nuanced understanding of the particular experiences of women during times of conflict. This caution is echoed by many feminists who argue against essentialist and reductive notions of peaceful women and aggressive men.[25] Many believe that the unproblematic connection of women with an idealized and passive definition of peace has worked to devalue both women and peace (Tickner 2004a). A project that unquestioningly asserts an association between women, peace, and idealism may actually serve to disempower women by keeping them out of the "real world" of IR security studies (Tickner 1999). Still, many feminists who engage in security studies do focus on particular issues and abuses that women often face during war or conflict. These include rape in war (Enloe 2000; Hansen 2001), military prostitution (Enloe 1989; Moon 1997), refugees (many of whom are women and children) (De Jong 2000; Enloe 1990; Indra 1999), and more generally issues about civilian casualties (Tickner 1999).

Table 2. Comparing traditional security to gender and security ideas.

	Actors Involved	Threats	Source of Threats	Who or What is Vulnerable	Degree of Intentionality
Traditional Security	-Mainly the state	-Human death and destruction due to military action	-State actors -Occasionally non-state actors	-State being threatened and its citizens	-High
Gender and Security	-The state -Sub-state actors -Supra-state actors	-Processes or phenomena that threaten the health and well-being of individuals	-Societal structures -Human behaviors -Natural processes	-Individuals, particularly those who are marginalized in society	-High or low

[25] Elshtain (1987: 4) uses Hegel's imagery of "Just Warriors" and "Beautiful Souls" to describe the gender-specific virtues that are often assigned to men and women respectively. "Man construed as violent, whether eagerly and inevitably or reluctantly and tragically; woman as nonviolent, offering succor and compassion: these tropes on the social identities of men and women, past and present, do not denote what men and women really are in time of war, but function instead to re-create and secure women's location as noncombatants and men's as warriors. These paradigmatic linkages dangerously overshadow other voices, other stories..."

Table 2 shows how gender and security ideas compare to traditional security scholarship. The main points of departure are the comparatively narrow focus of the traditional security scholarship versus the broader focus of gender and security ideas, and the particular attention to the security situation of those who are marginalized in society, especially women.

Gender and the environment

In the way that feminist security studies expose the particular instances of gendered assumptions and impacts of security for women, other scholars point out the connections between gender, women and the environment. Examples of these links span back to the UN Decade for Women (1975-1985) and various conferences, particularly the Nairobi Women's Conference in 1985 and the Fourth World Conference on Women in Beijing in 1995.[26] It was at this time that a recognition was made that issues like access to fresh water and land were essential for the empowerment of women (Galey 1986; Hendessi 1986). According to the Beijing Declaration, "eradication of poverty based on sustained economic growth, social development, environmental protection and social justice requires the involvement of women in economic and social development, equal opportunities and the full and equal participation of women and men as agents and beneficiaries of people-centered sustainable development" (United Nations 1995). This shows the recognition that women are an essential element to sustainable environmental solutions, often because of their relationship to the environment in their daily lives.

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[26] For more about the Nairobi Women's Conference, see Staudt and Glickman (1989), Hendessi (1986), and Galey (1986).

While it is difficult to generalize about the experiences of women with regard to experiences with environmental change, there are some trends that are worth mentioning. Buckingham-Hatfield (2000) explains that the typical household tasks that women perform are remarkably similar across cultures, although the households themselves and the tools used to perform the tasks will vary greatly. These include tasks like caring for children and older relatives, and maintaining the family home. These similarities lead women to generally experience environmental change differently from men, often because of this role as caregiver. Being responsible for the well-being of family members means that it is often women who are most aware of environmental ills that negatively impact health. Also, women are often left out of decision-making positions that could address these issues.

Bretherton (2003) argues that women must be a fundamental part of managing the environment. She presents four sets of arguments as to why this is beneficial- efficiency arguments, equity arguments, ecofeminist arguments and emancipatory arguments. Efficiency arguments say that women's relationship to the environment puts them in a prime position to implement environmental management schemes. Equity arguments claim that women have the right to be involved in the same way that other groups are. Both ecofeminist arguments and emancipatory arguments challenge the driving masculine norms that currently govern environmental protection and management. Each of the arguments regards women as necessary elements in successful environmental management- albeit with differing amounts of agency for women.

In particular, ecofeminism represents a widely discussed combination of gender issues and the environment. Warren (1997: 3) describes ecofeminism thusly

> According to ecological feminists ('ecofeminists'), important connections exist between the treatment of women, people of color, and the underclass on one hand and the treatment of nonhuman nature on the other...Establishing the nature of these connections, particularly what I call women-nature connections, and determining which are potentially liberating for both women and nonhuman nature is a major project of ecofeminist philosophy.

Ruether (1997) identifies two main lines of thought among ecofeminists. One line of thought sees a women-nature connection as a social ideology constructed by patriarchal culture in order to justify the ownership and domination of both women and the natural world. She claims that these ecofeminists "see the separation of women from men by patterns of cultural dualism of mind-body, dominant-subordinate, thinking-feeling, and the identification of the lower half of these dualisms with both women and nature, as a victimology" (Ruether 1997: 76). These dichotomies mask who women, men, and nature really are in their wholeness and complexity. A second line of thought agrees that the patriarchal women-nature connection serves to justify the domination and abuse of both, but also believes that there exists some deep positive connection between women and nature. This approach could also view humans as embedded in ecosystems, but would reserve a particularly positive role for women in this view.

I find this second version of ecofeminism overly essentialist and will primarily draw on the first identified strain of thought. The charge that ecofeminism can be essentialist is levied by both critics of ecofeminism and ecofeminists. Sturgeon (1999) argues that in the academic sphere, essentialist rhetoric can lead to poor scholarship as well as ignore important differences between groups of women.[27] The alternative version of ecofeminism, that which explores the

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[27] Sturgeon (1999: 256) does acknowledge a difference between the academic and the activist spheres. She claims that in the activist realm "making claims, even essentialist ones, about the existence of such collectivities as

links between the domination of women and the domination of nature, often points to the linguistic interconnections between women and non-human nature. Warren (2000: 27) claims that "Euro-American language is riddled with examples of 'sexist-naturist language', that is, language that depicts women, animals, and nonhuman nature as inferior to (having less status, value, or prestige than) men and male-identified culture." She points to the many instances that women are described in pejorative animal terms, and links this to animalizing women within a patriarchal culture where animals are seen as inferior to humans.[28] This thereby reinforces and authorizes women's inferior status. The reverse of this trend is also commonly found within Euro-American language (i.e., nature characterized in feminine terms serving to reinforce nature's inferior status). Each of these linguistic associations can be made because of the patriarchal nature of society, where that which is associated with male-ness is valued more highly than that which is associated with female-ness.

Along these same times, the literature that explores the connection between women and development, particularly those that incorporate the concept of "sustainable development" is also relevant to a project of this kind. As with many concepts that are as widely used as sustainable development, there are many notions about what the term actually means. Harcourt explains that those concerned with women's typical situation of being on the fringes of development are not satisfied with the traditional conceptualization of the term. Harcourt (1994: 2) claims that

'women' has contributed to the creation of political movements oriented toward protecting the environment, as well as other movements. These movements intervene effectively in on-going contests over power, influence, resource exploitation, and labor processes."

[28] This is not to say that only females are denigrated by the use of animal language, or that the use of animal or nature language is always derogatory. However, within patriarchal contexts, "the vast majority of animal terms used to denigrate women, and the vast majority of female terms used to describe animals and nature, function differently from those animal terms used to denigrate men" (Warren 2000: 28).

> Feminists involved in the ecological and women's movements are concerned that the complex social, cultural, economic and political relations, which inform women's lives and gender inequalities, are not being addressed by the mainstream debate. In this, they welcome the current interest in sustainable development as an opportunity to further feminist methodology, thinking and practice, and also as a political space where women can negotiate for better conditions which respect their choices and meet their different cultural and economic needs.

Shiva (1997) challenges a patriarchal "maldevelopment" in which human society marginalizes the aspects of the feminine principle in nature and society, and instead calls for women's needs and experiences to be taken seriously.

Since different paths to development in the developing world often have survival implications for its population, a gender-sensitive approach to sustainable development that takes into account the needs of women, the ecosystem, and future generations within a particular setting appear necessary to ensure security. One issue that an approach of this kind addresses is that of population growth and development, an issue that has attracted the attention of many feminist scholars due to its direct impacts on the choices of women.[29] Sen (2004) explains that feminists criticize population limitation development strategies that otherwise ignore or exploit poor women, yet make them the main target of population programs. They feel that population control should not be made a substitute for directly addressing the poor economic situation that many of the world's women face. Rather, population policies should be critically assessed in order to expose why they are introduced, and who benefits from them.[30] Some feminist scholars also highlight the unequal negative

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[29] The fact that population is a storyline in both the *environmental conflict* and *environmental security* discourses is discussed in the next section.

[30] Questions like this raise the point that in some cases the health of women may benefit from family planning measures or other population related policies, however an uncritical link between women's health and

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ramifications that population-reduction policies have on women and girls, including high levels

of female child abandonment or abortion (Dalsimer and Nisonoff 1997; Hudson and Den Boer

2005). Issues like these reveal the significant policy implications wrapped up in security and the

environment discourses. These decision-making impacts are a practical reason that gender

must be addressed in these areas. This shows that whether or not gender concerns are

incorporated into security and environment discourses is not merely a theoretical exercise, but

rather has policy implications which affect people's lives.

Gender in Security and Environment Discourses

This section will outline some of the intersections between the discourses on security

and the environment and gender. To begin with, recall that the debate over security and the

environment emerged largely in the period after the Cold War when additional topics were

being tied to security. This represents one in a long line of attempts by scholars to define

security for particular means. This begs the question, where does gender analysis fit in this

struggle? The feminist security scholars discussed in this chapter represent an attempt to alter

the security discourse in a way that takes into consideration individual level insecurities and

challenges the gendered assumptions of traditional security conceptualizations. The post-Cold

War alternative notions of security have still been fairly narrow, a trait of security alternatives

that has continued into the post-9/11 world. They lack a serious attempt to incorporate issues

that feminists are concerned with. The state of the debate on the links between security and

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*population control, or population reduction and development masks the potential problems that these policies
raise for women.*

the environment is that elements like gender concerns and the particular security situation of women are still marginalized in the discussions.

I also think that it is important to note at the outset that some feminists will object to the idea of joining the concepts of security and the environment outright. Like many nonfeminist authors who criticize this connection for its potential to militarize the environment and further expand the realm of issues that are seen as the purview of the state (Conca 1994; Levy 1995; Gleditsch 1998), some feminists will view the particular insecurities that militarization bring for women as reason enough to steer clear of the concept. However, I feel that presenting a counter-discourse to traditional security studies can be performed in such a way that highlights the gendered assumptions of mainstream perceptions and calls attention to the specific issues that both men and women face in the current era of environmental politics. In the next section, I will examine each of the security and environment discourses in turn and discuss the potential critiques and contributions that gender analysis can make to each. Gender analysis involves examining gender during the course of discourse analysis in order to understand the place of gender in the security and environment discourses. This reveals the spaces available for the inclusion of gender, as well as the elements of the discourses that are incompatible with the inclusion of gender.

Environmental conflict

Chapter 2 showed that the *environmental conflict* discourse largely fits within the traditional security paradigm that so many feminist international relations scholars find problematic. It is more of an attempt to add elements to traditional security instead of a necessary challenge to it. Additionally, in many instances gendered language is used to discuss

and describe conflict. For example, while pointing out that environmental factors are rarely the sole cause of conflict, McNeil and Manwaring (2002: 8) claim "wars, after all, have many fathers." This may appear to be a trivial comment; however it reveals the underlying tendency in traditional security studies to associate war with masculinity and peace with femininity. It echoes the sentiment evoked by Waltz's 1959 title *Man, the State and War* which made such an imprint on international relations in general and post-World War II security studies in particular. Waltz (1959: 3) claims "[o]ur miseries are ineluctably the product of our natures. The root of all evil is man, and thus he is himself the root of the specific evil, war. This estimate of cause, widespread and firmly held by many as an article of faith, has been immensely influential." This represents an example of the gendered language present in this piece- namely associating "human nature" with men, and men with war. Through the use of feminist tools, such as the concept of gender-sensitive lenses, we understand the importance of this gendering. "[G]ender-sensitive lenses enables us to see the extent and structure of gender hierarchy by examining both how social constructions of masculinity and femininity shape our ways of thinking and knowing and how women's and men's lives are patterned differently as a consequence of gendered practices" (Peterson and Runyan 1999: 257). The fact that masculinity is associated with war means that women can easily become forgotten when discussing war and conflict. This makes them virtually invisible in the discourse and makes their unique experiences hidden from view.

Because of this tendency toward essentialization, reflexive scholarship is a necessity. Attention must be paid to generalizations made about the experiences of any group of individuals, however we must acknowledge that people do experience conflict differently.

Scholars like Carpenter (2005: 296) caution that using "gender essentialisms" to advocate for the protection of vulnerable groups like women, children, and the elderly during times of war "has obscured the gender-based vulnerabilities that draft-age civilian males face in armed conflict, including risks of forced recruitment, arbitrary detention, and summary execution." What this position masks is the socially constructed gender roles of each of these groups. In response to Carpenter, Sjoberg (2006: 891-892) contends that "the effect is only the neglect of civilian men if women are being protected and civilian men otherwise would be...Instead, the evidence demonstrates that [the use of 'women and children' as a proxy for 'civilians'] stereotypes women as helpless and perpetuates the gender-subordinating effects of war-fighting." She argues that gender essentialism has appeared for millennia in just war theories, and that this is tied to "gender subordination perpetrated by the gendered just war tradition." If as scholars we truly want to have policy relevance for particular problems, we need to be mindful of the particular insecurities that individuals, both women and men, face in times of conflict- along with an understanding that war disproportionately victimizes women (Cockburn and Zarkov 2002; Mertus 2000; Vickers 1993).

Some of the elements of the *environmental conflict* discourse that are difficult to reconcile with gender analysis are the narrow definition of security, the level of analysis most often used, the focus on scarcity, and the lack of gender analysis in the suggested causes of resource conflicts. The *environmental conflict* discourse focuses on the potential for environmental degradation and scarcity to cause violent conflict, something that coincides with the traditional security studies tendency to examine the causes and outcomes of war or conflict rather than looking at what happens during wars. Including gender means including the

assessment of potential insecurities during wartime as well, given that women often face particular security risks during times of conflict. To term something a security study and then to leave important elements of insecurity untouched is problematic.

A second problematic element of the *environmental conflict* discourse is the level of analysis most typically used. Feminists often engage in a multilevel analysis, with particular attention paid to individuals and groups within societies. The *environmental conflict* discourse is typically used by scholars who restrict their attention to the level of the state, again demonstrating the close links between this approach and traditional security studies.[31] For example, although Homer-Dixon (1994) claims that it will more likely be sub-state groups who will engage in conflict over resources, he still directs his assessment of possible outcomes and solutions to the state. By paying attention to security at levels both above and below the level of the state, a richer understanding of the condition of security can more easily be reached. Additionally, to simply focus on the state is problematic due to the unequal level of participation of women in most state governments, again forcing women to the fringes of analysis.

Ecofeminists will take issue with the assertion of a link between resource conflict and scarcity. Many scholars, both feminists and non-feminists alike, criticize the focus on scarcity in *environmental conflict* research. Peluso and Watts (2003: 94) claim that "the emphasis on so-called scarce resources occludes the real sources of such problems/conflicts, and in so doing makes them more difficult to resolve." Treatments of scarcity in this literature are largely

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[31] A notable exception to this trend is *Greenwar: Environment and Conflict*, edited by Olivia Bennett (1991: 3) that argues from an *environmental conflict* position. This book is a collection of "voices and opinions of women and men whose countries and lives are directly affected by the deteriorating situation in the Sahel" of Africa. However, while there is a good deal of attention paid to individual experiences of inhabitants of the Sahel, including personal quotes, etc., there is still a focus on state-level conflicts.

anthropocentric, suggesting that the environment is made up of resources for human consumption. This goes against the ecofeminist notion that the environment is made up of human and non-human connections. Authors like Merchant (1996) call for the acknowledgement of a dynamic relationship between human and non-human nature, with each having a degree of power over the other. To use terms like scarcity implies that the environment is something of a stockroom of resources for humans that may become depleted, which disregards the deeper relationship between the two entities.

Recall that the storylines discussed as potentially contributing to resource scarcity and conflict in the *environmental conflict* discourse include population growth, human migration, globalization, and unequal resource distribution. Each of these storylines has particular implications for gender analysis that are largely unaddressed within this literature. Population growth in particular is a topic within which a lack of discussion of women's issues is a huge oversight. Those who use an *environmental conflict* discourse often argue that increases in human populations can directly contribute to both supply-induced and demand-induced scarcities (Homer-Dixon 1999). If these scarcities are combined with other destabilizing factors, it is argued that the result could be violent conflict. By identifying population increase as a contributor to resource conflict, these authors are automatically making women the potential target of policy "solutions" because of their role as child bearers. This is particularly problematic when the issue of gender is completely ignored in many articles dominated by the *environmental conflict* discourse that address population specifically. For example, in a special issue of the *Journal of Peace Research* on resource conflict Tir and Diehl (1998) write about

population growth and density and its impacts on militarized disputes and war. There is no analysis of gender in the article and its role in these population issues.

Many scholars criticize population limitation development strategies that otherwise ignore or exploit poor women, yet make them the main target of population programs (Sen 2004). They feel that population control should not be made a substitute for directly addressing the poor economic situation that many of the world's women face. Rather, population policies should be critically assessed in order to expose why they are introduced, and who benefits from them. Questions like this raise the point that in some cases the health of women may benefit from family planning measures or other population related policies, however an uncritical link between women's health and population control, or population reduction and development masks the potential problems that these policies raise for women. Some feminist scholars also highlight the unequal negative ramifications that population-reduction policies have on women and girls, including high levels of female child abandonment or abortion (Dalsimer and Nisonoff 1997; Hudson and den Boer 2005). Although those who use an *environmental conflict* discourse do not necessarily advocate specific population reduction measures, the fact that they identify population growth as contributing to the likelihood of resource conflict means that they need to be mindful of the ramifications of such measures. When issues are securitized, certain actions are seen as justifiable- and it is probable that men and women will experience these actions differently (Hansen 2004).

In addition, the issues of human migration, globalization, and unequal resource distribution also can have unequal gender impacts. Those who use an *environmental conflict* discourse claim that each of these can potentially contribute to environmental degradation,

resource scarcity, and therefore violent conflict over resources. As the resources of an area become depleted, the population of that area may be forced to migrate to an area with better environmental health (Homer-Dixon 1994). What this assertion misses is the fact that men and women often face different challenges as migrants or refugees (Enloe 1990; DeJong 2000; Indra 1999; Kofman 2004). Kofman (2004: 657) explains that women's international migrations are often shaped by their migration through family routes and power relationships in the household. "Immigration regulations may place women in a position of dependency, but their trajectories and strategies are also influenced by power relations within the household, in both countries of origin and destination." In the particular case of environmental displacement in Sudan, women face unique challenges in their new lives- including being at risk for violence by male members of the household, and being at risk for social harassment and rape outside their homes as traditional forms of the marriage institution dissolve (Babiker Mahmoud 1999).

Globalization itself is not gender neutral. It is largely characterized by a majority of men in top-level global activities and has cultural properties and power dynamics that have historically been associated with powerful men (Tickner 2004). Additionally, as globalization spreads capitalism and high consumption patterns which can negatively impact the environment, it also spreads the idea of commodification and domination of nature, which ecofeminists associate with male domination over females. And finally, unequal resource distribution is relevant to consider in terms of North/South, urban/rural, or elite/masses differences, but also male/female differences. The latter is not taken up by the *environmental conflict* discourse. Each of these instances of male/female differential impacts has implications

for the security of particular individuals, if security is conceptualized broadly (Beneria 2003; Rai 2002).

In sum, the *environmental conflict* discourse is one in which major changes are necessary if gender is to become a fundamental part of the discourse. Issues like the narrow definition of security, the level of analysis most often used, the focus on scarcity, and the lack of gender analysis in the suggested causes of resource conflict represent elements of a feminist critique and reformulation of the *environmental conflict* discourse.

Environmental security

The *environmental security* discourse is much more closely in line with those feminist security studies that call for a redefinition of security rather than additions to security studies. As can be seen from the previous chapter, the *environmental security* discourse in general includes a much broader definition of security, which would allow for the examination of particular insecurities of individuals and groups in societies rather than being concerned about security from the perspective of states. Westing (1999: 282) argues that in order to achieve elements of environmental security, "they must go hand in hand with the safeguarding of ecosystems and biodiversity, the maintenance of a corruption-free government and a race-blind and gender-blind society, as well as the establishment of national and local democratic institutions and a robust legal system." This suggests that addressing inequalities in society is a necessary first step to providing security. Though this discourse is more compatible with the inclusion of gender, there are elements that need to be more clearly addressed through a gender lens. These include the relationship between humans and the environment, unequal

gender impacts of population pressure and globalization, and the degree of institutional change sought.

The primary storyline in the *environmental security* discourse is a concern about negative environmental impacts on human health and security. A caution for ecofeminists would be the potential to de-link humans and the non-human environment in this approach. Merchant (1996: xix) recognizes that humans have a degree of control over nature through human behaviors; however nature also has the power to destroy and evolve with or without humans in many cases. She therefore calls for "an earthcare ethic, which is premised on this dynamic relationship, [and] is generated by humans, but is enacted by listening to, hearing, and responding to the voice of nature."

Like the *environmental conflict* discourse, the *environmental security* discourse typically identifies particular elements of society that can contribute to both environmental degradation and human insecurity. These include accelerating globalization, increases in population, and the spread of disease.[32] Unlike in the *environmental conflict* discourse though, there is a tendency within the *environmental security* discourse to give some attention to the unequal gender impacts that these factors have, or at the very least treat them as more problematic variables. In terms of increases in population growth, Dalby (2002a) suggests that scholars look at the specific context of population increases, such as increases in urban populations, rather than make general statements about population pressure and environmental damage. Similarly, Barnett (2001: 59) claims that "to focus on the conflict potential inherent in population growth

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[32] Again, although accelerating globalization and population pressures are storylines in both the *environmental conflict* and *environmental security* discourses, they relate to different primary storylines. In the *environmental conflict* discourse, the primary storyline is the potential for violent conflict over natural resources, and in the *environmental security* discourse, the primary storyline is the negative impacts of environmental change for human security. The similar secondary storylines, therefore, will be cast in a different light.

is to ignore the real causes of poverty and vulnerability, namely the economic disadvantages people in the industrializing world experience from their exposure to global capital." This shows that this perspective is more critical than the *environmental conflict* discourse, however the fact that population pressure is still not assessed through a gender analysis suggests that the approach has further to go toward gaining a fuller understanding of human security and environment.

Many scholars associate globalization with an increase in economic interdependence throughout the world, and the spread of global capitalism in particular (Page 2002). Barnett (2001) offers an assessment of the unbalanced impacts of globalization on different parts of the world, and claims that it has heightened the insecurity of groups of people whose environment has been damaged to the point where they can no longer predictably extract resources for survival; however he neglects to discuss unequal gender impacts of globalization. What is needed from feminist perspectives is an assessment of the types of gendered values and assumptions that are also being transmitted through the process of globalization. Just as the security of individuals may be lessened through increased environmental degradation due to higher worldwide consumption levels, security can also be lessened through being subjected to structures within societies that justify the domination of both non-human nature and women. In the past, patriarchal ideas about the "correct" behavior of women were transmitted to areas around the globe during an earlier stage of globalization- namely colonialism (Enloe 2000). Likewise, studies of globalization in the current era need to be mindful of exactly what is being spread globally and for whose benefit. For example, there is significant evidence that suggests

that it is often women who are hardest hit by the process of economic restructuring in

countries that feel pressure to engage in the current global economy (George 2002).

One storyline in the *environmental security* discourse that is sometimes tied to

accelerating globalization is the spread of disease.[33] Pirages (1996) in particular identifies four

global changes that could lead to the spread of disease: rapid population growth and

urbanization; changes in human behavior, including shifts in sexual activity, changes in drug

use, and decreases in living conditions; regional environmental changes, including the

transformation of existing environments; and technological innovations such as antibiotics that

can both slow the spread of disease and cause the creation of resistant bacterial strains. Each of

these factors has unique impacts on both men and women (Davis 1997; Petschesky 2003).

According to a statement by the World Health Organization (2008), health issues like spread of

disease should be examined through a gender lens. Their website says the following about their

approach:

> While gender affects the health of both men and women, the department
> places special emphasis on the health consequences of discrimination
> against women that exist in nearly every culture. Powerful barriers
> including poverty, unequal power relationships between men and women,
> and lack of education prevent millions of women around the world from
> having access to health care and from attaining- and maintaining- the best
> possible health.

This demonstrates a way that these gender differences in the issue of disease can be examined

in order for the whole picture on human health to be garnered.

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[33] The *environmental security* discourse is broad enough to include elements such as a concern about disease as a part of its conceptualization of 'the environment', as was mentioned in the previous chapter. This is particularly the case when the spread of disease is encouraged by interactions with new environments.

In terms of a concern for population growth and security, the literature that explores the connection between women and development, particularly those that incorporate the concept of "sustainable development" is another secondary storyline in the *environmental security* discourse. This storyline views sustainable development and sustainability as ways to achieve environmental and therefore human security (Barnett 2001; Pirages and DeGeest 2004). Those concerned with women's typical situation of being on the fringes of development are not satisfied with the traditional conceptualization of the term sustainable development (Harcourt 1994). Since different paths to development often have survival implications for its population, a gender-sensitive approach to sustainable development that takes into account the needs of women, the ecosystem, and future generations within a particular setting appear necessary to ensure security. This means that if sustainable development or sustainability are advocated as providing security, then the specific needs of women also need to be addressed within that framework.

One critique of sustainable development is that it allows change to come in the form of the current structures of society rather than calling for substantial change (Worster 1995). Some feminist scholars will echo this concern with regard to many of the elements of the *environmental security* discourse. Advocating for change through sustainable development does not require a challenge to either the dominant economic or political structures or discourses, both of which are identified as patriarchal by various feminists. Additionally, the storyline of environmental peacemaking, or high stakes environmental issues fostering cooperative relationships between states, put forth by Conca and Dabelko (2002) offers a potential solution to environmental insecurity in a form that does not significantly challenge

dominant systems. This is still working largely within the current system, and identifying the

state level as the key level for analysis. While I feel that the state is a necessary element of

analysis for addressing issues of security and the environment, I do not think that the

exploration can end at this level. Important aspects of the story can only be uncovered by

looking both above and below the state.

There are some global and local organizations that combine a concern with human

health and the environment to gender issues. One example is the M.S. Swaminathan Research

Foundation, which combines human health, food security, and gender concerns.[34] The

organization stresses all that can be gained by consulting women's knowledge in order to

ensure food security, particularly in India. Food security is one important element of

environmental security in that access to food is a necessity for human health and security. The

ability to achieve food security is directly tied to the health of the environment, thus

environmental change can be detrimental to food security. It is acknowledged that women play

a unique role in the production of food in many parts of the world, and thus have much to offer

those making policy in this issue area. This may be an example of the way that these sets of

(overlapping) concerns can be explored in the future. There appears to be an awareness within

NGOs of the connections between these areas, and perhaps scholars will be convinced of the

connections as well.

In sum, the *environmental security* discourse is more compatible with gender analysis

than is the *environmental conflict* discourse. Despite this, there are significant areas of the

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[34] The full title of the organization is the M.S. Swaminathan Research Foundation and Centre for Research on Sustainable Agriculture and Rural Development. The organization is located in Chennai, India. Their website is http://www.mssrf.org/.

environmental security discourse that many feminist would critique and reformulate. These

include the relationship between humans and the environment, unequal gender impacts of

population pressure and globalization, and the degree of institutional change sought by those

who use an *environmental security* discourse.

Ecological security

The *ecological security* discourse is the farthest removed from traditional security

studies. The central concern in this discourse the security of the environment, which includes

human beings, largely from the threats presented by human activities. In this respect, many

ecofeminists will be pleased with the acknowledgement of a close relationship between human

and non-human nature and the rejection of the idea that humans are justifiably dominant over

nature. From an *ecological security* viewpoint, elements of ecosystems are seen as parts of the

total environment rather than as "resources" available for human consumption. This rejection

of the idea of exploitation of resources mirrors ecofeminists rejection of the dominating

relationship that patriarchal structures in society set up between humans and nature.

According to Babiker Mahmoud (1999: 45-46)

> Both disciplines call for the abolition of all forms of oppression and wanton
> destruction. In the case of the science of the environment, the aim is the
> 'liberation' of nature from depletion and destruction; in the case of gender
> studies, the aim is liberation of almost half of humanity from all forms of
> inequality and oppression. This includes their right to a fair share in using,
> enjoying and conserving the natural environment itself. Because of this
> common interest in liberation, both are disciplines of the future. This is an
> important commonality, because both disciplines strive to reshape the
> present and bring about a better future.

The fact that the *ecological security* discourse does not address the differential impacts of environmental degradation for men and women, however, will be a concern that needs to be addressed if gender is to be incorporated into this discourse.

One area of overlap between many feminist scholars and the *ecological security* discourse is a tendency to highlight the destruction to the environment that has historically stemmed from the traditional conceptions of security. Rather than the traditional security studies scholars' propensity to examine the causes of war or conflict and stop at that, both feminist security scholarship and the *ecological security* discourse include a concern about the on-the-ground consequences of war. For centuries, military personnel have directly targeted the environment during combat, usually at an extremely high price to surrounding ecosystems. Likewise, women have been targeted by strategies of militarized rape for centuries (Enloe 2000; Littlewood 1997; Moon 1997). Additionally, since military service has traditionally involved men, women and children have often been the casualties of collateral damage or other forms of insecurities either during or after wars.[35] This instance of similarity demonstrates that while *ecological security* does not currently include a systematic gender analysis of the impact of war on men and women, there is some precedent for the undertaking.

Apart from the negative environmental impacts of conflict, the *ecological security* discourse includes a critique of the level of autonomy that military departments and cabinets have in countries around the world. This calls into question the dominant position that militaries and the concept of "national security" issues have in the current system. As demonstrated above, this can have negative effects on both women's security and the security

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[35] These other forms of insecurities from war include forced migration, loss of economic security, loss of food security, etc.

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of the environment. The notion of sovereignty and state sovereignty in particular is often

invoked by policy-makers in order to take unattractive policy options off the table, and security

is typically regarded as being wrapped up with state sovereignty. This can often serve to prop

up the dominant discourse of militarized states that typically is accompanied by valuing that

which is male over that which is female. State sovereignty becomes problematic with

discussions of *ecological security* because ecosystems and environmental problems do not

typically respect state boundaries. Additionally, many feminist perspectives call into question

the idea that states are responsible for the security of their citizens by regarding militarization

as potentially undermining the security of many individuals and many women explicitly. To

highlight the point that militarization can actually result in insecurity for a segment of the

population, authors like Enloe (2000) discuss the problematization of "the protection myth"

that is commonly employed to uphold the legitimacy of war and the impossibility of peace. This

myth assumes that the military is a force that provides security at the domestic level and

ignores the incidents of insecurity that women face at the hand of militarization. This

demonstrates another instance of overlap between the goals of the two perspectives.

One point where feminist scholarship and the *ecological security* discourse may differ is

with the question of science in the analysis of environmental issues.[36] There is a central role for

science in the *ecological security* discourse. Many scholars who use an *ecological security*

discourse draw on ideas from ecology in order to make their link between security and the

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[36] In particular, the fact that gender does not typically factor into ecology analysis is problematic for ecofeminists in particular (Tickner 1992).

natural environment.[37] This privileging of science will be questioned by feminists like Harding

(1993: 39) who wish to problematize the idea of the sacredness of science. She claims that

"[t]he project that science's sacredness makes taboo is the examination of science in just the

ways any other institution or set of social practices can be examined." She argues that it is not

that there is a fundamental problem with scientific objectivity, but instead that knowledge

which is purported to be objective is often the subjective knowledge of privileged voices.

Instead we must have a "strong objectivity," including the perspectives of the marginalized in

the methodological and substantive concept of science (Harding 1998; Sylvester 2002). Science

is often assumed to be correct and beyond questioning in today's society. Relying on an

institution that is both dominated by males and is a part of the patriarchal social structure of

society may be questioned by those that wish to call attention to its potential problems as well

as benefits. Additionally, authors like O'Brien (2006: 2) claim that the current tendency in

society to treat environmental concerns as issues of "science" rather than of human security

fails to engage society in creating the transformations necessary to achieve sustainability. She

claims that the framing of an issue shapes the types of questions that are asked, the research

that takes precedence, and the solutions and policies that are suggested. "To reframe

environmental change as an issue of human security involves asking some very relevant

questions about equity, justice, vulnerability, power relations, and in particular, questions

about whose security is actually threatened by environmental change."

In sum, *ecological security* is the discourse that is the furthest removed from traditional

security studies. This position makes it likely that areas of overlap can exist between the

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[37] Many aspects of ecology are contested among scientists and scholars, so one must be cautious when speaking about ecology as a holistic entity (Barnett 2001).

approach and various feminisms. The issue that represents the most likely area of departure between the two is with *ecological security's* lack of gender analysis in its assessment of environmental change and security. The ecocentric nature of the *ecological security* discourse may make the incorporation of gender concerns difficult, however, because the discourse is largely concerned with the security of the environment itself rather than specifically for groups of people.

How Does Gender Fit Into the Debate?

The above discussion has demonstrated that the process of defining the link between security and the environment is an ongoing endeavor. Due to the fact that there is not a single accepted approach in this debate, there is still space available for alternative conceptions. Since this debate over security and the environment largely comes out of the international relations tradition and since international relations as a whole has been somewhat hesitant to admit feminist approaches into the discipline, the full acceptance of perspectives that incorporate gender into discussions of security and the environment may not be immediate.[38] However, this is even more of a reason to take on such a project. Tickner (1999: 3) explains that part of the misconceptions between mainstream international relations approaches and feminist security studies is that critics see these scholars implying that "women are more peaceful than men or that a world run by women would be less violent and morally superior." Security and

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[38] Tickner (1997) argues that various misunderstandings exist between feminists and traditional international relations theorists; including the meaning of gender, the different realities or ontologies that inform their writing, and epistemological divides that make IR scholars question whether feminists are actually 'doing theory'.

environment discourses that incorporate gender will be useful in demonstrating the simplicity of such an argument because they are challenging the gendered nature of both security and the environment. The issue is not men characterized in one way and women characterized in another, but rather that gendered structures shape the actions and responses of all individuals. Incorporating gender into security and environment discourses will be beneficial both for asserting a gender-sensitive discourse on security and for highlighting the particular effects of environmental problems for segments of society.

Based on the analysis of the intersections between the current approaches to security and the environment and various feminisms, I assert that security and environment discourses that incorporate gender analysis and build on elements of the existing debate will be a fruitful addition to international environmental politics and international relations in general. The *environmental security* discourse represents some important conceptual space for gender concerns, therefore, including gender into the security and the environment debate will most likely come about through discussions between *environmental security* scholars and feminist scholars. While the *ecological security* discourse also has some conceptual overlap with feminist concerns, its ecocentrism makes it difficult to incorporate gender to a large degree. Below I elaborate on some of the elements that gender analysis brings to the current security and environment discourses.

Gender analysis stresses a multi-level analysis of security and the environment, paying particular attention to individuals and groups in society who face insecurities. These insecurities can take various forms and are best conceptualized as incidents that increase one's likelihood of experiencing danger, injury, or a decline in personal well-being. Examining these insecurities

will involve valuing the contributions of local knowledge as well as other forms of knowledge such as scientific.[39] Likewise, the notion of the environment that should be used is one that includes human and non-human nature as well as attention to the places where people live. To think of the environment as some distant, external entity masks the close relationships that exist between humans and non-human nature as well as the severity that many environmental issues have for the livelihoods of much of the world's population- including both women and men.

Resource conflict must be examined, but with specific attention paid to contextual and historic factors that contribute to violence and the impacts that violence has for members of the population in question. Rather than assume that scarcity is an unproblematic notion, it must be examined in order to determine how assessments of scarcity and plenty are arrived at, and for the benefit of whom. For example, one of the often cited cases of potential environmental conflict is war between Nile River Basin countries. Egypt is at the foot of the watershed, therefore subject to the actions of upstream states. Over the years, the government of Egypt has claimed that any decrease in their current access to Nile water would result in scarcity for the country, therefore they are prepared to go to war over access. This is despite the fact that Egypt has historically used by far the largest share of Nile waters largely because their upstream neighbors lacked the ability to increase irrigation or develop hydroelectric power capabilities (Allan 2001). This case shows the power dynamics that can be wrapped up in determining resource scarcity: Egypt is able to define scarcity for itself due to the relative power that the country has over its neighbors. These power dynamics must be assessed if one

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[39] I definitely see a place for scientific knowledge in security and environment discourses, however this type of knowledge must not be given primacy over the knowledge generated by the experiences of individuals.

is to fully understand the potential for conflict as well as all of the implications involved. This is particularly relevant for discussions of gender and the power dynamics that are wrapped up in gender relations across the globe.

Additionally, scarcity must not be thought of only in terms of a lack of access to a resource for human consumption. The needs of the environment to function productively must also be taken into account in order to determine scarcity in a given case. This reflects the fact that humans and non-human nature are inextricably linked and the insecurity of one has implications for the insecurity of the other. A detailed examination of scarcity will also bring to light the dominant relationship that humans most often claim over nature, which has links to other dominant relationships in society- North/South, elite/non-elite, and most importantly for this analysis men/women. This can provoke the questioning of the "normalcy" of these relationships and hopefully invite alternative understandings of the relationships.

This brings us to the issue of the potential causes of environmental insecurity. It must be acknowledged that by pointing to a single factor as causing environmental insecurity, that factor also becomes the subject of proposed solutions. Factors therefore must be examined with a specific attention given to the gender differences embedded within them. Issues of increased consumption often associated with accelerating globalization, growing population, and migrating populations are all cited as phenomena contributing to environmental degradation by scholars concerned with the environment. What must be realized is that while these factors might in fact produce environmental insecurities, they must not be taken as straightforward targets for solutions if these solutions do not examine any potential imbalanced impacts that they may have for segments of the population- women in particular.

Thus far, none of the perspectives on security and the environment have engaged in determining the particular impacts that solutions targeting the above-mentioned issues may have on women. This is a necessary task for discourses that incorporate gender concerns.

Security and environment discourses that include gender will also be amenable to solutions that reject the dominant institutional or societal structures. While sustainable development and environmental peacemaking may provide increased security for both the environment and some individuals in society, they do nothing to challenge the patriarchal structures that allow for the continuation of valuing male-ness over female-ness- thus they cannot be the final solution to insecurity. Through the analysis of environmental issues that directly impact people's lives, new discourses can both determine particular gender-differentiated impacts, responses and contributions to environmental degradation as well as call attention to the gendered assumptions in society through which these issues are typically understood.

In sum, some of the issues that are brought to light when gender is included as a fundamental aspect of security and environment discourses are as follows:

- Multilevel analysis of security and the environment are essential

- Broad and critical conceptualizations of security, environment, and scarcity are necessary

- Particular attention must be paid to the unique security situations of women

- A close relationship between humans and non-human nature must be acknowledged

- What happens during times of conflict as well as their causes must be examined

- The impacts of militarization on both the environment and human beings must be examined

- The causes of environmental insecurity must be critically assessed as well as their potential impacts for segments of the population

- Attention must be given to multiple sources of knowledge

- Potential solutions that reject the dominant institutional or societal structures must be entertained

I argue that many of these elements can be incorporated into existing security and environment discourses, particularly in the *environmental security* discourse and to a lesser extent, the *ecological security* discourse. What is necessary is a dialogue among scholars interested in these issues, rather than a complete revision of the debate.

Conclusions

In conclusion, including gender as a fundamental element of analysis in security and environment discourses represents an important opportunity for scholars to gain essential perspective on the security of both humans and the environment. Some important steps have been made thus far by scholars in terms of highlighting connections between security and the environment. It is now time to bring out the gendered elements both of these scholarly debates, as well as gendered elements of the topic of security and the environment itself for people's daily lives. Humans are interconnected with the environment, and as such the connections between security and environment represent an elemental livelihood issue for everyone on the globe. If we are to understand the ins and outs of these links, gender must be a focus of analysis due to its ever-present impact on how this topic is understood and its impacts on how environmental insecurity is experienced. At present, this is still lacking. For

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example, a 2009 International Studies Association panel entitled "Environment and Security: Critical Approaches," featured no mention of gender. Scholars who have been known to use an *environmental security* discourse and problematize elements of security scholarship still left gender issues untouched. This is particularly troubling given the important policy implications of security and environment discourses. The fact that they lack an inclusion of gender concerns makes the process of formulating policies to address security and environment links incomplete.

The next section explores these issues in practice by examining security and environment discourses in a series of water cases in the Ganges-Brahmaputra-Meghna basin. We can glean important insight about how both scholars and policymakers envision a connection between security and environment by looking at real-world examples. Additionally, these cases provide examples of the ways in which gender is being incorporated into security and environment discussions and, perhaps more importantly, how gender is currently absent from these discussions. The issues and topics of concern drawn from gender-analysis in this chapter will offer important areas in which to look for gender in the cases.

Chapter 4 - International Management of the Ganges-Brahmaputra-Meghna Water Basin

Transboundary water resources tie up all the states sharing a river basin into a tightly-knit and highly complex web of environmental, economic, political, and security interdependencies. This is because any manipulation of a shared river and its water flow by any riparian state inevitably has economic, environmental and security impacts on other riparian states (Arun P. Elhance 2000: 203).

I turn now to an examination of three cases of water issues in the Ganges-Brahmaputra-Meghna water basin, international basin management, flooding in the basin region, and impacts of agriculture on the basin. The goal of these case chapters is threefold: 1) to understand how security and environment links are made in practice; 2) to see whether and how gender concerns are considered in policy debates on environmental issues; and 3) to explore the practical implications of incorporating gender into discussions of security and environment links. These cases demonstrate the ways that discourses impact how issues of environmental change are understood in policymaking and political debates. By understanding when one discourse is used over others, we can also understand what this means for the foci, targets and policies that are likely to be addressed when discussing environmental issues. This fits into a larger goal of understanding the link between gender and discourses that combine security and the environment as discussed in chapter 3. Examining security and the environment through a gender lens gives insight into the gendered nature of international environmental politics and provides crucial redefinitions of concepts that are more useful for understanding environmental issues and for addressing them through the process of policymaking. Gender fits into each of the security and environment discourses in unique ways. If we understand which discourses are present in discussions of environmental change issues,

we can better understand how gender will be seen in these same discussions. Additionally, and perhaps more importantly, we can see how gender is absent in these discussions and the contributions that it would make if it were a fundamental element of analysis. The cases of water issues in the Ganges-Brahmaputra-Meghna water basin provide crucial insight into which discourses on security and the environment are currently being used to understand the relationship between security and water issues in one part of the world. This in turn offers information about where gender is likely to be incorporated in the discussion of these cases, as well as how gender can complement the discussions and aid in reaching effective solutions to important issues.

This first case chapter examines the discourses on security and the environment with regard to management of an international water basin; the Ganges-Brahmaputra-Meghna basin. I begin by presenting some background information on the case. I then move on to the specific discussions of management of the Ganges-Brahmaputra-Meghna water basin to demonstrate how discourses are seen in academic and policy writing. By examining a real-world environmental issue, we can better understand the types of discourses that appear in discussions of environmental issues in both theory and practice. From here I move on to discuss the role of gender in these policy discussions, and the potential role that gender could have in the future of these debates. I conclude with some reflections on what this case tells us about both the manifestation of security and environment discourses, and the role of gender in these types of discussions.

The Ganges-Brahmaputra-Meghna (GBM) river system, shown in Figure 2, is one of the largest hydrologic regions in the world. This large basin consists largely of the two tributary

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basins of the Ganges and the Brahmaputra rivers. These originate from the water sources in the

Himalayan mountain range. A smaller rainfed tributary called Meghna Barak, originating in the

Naga hills of north-east India, joins the Ganges-Brahmaputra near Dhaka and the total outflow

drains into the Bay of Bengal as the Meghna (Bandyopadhyay 2002). The total drainage basin of

about 1.75 million km is shared by 5 countries: Bangladesh, Bhutan, India, Nepal, and China.

The estimated population of the basin region is more than 600 million and growing.

Figure 2. Map of the Ganges-Brahmaputra-Meghna Water Basin:

Source: MSN encarta. (2008) Map of Ganges-Brahmaputra-Meghna Basin (drainage basin), Asia.,
(URL < http://encarta.msn.com/map_701607829/ganges-brahmaputra-meghna_basin.html>
(accessed 11/2/08).

Countries in the GBM basin have a long history of interactions and international negotiation or hydro-diplomacy. More attention is given here to Bangladesh, India, and Nepal due to their longstanding roles in coordinating basin management. The populations in these three countries are growing at an average rate of about two percent a year (Samarakoon 2004). The countries of this region remain heavily reliant on agriculture, with the majority of their populations depending on it for their living- meaning that water issues are livelihood issues for many in the area. "Water is a resource on which there is complete dependency and for which there is no substitute. As the demand for water has surpassed supply, with rival demands by various economic sectors, provinces, and sovereign states, this has led to increased competition, tension, and disputes" (Sahni 2006: 155).

Security and Environment Discourses in Ganges-Brahmaputra-Meghna Management

When I chose the cases to examine for this dissertation, I expected the case of GBM basin management to be heavily dominated by the *environmental conflict* discourse. I supposed this because the GBM is an international basin, and much of the scholarship that uses an *environmental conflict* discourse points to shared resources and scarcity as potential contributors to resource conflict. However, I found that while there was a large presence of the *environmental conflict* discourse, there was also a large presence of the *environmental security* discourse as well. There were occasional uses of the *ecological security* discourse, but these were fairly marginalized overall.

Environmental Conflict Discourse

Several elements of the policy discussions on GBM basin management have roots in an *environmental conflict* discourse. These include issues of resource conflict, allocation/scarcity, power dynamics, and a focus on the state level of analysis. The resource conflict storyline often dominates policy debates about this basin. For decades, scholars have discussed issues of water scarcity and international basin management with particular reference to the GBM basin (Bandyopadhyay 2002). It has been identified as a basin at risk for interstate or domestic conflict over water either in the short-term or long-term (Gleick 1993, Postel 1997, Wolf et al 2003). It is suggested that since it is a basin that is shared by several states, allocation issues are likely to arise which could lead to or exacerbate conflict (Faisal 2002). This relates to the scarcity storyline in the general *environmental conflict* discourse. Scarcity in the context of water issues often relates to allocation of the resource. If a state that has traditionally had access to a given amount of basin water suddenly experiences a loss in that amount, it may well view itself as facing water scarcity. For this reason, allocation tends to be a major obstacle to finding mutually agreed upon mechanisms of basin sharing (Biswas 1999, Dinar and Dinar 2000).

The allocation issues of India and Bangladesh sharing the waters of this basin goes back to partition in 1947. Canals and other irrigation systems that had been operating under a single entity now had to be separated into multiple new states. At Independence, India was already consuming a larger share of Ganges waters than was East Pakistan, later Bangladesh (Brichieri-Colombi and Bradnock 2003). In the years just after Independence, Indian water policy favored developing water resources as a way to develop the economy of the country. This included

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building large water projects, including large dams. During this time, the Indian government referred to dams as "temples of modern India" (Bandyopadhyay et al 2002: 4108). This policy has direct implications for its downstream neighbors, namely Bangladesh.

Strain between India and Bangladesh hit a boiling point when India decided to unilaterally build the Farakka Barrage in order to divert water from the Ganges to flush the port of Calcutta to prevent silting (Subedi 1999). Construction on the barrage began in 1964, despite protest from East Pakistan/Bangladesh. After the barrage came online in 1975, several adverse impacts stemming from the new flow of the Ganges afflicted Bangladesh, contributing to strained political relations (Brichieri-Colombi and Bradnock 2003; Libiszewski 1999). These negative impacts included loss of up to 90 per cent of the previous water flow during the dry season, which leads to a shortened agricultural cycle and a reduced harvest (Libiszewski 1999). In recent years, the basin has been experiencing water shortages in the dry season (November to May) due to significant withdrawal of the Ganges water inside India upstream of the Farakka barrage. "Due to the reduced surface-water inflow into the GDB, compounded with a higher sediment concentration that is typical of barrages (being near streambed releases), rivers have silted up and a salinity front from the Bay of Bengal has propagated far inland" (Mondal and Wasimi 2007: 179). This history demonstrates the difficulty of allocating of basin waters in a way that all states find acceptable.

Issues of power and position along the river have heavily impacted the management of the GBM basin. This relates to the unequal resource distribution storyline in the general *environmental conflict* discourse. India, as the dominant power among the immediate riparians, has largely had a dominant role in management schemes. India has largely been seen by other

riparians as a giant hegemonic neighbor who has historically gotten its preferred outcomes for management of the basin, particularly with regard to allocation of basin waters (Subedi 1999). Many scholars classify this as a typical situation due to the unique role for power relations in how hydropolitics will play out (Dinar 2002; Nishat and Faisal 2000). The Indian government has been accused of denying access to water data needed to begin and sustain negotiations, classifying the information as if in a military situation (Elhance 2000). This speaks both to India's unique position to be able to act in such a way, as well as the role that water plays in calculations of national security.

Additionally, because India is upstream from Bangladesh, it has been in a position to act unilaterally with water diversion schemes, thereby straining relations between the two countries.[40] Faisal (2002) explains that upper riparian countries like Nepal and Bhutan are largely concerned with their hydropower potential, which can be exploited in collaboration with India. Both currently have favorable ratios of per capita water availability, and thus have no major water-related problems with India. Bangladesh, on the other hand, is in the position of being uniquely dependent on the rivers that make up the GBM basin, and at the end of the line in terms of water use. This demonstrates elements of structural scarcity, an idea put forward as contributing to resource conflict by Homer-Dixon (1999: 15), a scholar who typically uses an *environmental conflict* discourse. Structural scarcity is caused by "a severe imbalance in the distribution of wealth and power that results in some groups in a society getting disproportionately large slices of the resource pie, whereas, others get slices that are too small to sustain their livelihoods." This situation also shows an instance of power stemming from

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[40] Postel and Wolf (2001) argue that unilateral construction/diversion on a shared river is a key factor in whether conflict will occur over water.

location or access to resources that is seen much more in the *environmental conflict* than the other two security and environment discourses.

Like the *environmental conflict* discourse in general, this case tends to be analyzed at the level of the state, with only passing mention of other levels of analysis. Nearly all of the GBM policy debates looks at management and the potential for conflict between basin states (between India, Bangladesh and Nepal in particular) without exploring substate conflict potential or other sources of insecurity. For example, Sahni (2006) mentions that there have been domestic water conflicts in India in the state of Punjab and between the states of Karnataka and Tamil Nadu, however this is only a brief discussion situated in the larger discussion of state level conflict in South Asia. Additionally, Corell and Swain (1995) use the GBM case to demonstrate interstate conflict issues in the region and use other regional cases as examples of sub-state conflict.

In sum, several elements of the discussion of GBM basin management are discussed within an *environmental conflict* discourse. These include identifying allocation/scarcity issues as important within the basin, pointing to power relations among basin states as determining how negotiations will play out, and focusing on the level of the state to explain the potential for conflict or cooperation in the basin. However, there are additional elements of the policy discussions that do not fit within an *environmental conflict* discourse.

Environmental Security Discourse

Elements of an *environmental security* discourse are also apparent in the policy debates on the GBM basin, including instances of cooperation, and human security concerns of water

management. As was discussed above, the GBM is often identified as a basin at risk for conflict. Despite it being so identified, most scholars are skeptical about the likelihood that violent conflict in the form of interstate war will occur over water in the GBM basin (Homer-Dixon 1999). This is similar to general skepticism over the "water war" thesis, with many scholars arguing that assuming that states will conflict over water without taking into account other factors is overly simplistic (Barnett 2001). GBM basin riparians have actually shown more of a willingness to cooperate than engage in any kind of violent conflict (Nishat and Faisal 2000; Samarakoon 2004).

Why we have seen evidence of cooperation rather than conflict is discussed from both an *environmental conflict* and an *environmental security* discourse. The *environmental conflict* discourse focuses on structural scarcity and unequal resource access. Many scholars argue that conflict in the basin is unlikely because of the extreme military asymmetry between the states with the most contentious relationship in the basin- India and Bangladesh. Since Bangladesh has never been in a position to challenge the dominance of India with regard to its actions in the basin, it has been forced to attempt to solve the matter diplomatically. This rationale for the lack of conflict in the *environmental conflict* discourse does not say that Bangladesh would not want to engage in violent conflict over access to the water in the GBM basin. Rather, the rationale merely says that the very conditions that contribute to structural scarcity in the basin, namely India's wealth and power, make it less likely that Bangladesh would be successful in a resource conflict and therefore will not engage in one.

While scholars who use an *environmental security* discourse acknowledge the unique challenges of international basin management, as well as the potential that sharing waters

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could lead to tensions, there is less focus on the conflictual side and more focus on the cooperative side. For example, rather than classifying the GBM basin as conflict-prone, Pirages and DeGeest (2004: 63), scholars who often use an *environmental security* discourse, discuss it as one among "several tense situations related to river systems." A tense situation may require more nuanced negotiations, etc.- but does not automatically mean that violent conflict is likely.

Whereas the *environmental conflict* discourse explains the lack of conflict in the basin with reference to power dynamics, the *environmental security* discourse focuses on environmental peacemaking. Remember that environmental peacemaking refers to high stakes environmental issues fostering cooperative relationships between states (Conca and Dabelko 2002). Sharing GBM basin waters can definitely be considered high stakes in a region where many people rely on the waters for their livelihood. Cooperation in the basin is demonstrated by the lengthy history of hydro-diplomacy between riparians. Most recently, India signed water-sharing treaties in 1996 with both Nepal and Bangladesh. In the case of the Ganges Treaty between India and Bangladesh, most scholars claim that the political climate had to be right before a solution could be put forward. According to Libiszewski (1999) since India had clearly established its position as the regional heavyweight, it became willing to engage in multilateral negotiations and relax its view of hydropolitics as a zero-sum game. This suggests that while states may have their own reasons to cooperate over resources, if they view it in their best interest- cooperation is possible.[41]

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[41] Faisal (2002: 311) argues that basin states must collaborate to "ensure lasting solutions to the common water-related problems such as flood, drought, erosion, sedimentation, and water quality deterioration." Likewise, Brichieri-Colombi and Bradnock (2003) claim that the GBM basin has an essential part to play in addressing poverty and increasing food security, all areas addressed in the *environmental security* discourse.

Evidence of cooperation between India and Bangladesh in particular is seen with their establishment of the Joint Rivers Commission (JRC) in 1972. Nishat and Faisal (2000) claim that very early on, the governments of these countries recognized the importance of resolving water-related contentions and attempted to aid the process by formally establishing the JRC within less than a year of Bangladesh's independence. The JRC statutes establish a range of functions: including aiding in flood control, and maximizing the benefits of common rivers. Additionally, this willingness to cooperate supports the environmental peacemaking thesis that despite the problems that may emerge from sharing resources, states will realize that they are better suited to find mutually acceptable solutions to environmental issues rather than get to the situation of conflict.[42]

However, this cooperation came after increased environmental insecurity for many within Bangladesh. Writing just a few years after the 1996 Ganges treaty, Libiszewski (1999: 134) explains

> Increasing numbers of Bangladeshi people who have lost their subsistence basis in the aftermath of the droughts and flood catastrophes, have migrated into the uplands of the Indian states of West Bengal and Assam. The regional government of the Bangladesh province of Khulna, the region most affected by the redirection of water flows, is actively supporting such emigration.

This experience of environmental insecurity by populations in Bangladesh deserves much more attention if we are to get a realistic picture of hydropolitics in the region. These are the expanded list of insecurities that come from broadening the discourse to the *environmental security* discourse. When we uncover and understand instances of human insecurity that are

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[42] Note that, like the *environmental conflict* discourse, the elements of the *environmental security* discourse discussed here also focus heavily on states as the principle actors. This is because states are central actors in the *environmental security* discourse, but not the only central actors. Other actors who play an important role in ensuring environmental security include NGOs and individuals.

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related to the environment, we can better manage the situation. This is a key distinction between the *environmental conflict* and *environmental security* discourses. The *environmental conflict* discourse devotes attention exclusively on the causes and consequences of resource conflict, mainly for states. The *environmental security* discourse, on the other hand, broadens the list of elements of environmental insecurity to include human security concerns at local levels.

The specific attention to flood control in the policy debates of GBM basin management brings in *environmental security* concerns for the welfare and security of humans from environmental change. The direct impacts of flood events for human populations will be discussed further in the next chapter, so it is sufficient to out that floods contribute to loss of life, loss of property/livelihood, spread of disease, etc. (Dhar and Nandargi 2001; Mirza et al 2001; Mirza et al 2003). Concern over drought is an additional environmental concern tied to human health. Droughts persist in many non-monsoon months, and present a large cost to basin inhabitants (Bandyopadhyay 2002; Chaturvedi 2001; Rees et al 2006). These human security concerns with ties to environmental change are the primary storyline in the *environmental security* discourse.

In sum, the *environmental security* discourse expands the focus of GBM basin management beyond merely examining the potential for conflict among basin states to considering the instances of cooperation/environmental peacemaking, and individual welfare in the region. Through this discourse we can better understand under what conditions states are likely to cooperate both for the good of state security and for the security of their populations. This discourse has space for considering human security concerns like impacts of floods and other water-related disasters.

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Ecological Security Discourse

The *ecological security* discourse is the least visible in the policy discussions of GBM management, although there are some occasions where it is found. Samarakoon (2004: 40) argues that the historical allocation of basin waters has been intended to support a variety of functions, including agriculture, domestic navigation, and industry, however it has rarely included an ecosystem function. "It is important to keep the rivers alive to support aquatic ecosystems and the coastal mangroves, which are dependent on the balance between fresh and saltwater. This goal requires adequate basinwide environmental and social impact assessment (EIA) and monitoring."

In most instances where discussions of GBM management turn to the protection of the environment for the good of ecosystems, it tends to be very brief and then return to concerns about the particular security of humans.[43] For example, in a discussion of the impacts of the Farakka Barrage, Samarakoon (2004: 38) says "the greatly diminished flow in the dry season allows salinity to penetrate inland through the estuarine river systems. Salinity limits opportunities for supplemental irrigation and fresh groundwater availability for human and industrial consumption." While the *ecological security* discourse does have a place for the security of humans within it, it is only in the context of examining the security of humans as a larger part of ecosystems. It is unlikely that industrial consumption uses would factor into the *ecological security* discourse.

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[43] Another example is in Chaturvedi (2001). There is a discussion of needing to consider environmental conservation conjunctively with water resource development in India in particular, though this line of reasoning does not fit prominently in the rest of the article. The focus is much more on the needs of humans.

This lack of the *ecological security* discourse may not be surprising to those familiar with basin states' approaches to water. For example, according to India's National Water Policy, adopted in 2002, "[i]n the allocation of water, first priority should be given for drinking water, followed by irrigation, hydro-power, ecology, agro-industries and non-agricultural industries, navigation and other uses, in that order" (Government of India 2006). Water for ecocentric purposes is fourth on the priorities list, following anthropocentric ones. Similarly, in Bangladesh's National Water Policy environmental functions of waters are considered after human needs. In a section titled "Water for the Environment" the document says

> Protection and preservation of the natural environment is essential for sustainable development. Given that most of the country's environmental resources are linked to water resources, it is vital that the continued development and management of the nation's water resources should include the protection, restoration, and preservation of the environment and its bio-diversity including wetlands, mangrove and other national forests, endangered species, and the water quality (Ministry of Water Resources 1999: 13).

Preserving the ecosystem is directly linked with sustainable development, meaning that the security of the environment is a concern only insofar as it impacts human health.

When I chose this case, I predicted that *environmental conflict* would be the discourse that was most prevalent. Discourse analysis of the policy debates of this case suggests that it is more difficult to unequivocally draw the conclusion that these policy debates fall solely within an *environmental conflict* discourse. Most of the policy discussions, even that which focuses on areas of conflict, also address other issues. This means, both the *environmental conflict* and the *environmental security* discourses are clearly present in the discussions on this case, with the *ecological security* discourse being marginal to most discussions.

Gender in Ganges-Brahmaputra-Meghna Management

In this section, I examine the role of gender in policy debates on GBM management in order to better comprehend the presence/absence of gender in this issue. I also seek to highlight the potential contributions that gender can make to understanding the connections between security and the environment. Incorporating gender will likely force security and the environment research to ask new questions and look at issues in different ways.

We can use the case of management of the GBM basin to explore where gender fits into a real-world environmental case and how its inclusion might alter the debate. This is important to the overall goal of the dissertation; to better understand how the inclusion of gender impacts debates on environmental change and security. Currently, gender fits into the GBM case only marginally in the overall policy debates. Gender analysis of various sources focused on management of the basin showed that gender was only rarely included.[44] This is consistent with my earlier claim that gender rarely emerges as a fundamental aspect for analysis within discourses on security and the environment. Despite an acknowledgement by many scholars of the unique relationship between women and water in many societies, this is rarely included in discussions of water management in this particular basin. There are brief mentions of the water needs of women in National Water Policies of the basin states. For example, in Bangladesh's National Water Policy, one stated objective is "To bring institutional changes that will help decentralise the management of water resources and enhance the role of women in water

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[44] Gender analysis involved tracing the presence/absence of gender and gender concerns in the policy debate documents. These documents included scholarly articles focused on the issue of GBM basin management, newspaper articles, policy position papers by state governments, etc.

management" (The Ministry of Water Resources 1999: 3). Additionally, "It is recognised that women have a particular stake in water management because they are the principal providers and carriers of water, main caretaker of the family's health, and participants in many stages of pre and post harvest activities" (The Ministry of Water Resources 1999: 9).

Despite these statements, it remains unclear how successful these states have been in actually involving women in water management projects, or how much of a priority women's water needs has been at the international level of basin management. For example, an examination of the 1996 water-sharing treaties between India and Bangladesh, and India and Nepal showed no mention of women's water needs or the position of women in water management measures. Additionally, Ahmad (2004: 92) argues

> Despite playing a very important role in the collection and management of water for domestic use, women enjoy little or no authority in decision making in water resources management. The knowledge and perceptions of women can be gainfully utilized in planning the water distribution network, designing and locating water pumps, and organizing the management of water supply facilities by the community.

This shows that while there is an acknowledgement of women's unique place in water issues, there has been little movement on involving them in the management process.

Although there is very little discussion of gender in the existing policy discussions on hydropolitics in this case, we can identify possible contributions that gender could make. Because this case is largely discussed in either the *environmental conflict* or *environmental security* discourse at present, there are shifts that are possible. For example, there would likely be a level of analysis shift from almost exclusively focusing on the level of the state, as is currently the case in both of these discourses. Scholars who study gender tend to focus on the causes and outcomes of insecurity, but also what happens during times of insecurity (Tickner

2001). For example, in the case of the GBM basin it is essential that scholars uncover what

happens to populations within states who experience water insecurity. Conca (2005: 75) argues

that

> The most common form of international water conflict today is not the
> interstate "water war" foreseen by many prognosticators, but rather the
> increasingly transnationalized 'local' conflicts between river developers and
> their opponents. These are triggered by the enormous financial, social, and
> ecological costs of large water-infrastructure projects, the often highly
> skewed distribution of benefits, the tendency of river-development advocates
> to oversell benefits and understate costs, and the trail of victims such projects
> often leave in their wake.

Research that incorporates analysis of these types of struggles into the larger picture of GBM

basin management are essential if we are to understand and address all types of insecurity. This

focus is particularly important in order to understand the specific ways that men and women in

the region experience water insecurity. As was demonstrated in the discussion above, the

environmental security discourse includes space for these types of human security concerns to

be addressed, and would be strengthened if it also included an examination of the differential

human security vulnerabilities of men and women.

Tied to this is the idea that we must be reflexive about the labels that we use to

understand conflict. An overview of the GBM policy discussions that is situated in the

environmental conflict discourse suggests that populations can easily be labeled as "conflict-

prone" without digging deeper to determine whether other factors are at play. When

discussing water conflict in India, Myers (1996: 52) claims that "constant clashes have erupted

in Punjab, where Sikh nationalists claim too much of their water has been diverted to the Hindu

states of Haryana and Rajasthan." When discussing the same conflict, Shiva (2002: xi) claims

> In Punjab, an important component of conflicts that led to more than 15,000
> deaths during the 1980s was an ongoing discord over the sharing of river
> waters. However, the conflict, which centered on development
> disagreements including strategies of the use and distribution of Punjab's
> rivers, was characterized as an issue of Sikh separatism. A water war is
> presented as a religious war. Such misrepresentations of water wars divert
> much-needed political energy from sustainable and just solutions to water
> sharing.

Whichever view is correct, this apparent disagreement implies that these types of water tensions need to be understood for their complexity rather than attempt to have them fit into a water conflict mold. Critical approaches, like the feminist approaches that I advocate incorporating into security and environment discussions, include a call to be reflexive about our scholarship. This includes contemplating multiple sides to any story.

Incorporating gender would lead us to ask different questions when exploring the management of the GBM basin. The first of these questions would be, do men and women experience on the ground water issues differently? As the case is discussed now, there is little consideration of particular gendered issues relating to water. This is despite some evidence that there is a disproportionate time burden that water collection places on women and girls, and that there are specific health impacts for women from daily water carrying from water sources (Ray 2007). Management schemes should recognize these gender differences and make an attempt to specifically address the needs and concerns of women, who are the primary water providers in the GBM region.

Another question might be who has the authority to speak about and take part in basin management? For example, rather than accepting that cooperation in the basin is good and the mechanisms for this cooperation are desirable, we need to understand the gender components of these issues. A case in point is the Joint Rivers Commission (JRC). As mandated in its statutes,

the JRC has a set number of engineers at all times- two of the four members of the commission team from each country must be engineers (Nishat and Faisal 2000). This leads to broader questions about the issue of expertise, and typically male expertise. Strang (2005: 33-34) argues that moves toward technological management at the hands of experts has shifted the relationship between humans and water.

> Technological change has...enabled the physical alienation of water not only from women, but from local communities and, eventually, from the bulk of the population...Thus the physical management of water that used to be everyone's business, and especially women's, is now carried out by a very tiny number of people, the vast majority of whom are men.

Wolf (2000) explores a similar topic by examining indigenous water management techniques in two drylands regions, suggesting that rather than being content to see water knowledge determined by some type of scientific "expertise," there is much to learn from those with historically close ties to water. Deferring to the unique water knowledge of women represents a similar situation. There is evidence to suggest that women's participation is extremely limited in current water supply projects in India, despite specific pressure from the Indian government to increase their involvement (Prokopy 2004).[45] This means that there is less of a chance that their unique knowledge is being used to find appropriate management schemes.

Additionally, if gender were more fully incorporated into discussions about international basin management, there would possibly be more of a focus on the environment for its own sake and less of treating it as a "resource" for human consumption. The fact that there are only scattered references to protecting the security of the environment as a goal in and of itself

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[45] An annual report put out by the Ministry of Water Resources in India states that "[c]onsidering the importance of women in terms of their numerical strength and the significant contribution they make to the agriculture labour force, there is a need to encourage participation of more women in Water User's Associations by strengthening the Acts or by bringing in a new culture among the water users" (Ministry of Water Resources 2006: 91). There is no discussion of specific measure to ensure this increased participation, however.

demonstrates the way that "the environment" is conceptualized in the current policy discussions on GBM management. The waters of the basin are typically seen either a possession or as a means of ensuring human security. Although most feminisms also tend to focus their concern at the level of humans, ecofeminists tell us that regarding the environment as an entity that humans can dominate has important parallels for other relationships based on domination, including male domination over female (Warren 1997). Using this insight to examine the GBM basin case will lead to envisioning the environment as an entity that has the right to exist for its own sake.

Finally, there would likely be a more nuanced understanding of the basin states and more of a focus on alternative forms of development- less focused on economically defined development. Biswas (1999: 429) represents a discussion of international water management that assumes that economic development is desirable and a high priority goal for states. He says "since all exclusively national sources of water that could be used economically have already been developed, or are in the process of development, there would be tremendous pressure to develop international water bodies, which are often the only new sources of water that could be used cost-effectively." Similarly, Samarakoon (2004: 37) says "despite all these indicators of poverty and backwardness, the GBM region is water-rich." These quotes present basin states as poor, backward, and typically reliant on outside help to "develop" the watercourse. On the other hand, Shiva (2002, 2005) presents an alternative view for the future of basin states, and India in particular. She argues that water management schemes were more sustainable before they were tied to things like expertise and pricing (Shiva 2002). She identifies the sacred tie to water that Indians have traditionally experienced as a more desirable way to

value water and use it in sustainable ways.[46] For her, conducting water management schemes at the level of the state and based on "modern" modes of relating to water mask the important relationship between humans and the environment that they rely on. These different perspectives demonstrate that we must ask a range of questions about how local water users, many of whom are women, relate to their environment and want management schemes to be carried out. Given the broad nature of the *environmental security* discourse and the range of concerns incorporated in this discourse, a dialogue between feminist scholars and scholars who use an *environmental security* discourse may be a fruitful place to explore these issues.

Conclusions

In this chapter, I have used the ideas of discourse and gender in order to both better understand the particular case of management of the GBM water basin, as well as to understand the role of ideas in shaping global environmental politics in general. By using discourse analysis to analyze the discussions of GBM basin management, I was able to demonstrate that the *environmental conflict* and *environmental security* discourses are currently the most prevalent for discussing this case. Policy issues always include multiple discourses, but typically end up with one or two discourses becoming dominant (Hajer 1995). Those discourses that become dominant have a greater impact on policy outcomes. In this case, the *environmental conflict* and *environmental security* discourses are the most likely candidates

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[46] Rivers are often considered to have religious significance in this region. In the aftermath of floods along the Kosi river, known as the "river of sorrow," people prayed to the river as a goddess to ease their suffering (Buncombe 2008).

to inform the policy process, because they are the most visible. Additionally, I found that gender is an extremely marginal part of these policy discussions. There are only occasional, brief, mentions of water needs of women. However, by using insight from various feminisms there are several contributions that the inclusion of gender can make to discussions of this case, including broadening the scope of analysis, asking new questions, and conceptualizing key concepts in more encompassing ways.

Chapter 5 - Flooding in the Ganges-Brahmaputra-Meghna Basin

Flooding of catastrophic proportions often occurs in the GBM river basins. Extreme precipitation in the monsoon, together with the physical settings of the river basins has caused many severe floods in the last few decades. Causes and characteristics of floods vary between the highlands in Nepal, the middle ground in India, and the flat deltaic terrain in Bangladesh (Mirza et al. 2001: 39).

This chapter explores the recent intense flooding within the GBM basin that have been traced to naturally occurring phenomena and to river development schemes. It will begin with a background discussion of the case of flooding in this region. I then move on to discourse analysis of the case, in which I identify whether and how each of the security and environment discourses appear in discussions of the case. Next, I conduct gender analysis of the case in order to trace the presence and absence of gender in discussions of flooding. Finally, I conclude with a discussion of how this case is likely to change in the future due to climate change predictions.

Flooding[47] is a consistent part of life within the Ganges-Brahmaputra-Meghna basin. According to Dhar and Nandargi (2001: 104) floods occur in the river systems during the monsoon months of June to September every year. "In some years floods do occur in Brahmaputra river right from the month of May and continues to occur up to mid-October. In the case of Ganga, floods occur very rarely in the month of June but do occur till about the first week of October. The maximum frequency of floods in both these river systems coincides with the monsoon period of June–September." Flooding does not always occur evenly or consistently throughout the basin (Mirza et al 2001). Of the basin countries, Bangladesh

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[47] Although much of the media attention is on flooding, drought is also a substantial problem within the basin region (Bandyopadhyay 2002; Chaturvedi 2001; Rees et al 2006). Droughts persist in many non-monsoon months, and present a large cost to basin inhabitants.

experiences the worst of the flooding, followed by India. In extreme cases, floods may inundate

about 70% of Bangladesh, as occurred during the floods of 1988 and 1998 (Mirza et al 2003).

While flooding is a naturally occurring phenomenon in the region, the extent of flooding

in the recent past has raised questions regarding why the patterns are shifting. Some speculate

that river development schemes are transforming the natural paths of the river, with

unintended consequences such as increased flooding. Mondal and Wasimi (2007: 185) discuss

India's water development plans by claiming that

> Under a long-term master plan, India is planning to transfer surface water
> from surplus areas to deficit areas through interlinking its rivers. Under the
> proposed plan, as reported in newspapers and web pages, a large number of
> storage reservoirs, dams, canals, etc., would be constructed to interconnect
> the Himalayan and peninsular rivers of India. Although it has been reported
> that the existing [water treaty] with Bangladesh will not be violated as trans-
> border rivers will not be linked and that the "surplus flood water" will be
> diverted, Bangladesh has already opposed the proposed plan fearing that the
> dry season flow of the Brahmaputra River in particular would be reduced
> once the plan is implemented.

Not only are there concerns about Bangladesh's access to water in the dry season, but also

whether schemes such as this will impact the basin in other ways, including worsening floods.[48]

Some of the problem with flooding also likely stems from the international nature of the

basin. For example, both India and Bangladesh have built flood control embankments on a

number of major rivers that flow between the two countries. However, due to border

regulations, these embankments may abruptly end near the border leaving an opening through

which floodwater can spill into flood plains. "This type of hydraulic leakage can undermine the

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[48] This concern is shared by practitioners outside of South Asia. UN Water (2006b: 4) explains that
"[f]ailure to limit environmental degradation resulting from human intervention can increase the vulnerability to
risks posed by natural hazards. The 2004 catastrophic floods in Haiti, highlighted the lack of effective land
management, the exploitation of charcoal as a domestic fuel and consequent deforestation, which combined
together, enhance the country's vulnerability to floods and mudslides. The neighboring Dominican Republic
depends entirely on natural gas for cooking and as a consequence does not have similar problems."

safety of the embankments and cause prolonged flooding particularly in the downstream area" (Nishat and Faisal 2000: 292). Additionally, there has been some complaint about a lack of access to flood data in Bangladesh which makes planning for floods difficult (Chowdhury 2003). While the countries of the basin have attempted to coordinate efforts in many respects,[49] water data is often considered a matter of security by the Indian government- making them less likely to share the data even for humanitarian purposes (Srinivasan 2008). In an interview with R.K. Srinivasan, he told me about the challenges that this presents to those doing research on water issues in India, including NGOs.

In the summer of 2008, the Kosi river flooded portions of India and Nepal, with some of the worst damage occurring in the Indian state of Bihar. The river burst its banks in Nepal, which sent a flood of water across the eastern portion of the Himalayas into regions that do not typically see monsoon flooding. This was one of the worse instances of flooding in India in several years. There was significant damage to life and property. India's Disaster Management Division estimated that more than 2.6 million people in 16 districts have been affected by the flooding, although aid organizations put these numbers much higher (Ramesh 2008b). There have been reports of widespread health problems like waterborne diseases, and extensive property and livelihood damage, particularly to agricultural land. This flood has renewed discussions of the causes of flooding and government responsibilities to flood victims.

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[49] Many of the functions of the Joint Rivers Commission, the water coordination organization between India and Bangladesh, deal explicitly with flooding (Nishat and Faisal 2000).

Security and Environment Discourses in Ganges-Brahmaputra-Meghna Flooding

The previous chapter on international GBM basin management demonstrated that security and environment discourses do not always appear in the ways that one may predict. The case of flooding exhibited the security and environment discourses in ways much more consistent with my starting predictions. I thought that because flooding has an immediate impact on the health and security of human populations, there would be a predominant use of the *environmental security* discourse for discussions of this case. For the most part, this is what occurred. There were occasional uses of the *environmental conflict* and *ecological security* discourses, but these were marginalized overall.

Environmental Conflict Discourse

The *environmental conflict* discourse is not heavily used in the discussions of this case. The major themes discussed in this case rarely include concern about the potential for resource conflict, a dominant concern in the *environmental conflict* discourse. Some of the storylines relevant to *environmental conflict* include a state's ability to provide for the security of its people in the face of environmental disasters, and ensuring the security of the state through economic security. If we bring in concerns about environmental degradation negatively impacting the security of the state, then there is some evidence of this storyline in the case. For example, Bangladesh receives a significant amount of help to provide flood prediction data/measures from Western states (Mondal and Wasimi 2007). If we consider the dependent relationship this may suggest, this looks like Bangladesh relies on other states in order to

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ensure its security- either for the state or its citizens. This may call into question the extent to which Bangladesh independently controls its security.

A second storyline with ties to the *environmental conflict* discourse is ensuring the security of the state through economic security. One way that this links to water issues is through using sustainable development to promote economic security. This is the strategy behind developing the basin's hydroelectric potential (Bandyopadhyay 2002). Chaturvedi (2001: 315) argues that this is a necessary path for India in particular. He argues that "[s]ustainable development for the developing countries means achieving their rightful place in the global community. As a corollary, this means an urgent endeavor to achieve leadership in science and technology." This suggests a strategy of achieving the security of the state within the international community by economic development. This calls to mind the idea of surviving in an anarchic community, where a state must rely on itself to achieve security.

Perhaps there is little discussion of this case through an *environmental conflict* discourse because it is not a case where scarcity is as prevalent. Scarcity is one of the central storylines of the *environmental conflict* discourse, in which it is argued that populations will often engage in violent conflict over access to a scarce resource. In the case of flooding, however, there is not as direct a link to scarcity issues. This may tell us something about the types of issues likely to be dominated by an *environmental conflict* discourse. Homer-Dixon (1999: 12) argues that "scarcities of critical environmental resources- especially of cropland, freshwater, and forests- contribute to violence in many parts of the world." There is evidence to suggest that communities may experience scarcity of cropland in the aftermath of floods, however there is

no discussion about populations engaging in conflict over access to agricultural lands in this case.

Environmental Security Discourse

The *environmental security* discourse is evident in this case to the largest degree. Storylines seen in this case with a link to the *environmental security* discourse include concern over the health of human populations, the inability of a state to provide for the human security of its population, concerns over food security, the role of humans in worsening flood events, and using dams to ensure environmental peacemaking. Flooding is largely regarded as a problem for the basin because of the extreme threat to human health and well-being it brings. Flooding, like other water-related disasters, bring destruction and disease to the population that experiences it. According to UN Water (2006a: 2), "[b]etween 1991 and 2000 over 665,000 people died in 2,557 natural disasters of which 90% were water-related events...Losses stemming from disasters have greater impact in developing countries as compared to developed countries. More than 95% of all deaths caused by disaster occur in the developing countries." As is the case with many environmental disasters, flooding hits vulnerable populations first (Mirza et al 2003: 289).

Inhabitants of the GBM basin die in floods each year. A USAID report in 2007 listed the numbers of flood deaths as 563 dead in Bangladesh, 2,253 dead in India, and 146 dead in Nepal (USAID 2007). Additionally, disease is a major concern for those who experience flooding. "Diseases like malaria, filaria, acute diarrhoea, cholera, typhoid and hepatitis have fluctuated over the last years. The incidence of most of the diseases is highly correlated with the

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occurrence of torrential rain and floods" (Niemczynowicz et al 1998: 210). After floodwaters

recede, populations often lack access to safe drinking water. This increases the chances of a

spread of waterborne diseases (Narayana et al 2007).

The case of flooding may also speak to the inability of a state to provide for the human

security of its population. With the 2008 flood in Bihar, the Indian government was criticized for

its slow rescue response, and for trying to downplay the scale of the disaster (Ramesh 2008a).

This is a continuation of states being criticized for their handling of disaster situations.[50] In the

2007 floods, the Indian state air dropped food packets to affected families which contained

uncooked foodgrains. Aid groups censured the move, arguing that these families were in no

position to cook food, and instead needed dry food (Narayana et al 2007). The same year the

state ran out of food to distribute. This calls into question the ability of states to ensure the

security of their populations at an individual level.

An additional element of the *environmental security* discourse is concern over the

damage to property experienced during floods (Dhar and Nandargi 2001; Ghani 2001). The

floods seriously threaten food security,[51] livelihood and health (Dhar and Nandargi 2001; Mirza

et al 2003). Floods cause considerable damage in the GBM basins and four main economic

sectors—agriculture, housing, industry and transportation infrastructure. "Flood related

damage puts considerable strain on the economies of the countries that share the GBM basins.

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[50] There is often criticism of states' competence in handling natural disasters in both the global South and the global North.

[51] This is not to say that flooding is only accompanied by negative impacts. Mirza et al (2003: 289) claim that flooding does provide some benefits in terms of food security. "For example, normal floods help the growth of rice crops because of the fertilization produced by nitrogen supplying blue-green algae, which grow in the ponded clear flood water. The extra moisture provided by large floods to higher lands also benefit *rabi* crops such as vegetables, lintels, onion, mustard, etc." The question is whether flood waters bring necessary nutrients or not or to consider the tradeoffs between benefits and losses like damage to homes, etc.

This is particularly true in terms of diversion of resources for recovery activities and the loss in growth of gross domestic products (GDP)" (Mirza et al 2001: 40). Flood waters have serious impacts on agricultural lands, often decreasing productivity for some time (Narayana et al 2007). The 2008 flooding of the Kosi is estimated to have damaged 125,000 hectares of agricultural land, a staggering figure in light of the deep reliance that many in this region have on agriculture for their livelihood (Gupta et al 2008). This, coupled with the difficulties that basin states have had with supplying flood-affected populations with food, make food security concerns prevalent in the short-term and longer-term.

An interesting theme in this case is not only the negative impacts that environmental degradation have for human populations, but also the role that humans play in bringing about this degradation and the ensuing negative impacts. In the case of flooding discussions, many point to human development efforts and migration patterns as worsening an already persistent problem. Mirza et al (2001) find that flood events are not necessarily getting worse, despite worse flood damage in recent years. They attribute this increase in reported flood damage to things like improved flood damage assessment techniques and the patterns of human settlement in the basin region. This suggests that both our knowledge of flood events is getting better, and that more and more people are being impacted by floods because of population movement.

Population pressure and its impacts on the environment is a persistent storyline in the *environmental security* discourse in general. In terms of this case, population increases means more people impacted by flooding in loss of life, loss of property, and loss of livelihood (Ghani 2001; Mirza et al 2001). This is recognized by the government of India, which in its 2002

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National Water Policy states that "[t]here should be strict regulation of settlements and economic activity in the flood plain zones along with flood proofing, to minimise the loss of life and property on account of floods" (Government of India 2002: 7). Despite these acknowledgements, it is very difficult to regulate population settlement in the basin states. Mirza et al (2003: 315) explain that "[i]n terms of population, more people will be vulnerable in future, as an increased number of people will be living in the floodplains of Bangladesh. More houses and infrastructure will be exposed to flooding and the likelihood of increased damage is high."

Besides population increases in the basin region, there is also discussion of the practice of changing the environment to suit human needs only to unintentionally cause environmental damage which in turn harms human security. In some instances the very mechanisms that were built to manage flooding have been blamed for making them worse (Narain 2008). In a 1992 report by the People's Commission on Environment and Development India, D. K. Misra warned that building embankments, coupled with decreasing forest cover,[52] increases the sediment load in rivers, which can weaken embankments to the point of breaking and cause worse flooding. Ajoy Bagchi (2008), the executive director of the organization, told me in an interview that this is exactly what happened to cause the 2008 flooding on the Kosi river. Building embankments also block natural drainage channels, which often results in increased water-

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[52] There is some disagreement about the extent to which deforestation contributes to worsening flood events. Ghani (2001) and Shiva (2002) have pointed to a connection between the two, while Mirza et al (2001, 2003) have questioned the extent to which this impacts flooding.

logging. It is estimated that increased water-logging along the Kosi has affected around eight million people (Gupta et al 2008).[53]

In addition to building embankments, there has also been a tendency to build dams in the GBM basin in order to harness hydroelectric power of the rivers (Bandyopadhyay 2002; Ghani 2001; Shibusawa 1987; Subedi 1999). Chaturvedi (2001: 308) says "[t]here has been much controversy about large dams. In our judgement, this is totally irrelevant as far as South Asia and many developing countries are concerned. Considering the hydrologic conditions of South Asia, multipurpose dams are a must." This echoes the logic discussed in the *environmental conflict* section, that states should use the environment or resources to ensure the security of their population.[54] However, some point out a conflict between two of the main objectives of dams: electricity generation and flood control. "For electricity generation, authorities have to keep reservoirs at high levels. But flood control calls for lower levels. As electricity generation earns them revenue, the authorities try to keep reservoir levels as high as possible. Hence, they are at high levels before the monsoons" (Bhatta 2007: 27). This means that flooding can easily occur if reservoirs exceed their capacities. Additionally, many dams have been built to serve irrigation needs and not for the specific purpose of managing floods. Bandyopadhyay et al (2002) cite that of the 4,291 dams in India, 96 percent cater to irrigation needs while less than 0.5 percent meet flow-regulation objectives to mitigate flooding. This

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[53] Building embankments can also have a negative impact on food security. "Embankments will also influence many of the beneficial effects of the monsoon, including the wet season fishery, which contributes over 70% of the Bangladeshi animal protein intake, and which is the second largest export after jute...Fish stocks have declined in the main Ganges channel in recent years as a result of flood control and land use practices" (Allison 1998: 832).

[54] This motivation does not always have the same results for all of the populations involved. The issue of population displacement related to the building of large dams would run counter to the goal of using the environment to ensure human security.

means that states have to make choices about how they are going to use the environment within their territory, and to what ends.

Discussions of dam projects in the GBM basin also relate to another *environmental security* storyline- environmental peacemaking. Bandyopadhyay (2002: 141) argues

> There is little doubt that, in order to promote river basin co-operation, dam projects in trans-boundary river basins need to have the support of all the countries affected by the project. While international rivers have often been projected in the past as the sources of conflicts and wars, with the present availability of remote sensing and fast communication of data they do offer new avenues for co-operation to the co-riparian nations. The [World Commission on Dams] has, in this way, given a fresh push for collaborative decision making on dams in the international river basins.

Collaboration on high-stakes issues like water access and flooding is expected to yield ties between riparian states, which makes them less likely to engage in conflict over access to the basin. There are also discussions about the need for cooperation in order to ensure environmental security for all basin populations. Samarakoon (2004: 39) says "[s]ince 93% of the catchments of the GBM river systems are situated outside Bangladesh, regional cooperation among the co-riparian in flood forecasting would contribute to reducing damage to life and property in the short-term until structural measures are implemented." Additionally, a lack of cooperation has been blamed for worsening the impacts of flood events. In discussion about flooding of the Kosi river in 2008, Nepal has blamed India for failing to maintain the river's embankment in accordance with a 1954 bilateral treaty (Ramesh 2008a).[55]

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[55] The Kosi's embankment is supposed to handle around 1m cubic feet of water per second, however the river was breached at around one tenth of capacity. Many point to this as evidence that the embankment was not maintained to appropriate standards (Ramesh 2008a).

Ecological Security Discourse

Like the *environmental conflict* discourse, the *ecological security* discourse is

marginalized in the discussions of this case. This is interesting in light of the fact that existing

flood patterns as well as predicted future flood patterns have significant impacts on the health

of the ecosystem. There are only a few authors who highlight the negative impacts of human

behavior for the environment. For example, Allison (1998: 834) has argued that the GBM basin

"faces a number of environmental issues stemming from habitat modification and rapid

population growth. Among these are rising sea level and saline intrusion, water rights, inland

and offshore fish stocks, flood control, soil fertility, water-borne pollutants, and river channel

migration." He goes on to argue that many of the geological processes involved are poorly

understood, which makes environmental decision-making difficult. Additionally, flood control

mechanisms have impacts, sometimes negative, on the river systems, something that could be

discussed through an *ecological security* discourse. India, Bangladesh, and Nepal have built

floodwalls and embankments in order to mitigate the impacts of floods on villages and cities

(Rabinowitz 2007). However, there has not been a significant move towards studying the

impacts of these projects for the environment itself. Writing in 1993, Zaman argued "[t]o date,

hardly any scientific research has been done into the possible impact of flood control on the

biotic diversity and ecological complexities of the delta" (995).

Again, like the case of GBM basin management, there are occasional paragraphs about

the needs of the environment. For example, in an article about developing India's waters,

Chaturvedi (2001: 311) argues

> Traditionally, environmental conservation has been undertaken as an
> afterthought in water resources development. Our point of departure is that

it should be considered conjunctively with it. Thus, besides conducting environmental impact assessment of the developmental activities and trying to mitigate the adverse affects, we may examine the question how to implement environmental conservation and manage it as one of the multiobjectives. For example, one of the functions of the multipurpose dams may be to release water from ecological considerations in the low flow season.

Despite this focus on the needs or security of the environment, his overall message is that countries in South Asia must cultivate their water resources for the sake of development. He says very little about what happens when the needs of the environment and the needs of humans come into conflict with one another.

There has been increased pressure to evaluate the environmental impacts of things like dams by NGOs and the World Commission on Dams in particular. Bandyopadhyay (2002: 141) calls this increased awareness "ecohydrology." "For this emerging body of ecologically informed inter-disciplinary knowledge on water resources, the term 'ecohydrology' is being coined. Consequently, integrated water resource management constitutes the holistic strategy for water resource management supported by this inter-disciplinary knowledge base." However, there remain many sources that give little attention to the needs or security of the environment itself (Dhar and Nandargi 2001; Ghani 2001; Mondal and Wasimi 2007). For example, Dhar and Nandargi (2001) offer a broad discussion of water policy in India, yet there is almost no mention of the ecological impacts of water development, etc. While there has been some awareness of the impacts of development on the environment, this remains a second thought for most scholars and policy makers with regard to this case.

The fact that the *ecological security* discourse is marginal to this case may stem from the visible impacts that flooding has for human beings. Policy makers and the media often tend to

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focus on environmental issues in an anthropocentric manner rather than an ecocentric one. It is

a much more captivating story, and one more likely to get policy attention, to focus on diseased

populations and property damage following floods rather than on the impacts on the

environment itself. However, there may be increased attention to both the needs of humans

and the environment if climate predictions for the region are accurate. Many climate change

forecasts predict that existing cyclones and floods will occur more frequently and with

increased force (Mirza et al 2008). Additionally "geological events stimulated by changes in

temperature will mean intense pulses of rainfall followed by periods of drought, and a potential

collapse of the monsoon cycle itself" (Anam 2008: 1). Bangladesh in particular is expected to be

significantly impacted by climate change. There are predictions of increased flash floods and

changes in land inundation categories (Mirza et al 2008). A largescale shift of this nature would

deeply impact the ecosystem of the basin. To what extent these concerns would be considered

without being tied to the health and well-being of human populations and the state is another

matter.

Gender in Ganges-Brahmaputra-Meghna Flooding

Gender is not discussed in this case to the extent that I expected. Since this case is

heavily dominated by the *environmental security* discourse, and this is the discourse most likely

to address gender issues, I expected gender to be explicitly discussed in several areas. At the

very least, I expected to see some discussion of how men and women experience flooding

differently. There were a few mentions of this issue. For example, in reports after the extreme

flooding in Bihar in 2008, aid workers documented dalits, or "untouchables," being rescued last and getting the smallest share of rations. "In one camp, it was reported that a dalit man was rescued by boat because he was the village headman, but his wife and four children were left behind despite promises to the contrary" (Ramesh 2008c: 1). This speaks to both gender issues and caste issues within India. There is a hierarchy to flood rescue practices that places women at the bottom, even among the lowest caste. Part of this likely stems from the fact that Bihar is a rural state and one of the poorest in India, but it also speaks to larger gender dimensions of the case.

Thompson and Sultana (1996: 7) argue that floods have different impacts on women compared with men. "The restricted mobility of women and their particular responsibilities mean that the main problems they report in floods are cooking, collecting drinking water and toilet facilities. There is also shame where women have to move to public places to shelter from floods. Female-headed households are particularly badly affected and vulnerable in severe floods." These needs should be addressed by disaster relief operations in the aftermath of flood events. As was mentioned above, relief efforts in the past have not always adequately considered the role that women play in food preparation. Food distributed after floods sometimes requires cooking (which the women are largely expected to do) without the facilities provided to do this.

In addition to these issues, there are other things that come to light when we view a case like this through a gender lens. With the introduction of gender into the case of flooding in the GBM basin, we can use insights from feminist analysis to speculate about what gender would look like if it were a more central element of this case. For example, introducing gender

into a case like this would give us a lens through which to view issues like vulnerability and justice. In addition to justice issues tied to rescue efforts, there are also justice issues in the aftermath of many disasters. The organization Save the Children has reported increases in child trafficking after past flood events. Their chief executive officer says "[d]uring our flood response last year we found that the levels of children trafficked from the state increased in large numbers. Two of the affected districts, Arraria and Katiyar...have the highest instance of child trafficking. The current disaster will increase levels of poverty and desperation and create a favourable environment for traffickers" (Ramesh 2008a). A feminist lens allows us call attention to this element of the case by asking questions like "what happens after disaster situations as well as during?" This echoes feminist analysis examining what happens during and after conflict situations. It involves seeking to understand the different types of vulnerabilities that populations face. In this case it is children who, like women, are often placed in degrading situations because of their precarious position in society.

Viewing the issue of flooding through a gender lens also allows us to ask the question "who benefits from flood management schemes?" There is evidence to suggest that some segments of the population benefit more than others. After Bangladesh implemented a series of flood control measures in the early 1990s, large landowners accrued the most benefit, but laborers and small farmers did also see some rewards. Those most disadvantaged were those who made their livelihoods directly from the rivers, namely fishermen and boatmen, and those who lived close to embankments (Thompson and Sultana 1996). The projects offered no measures to compensate those who were adversely affected. A critical approach, like feminism, is much more likely to question whether elements of power are at work here and what the

larger impacts of these practices are. If benefits are going to the most powerful in society, and women are rarely ever the most powerful, then it follows that women are largely excluded from seeing a large portion of benefit in these schemes. Likewise, the poorest in this region are disproportionately impacted by flooding. Mirza et al (2003: 289) say "[a]lthough flood affects people of all socio-economic status, the rural and urban poor are the hardest hit." Because women tend to represent a large portion of the poor around the world, we can deduce that women are also disproportionately impacted by flooding as well.

Unlike the case of GBM water management, flooding is one area where there is attention to levels below the state. Most of the discussions surrounding flooding make reference to the regions within basin states most vulnerable to flooding, and the populations who are most impacted. For example, flood disaster response will often look different among the different states of India. This attention to levels below the central state may mean that there is some space to include women in disaster decision-making and address some gender considerations. Some scholars have suggested that there are often opportunities to incorporate the voices and expertise of women at levels below the state much more so than within the central state (Enarson and Morrow 1998; Mishra et al 2004).

Another insight from feminist analysis that can be applied to security and environment issues is problematizing key elements of study. In this case, both security and environment are conceptualized in fairly broad terms. Security is somewhat problematized in that the case is mostly discussed as concern for human life, health, and well-being. However, there is little to no consideration of the unique security needs of women and men. One difference is the different medical needs that women have in disaster situations. There were reports of pregnant

women without access to medical help delivering babies after the 2008 floods in Bihar (Gupta et al 2008). This is an explicit example of a unique human security need of women. Mishra et al (2004: 226) argue that "the circumstances of women's lives determine how they are affected by disasters and their options for responding. Poor people are generally at greater risk during natural disasters, and women are disproportionately represented among the poor." There needs to be increased awareness of this if disaster relief is going to adequately ensure the security of all populations.

There is some work being done to make the Indian state in particular aware of the unique security needs of women. Organizations like Women in Security, Conflict Management and Peace (WISCOMP) have the explicit goal of shifting the state's discourse on security. According to a member of the organization, one of their missions is to "[c]ontribute to an inclusive, people-oriented discourse on issues of security, which respects diversity and which foregrounds the perspectives of women and the hitherto marginalized" (Kakran and Sinha 2008). In 2006, WISCOMP held a forum on disasters and security. The forum report states that "[s]tructural inequalities of income and access to opportunity and political power determine vulnerability to natural disasters, because of poor housing, undiversified and fragile livelihoods and neglected civic amenities, among other things" (Rajagopalan and Parthib 2006: 3). Gender is said to be one dimension of these structural differences, as evidence by relief workers only recognizing male heads of households or impediments in transferring land title to female survivors. Groups like this are working on facilitating a dialogue with the state in order to shift the dominant view of "security" away from state security to a more encompassing conceptualization of security. As was mentioned above, one way to help ensure the security of

women is to use disasters as opportunities to empower women by having them involved in relief and rebuilding efforts (Enarson and Morrow 1998; Mishra et al 2004).

"Environment" is somewhat problematized in discussions of this case to mean the place where people live. The concern over the environmental issue of flooding leads to consideration of negative impacts on people's livelihoods. On the other hand, ecofeminists would likely take issue with the treatment of environment as something to mold to human use. The environment is often discussed as something for humans to "develop" (particularly in conversations about hydroelectric potential) and manipulate (as evidence in deliberations about building embankments to "jacket" rivers around human settlement). Additionally, ecofeminists will likely take issue with the scant attention given to discussions of the ecosystem in this case. Recognizing the close link between humans and the environment, ecofeminists would likely call on scholars and policymakers to include the health and security of the environment into their consideration of flooding to a much larger degree. As was mentioned in discussions of the *ecological security* discourse, there is talk about this scattered in scholarly writings and government documents, but there appears to be little policy action in this direction.

Another insight from feminist analysis is a critical examination of the proposed causes of insecurity that are linked to the environment. With flooding, population is discussed as contributing to the larger impact that floods have for the GBM inhabitants. This can have important gender implications. I found evidence of concern about the population of this region dating back many years. In a 1992 report distributed to the Indian government on environmental issues in India's Uttar Pradesh, the high population levels of the region were a

major concern. However, how this issue is addressed is vitally important for those concerned

with gender. One participant claimed

> In this region, the average fertility rate is very high and infant mortality rate is
> equally high while the nutrition status is low, literacy is low. The female
> literacy rate is very low. Various studies have shown a direct correlation
> between female literacy rate and fertility rate…The long-standing programme
> of family planning has met with little success in reducing the fertility rate.
> Recently, the Prime Minister observed that in these spheres of social
> engineering, governmental and non-governmental sectors have to work
> together to bring about attitudinal changes. If we do not do that and continue
> to grow at this rate then the health status of the people will go down, the
> economic status will go down. The rate of consumption of natural resources
> like land, water and forests will become unsustainable and, in the long run,
> will affect the social and economic development of the people. So all out
> efforts to stabilise population growth-rate is fundamental to all
> environmental conservation and socio-economic development activities.
> (Godrej 1992: 3)

The underlying logic of this statement echoes the storyline that population growth has negative

consequences both for the environment and humans that is found in both the *environmental*

conflict and *environmental security* discourses. What is particularly interesting, however, is the

connection made between female literacy rates and population growth. If concerns about

population were met with strategies for female advancement and support, then two sets of

concerns could be addressed simultaneously. The discouraging part is that many such strategies

are not as successful as they could be, as evidence by Godrej's comments.

Another benefit of incorporating feminist analysis into this case is the opportunity to

give attention to multiple sources of knowledge. In the case of flooding, many of the flood

management schemes have followed the logic of embankments and dams that began during

British colonialism and continued through Independence. Interviews with two environmental

NGOs in India showed me that there appears to be a lingering frustration with the aftermath of

many of these types of infrastructure projects (Bagchi 2008; Srinivasan 2008). There have been more and more calls to rethink this process in recent years. Some environmental NGOs in India in particular have argued that if the embankment route is not working, then go back to "traditional" methods of flood management from pre-British periods or try a combination of strategies. There is evidence of NGOs urging this in other areas. For example, the Centre for Science and Environment based in New Delhi has studied water collection methods consulting the particular knowledge of women. They have presented their findings to the Indian government in the hopes of changing the strategies undertaken to manage water issues in the country (Srinivasan 2008). This may help to empower women, as well as offer alternative water management techniques.

In addition to encouraging the incorporation of multiple sources of knowledge, we may also entertain the rejection of some dominant societal structures. This argues for examining the issue of development critically, particularly examining choices and priorities made in the pursuit of development. According to Bangladesh's National Water Policy, flood prevention elements must take into account economic viability.

> Regions of economic importance such as metropolitan areas, sea and air ports, and export processing zones will be fully protected against floods as a matter of first priority. Other critical areas such as district and upazila towns, important commercial centers, and places of historical importance will be gradually provided reasonable degree of protection against flood. In the remaining rural areas, with the exception of those already covered by existing flood control infrastructure, the people will be motivated to develop different flood proofing measures such as raising of platform for homesteads, market places, educational institutions, community centers, etc., and adjusting the cropping pattern to suit the flood regime. (Ministry of Water Resources 1999)

This shows that the state has chosen to focus on elements that are "economically important" as a first priority. There is little mention of protecting those populations who are the most

vulnerable to flooding as a first priority. This suggests that economic considerations, consistent with state development goals, take precedence over ensuring human security.

The strongest theme in the discussions of this case appears to be the consequences of altering the environment, even for positive intentions. Hildyard (1999: 14-15) argues

> Undoubtedly 'natural' events such as floods and droughts play a part in creating hunger and malnutrition: so too does the ecological degradation that results when people are crowded onto marginal lands. But, in an age of human-induced climate change and of projects that divert whole river systems, neither droughts nor floods can be viewed as entirely 'natural' events. Similarly, the forces that crowd people onto marginal lands cannot be separated from policies and practices that daily generate scarcity for poorer people by denying them control over land, inputs, markets and decision-making.

There has been a long history of seeking technological fixes for environmental problems in the basin (Zaman 1993). In the aftermath of particularly disastrous floods in 1987 and 1988 in Bangladesh, a series of reports were commissioned to study how such devastation to life and property could be avoided. Most of the recommendations revolved around constructing large water management projects, like embankments and dams (Brammer 1990; Zaman 1993). Alternative options like learning to live with flooding as a part of a normal cycle were marginalized. Even the small-scale flood management strategies appear to have been aimed more at irrigation and maintaining agricultural output in the dry season. The plans were immediately criticized by scholars and NGOs in Bangladesh and around the world for economic, social and environmental reasons (Custers 1993; Pearce 1994). This demonstrates that certain choices have been made over time regarding how to "develop" water resources.

Conclusions

In this chapter, I have used the ideas of security and environment discourses and gender in order to better understand the case of flooding in the GBM water basin. By using discourse analysis to analyze academic and policy discussions on flooding in the GBM basin, I was able to demonstrate that the *environmental security* discourse is currently the most prevalent for discussing this case. The *environmental conflict* and *ecological security* discourses were marginal to the case. Additionally, I found that gender is not present in these discussions to the level that I originally expected. There is some discussion of the different ways that men and women experience disasters, however there is a larger role for gender analysis in flooding discussions. By using insight from various feminisms there are several contributions that the inclusion of gender can make to discussions of this case, including examining issues of justice and vulnerability, problematizing the central elements of discussion, incorporating multiple sources of knowledge, and questioning dominant discourses on development.

A great concern for a case like this is what flooding in the basin is likely to look like in the future. The issue of climate change bears strong importance to answer these questions. The government in Bangladesh in particular has come out very strongly in climate change discussions claiming that Bangladesh is "on the threshold of a climatic Armageddon" (Vidal 2008: 1). Additionally, Indian environmental NGOs have started looking into the possibility of worsening floods in the event of increased glacier melting (Bhatta 2007). This increased sense of urgency makes it even more imperative that gender concerns are incorporated into discussions of this case. If flood events worsen in the region, then the unique security needs of

both women and men must be kept in mind. Also, we may have to consider a rethinking of how we define security and handle environmental problems. Women's organizations and environmental organizations in India in particular have started the work on this path and hopefully other basin states will follow suit.

Chapter 6 - Impacts of Agriculture on the Ganges-Brahmaputra-Meghna Basin

The Ganges and Brahmaputra basins in Bangladesh, India, and Nepal are among the most populous areas of the world. It is estimated that some 450 million people, or 9.6 percent of all mankind, occupy the 100 million acres of croplands in these basins. These people are among the poorest in the world, many of them earning not more than US$150 in a year. The vast majority relies on agriculture for their livelihood. Yet the area is, in a way, the subject of a success story, its people having contributed greatly towards the achievement of the green revolution in South Asia (A.H. Shibusawa 1987: 319).

This chapter explores the impacts of agricultural practices for the GBM basin, including its impacts on water and soil in the region. Like the previous two chapters, it will begin with a background discussion of the case of agricultural practices in this region. I then move on to discourse analysis of the case, in which I identify whether and how each of the security and environment discourses appear in discussions of the case. Next, I conduct gender analysis of the case in order to trace the presence and absence of gender in discussions of agricultural practices. Finally, I conclude with a discussion of the future of this case, particularly in light of the recent calls for agricultural reform and a second Green Revolution in Africa.

Agricultural practices can have a variety of impacts on the environment. These include the consequences of fertilizer use, pesticide use, irrigation of cropland, etc. (Tilman 1999). The Millennium Ecosystem Assessment (2005: 6) states that agricultural systems and practices have exerted a wide range of impacts, many of them adverse, on ecosystems globally. "Both the extensive use of water for irrigation (some 70% of water use globally is for irrigation) and excessive nutrient loading associated with the use of nitrogen and phosphorus in fertilizers have resulted in a decline in the delivery of services such as fresh water and some fish species." The rivers of the GBM basin are heavily impacted by agricultural practices. For the Ganges alone,

it is estimated that run-off from 6 million tons of fertilizers and 9000 tons of pesticides used in agriculture end up in the river every year (Sankararamakrishnan et al 2005). Most applied pesticides do not remain at their target site but often enter aquatic environments "via soil percolation, air drift or surface runoff affecting abundance and diversity of non-target species producing complex effects on the ecosystems and altering tropic interactions. In addition, many pesticides eventually end up in ground water and their transformation products may remain for years" (Sankararamakrishnan et al 2005: 116).

One area that has received attention is the environmental impact of irrigation water. Irrigation is typically undertaken in order to increase the production of food from both yield size and agricultural area. Biswas (2001: 2) explains

> Efficient irrigated agriculture is essential for ensuring reliable food production in the twenty-first century. At present nearly 55 per cent of all rice and wheat produced in the world comes from irrigated areas and some 2.4 billion people currently depend on irrigated agriculture for food, income, and employment. Current estimates indicate that 80 per cent of the additional food supplies required to feed the future world population will depend on irrigation.

There has been extensive irrigation pumping in the GBM basin. Croplands are irrigated with both surface and groundwater (Polizzotto et al 2008). It is estimated that agriculture accounts for around one-half of all freshwater usage in the basin region (Elhance 1999).

One phenomenon that had a huge impact on agricultural practices and policies in the region was the implementation of technologies during the Green Revolution. The Green Revolution took place in countries around the world largely between the 1960s and 1980s.[56]

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[56] In actuality, Green Revolution technologies were implemented in Mexico first and later in Asia. The Mexican Agricultural Program was started in 1943 (Busch 2000).

The brainchild of many in the West[57], it led to the introduction of technological advancements in agricultural practices. These included the development of high-yielding varieties of food grains, land consolidation, private tubewell irrigation, mechanization, and the use of fertilizers and pesticides. The main motivation behind implementing the Green Revolution in Asia was a sense of urgency to feed its people. Much of the policy discussions on the Green Revolution centers on its implementation in India in particular.[58] In 1942-1943, the Indian subcontinent witnessed a severe famine in Bengal, resulting in the death of nearly three million people. This prompted Jawaharlal Nehru, the first Prime Minister of independent India, to remark in 1948, "everything else can wait, but not agriculture." Shifts in agricultural policies included land reform, expansion of irrigation facilities, and greater support for research on seeds and fertilizers (Swaminathan 2006). When Green Revolution measures were implemented in the 1960s, India was also driven by a desire for self-reliance in food production as a newly independent state (Brooks 2005).

The Green Revolution was considered a huge success for many years after its implementation. Writing in 1987, Shibusawa described the Green Revolution thusly

> This success story in agriculture is due mainly to major improvements in agricultural practices, including increased use of both surface and ground water and better water management, improved varieties of food grains, and a greater application of commercial fertilizers. Yet, considering the general poverty level of the area, coupled with a high rate of population increase, reaching about 3 percent per annum in some parts of the area, more efforts in improving agricultural practices are urgently needed, most important of which include additional water resources, better water management methods, and improved agricultural services (319).

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[57] Most credit Norman Borlaug, an American botanist, with developing the grain technologies necessary to implement the Green Revolution. He won a Nobel Peace Prize in 1970 for his efforts (Easterbrook 1997).
[58] For an example of the impacts of the Green Revolution on Bangladesh, see Alauddin and Tisdell (1991).

The measures were deemed a success largely due to the increase in agricultural yields experienced after their implementation. Over time, however, there has been mounting criticism of the Green Revolution on social and environmental grounds. The International Assessment of Agricultural Science and Technology for Development (IAASTD) was created in 2002 by a collection of international development agencies to review agricultural policies of the last few decades, including the Green Revolution. According to the group's 2008 report, they recognize that "despite significant scientific and technological achievements in our ability to increase agricultural productivity, we have been less attentive to some of the unintended social and ecological consequences of our achievements" (IAASTD 2009).

Despite the list of concerns about the Green Revolution technologies on social and environmental grounds, these agricultural reforms had a profound impact on the way that agriculture is viewed in this part of the world. For example, Bangladesh's National Agriculture Policy still emphasizes the importance of improved seed varieties, targeted irrigation, and the use of fertilizers for agriculture (Ministry of Agriculture 1999). These are all elements that were stressed during the Green Revolution. Additionally, there has recently been a flurry of journal and newspaper articles calling for a series of agricultural reforms, or a new Green Revolution, particularly in Africa. Falkenmark and Röckstrom (2006: 129) claim that "[a]ddressing the millennium development goal (MDG) of halving the proportion of malnourished people in the world by 2015...is thus not only a tremendous agricultural endeavor but is also the world's largest water-resource challenge. Hunger alleviation will require no less than a new Green revolution during the next 30 years, particularly in sub-Saharan Africa." In the past few years Bill Gates has launched the Alliance for a Green Revolution in Africa (AGRA), headed by Kofi

Annan, to develop high-yielding seeds to be grown in Africa (Gillis 2007). Annan (2008: 20) has claimed that an "African Green Revolution that doubles or triples the productivity of smallholder farmers, preserves our biodiversity, and creates rural income will be crucial in ending widespread poverty and hunger, and freeing Africa from its dependency on food imports and food aid." These claims have been echoed by internationally known development voices like Jeffrey Sachs (2008).

This case examines agricultural practices in the GBM basin, including the implementation of the Green Revolution and its consequences. There were direct links between the Green Revolution and the GBM basin, including the production of wheat and rice in basin states of India (Sharma 1999). The first phase of the Green Revolution (from 1962-65 to 1970-73) centered on wheat production and the main beneficiaries were the irrigated states of Punjab, Haryana, and western Uttar Pradesh in India. Later phases included a focus on rice and extended the regions where technologies were implemented (Bhalla and Singh 2001). It is true that the central focus of the Green Revolution went beyond the GBM basin, however, like most other environmental issues, there are spillover effects far beyond the confines of the initial target areas. Rather than this being a case that is strictly confined to water issues, an examination of agricultural practices brings in elements of food security as well, something that demonstrates a wider applicability to understanding security and environment discourses.

Security and Environment Discourses on Agriculture in the Ganges-Brahmaputra-Meghna Basin

The previous two case chapters demonstrated that there is a great deal of variation in how security and environment discourses manifest in discussions of environmental issues. The policy discussions on agriculture in the GBM basin were in line with my starting predictions about this case. I thought that because of the recent attention to the social and environmental impacts of agriculture, and to the Green Revolution in particular, there would be a large role for the *environmental security* and *ecological security* discourses in discussions of this case. This is largely what occurred, although the *environmental security* discourse was the most central. In addition to these discourses, there were occasional uses of the *environmental conflict* discourse as well.

Environmental Conflict Discourse

The key storyline in the *environmental conflict* discourse is conflict over scarce resources. One area where we can see evidence of this storyline is in discussions of the motivation to promote Green Revolution policies. This case demonstrates that avoiding conflict over food was a motivation for applying Green Revolution measures. It was largely conceived as a way to avoid sub-state conflict rather than conflict between basin states. In 1969, Wharton wrote

> The quiet, passive peasant is already aware of the modern world—far more than we realize—and he is impatient to gain his share. The Green Revolution offers him the dramatic possibility of achieving his goal through peaceful means. It has burst with such suddenness that it has caught many unawares. Now is the time to place it in its long-range perspective and to engage in contingency planning so that we may respond flexibly and quickly as the

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> Revolution proceeds. Perhaps in this way we can ensure that what we are providing becomes a cornucopia, not a Pandora's box (476).

From this statement, we can see that the Green Revolution was conceived as a way to avoid conflict in agricultural communities (Busch 2000; Shiva 1991).

An additional interesting take on the environmental conflict discourse is the role of the Green Revolution in the Cold War. It has been argued that the US conceived of the Green Revolution as a way to increase prosperity and reduce hunger in developing countries, thus making it less likely that they would turn to communism (Busch 2000; Hindmarsh 2003; Perkins 1997). Spitz (1987: 56) claims that "'Green', of course, was implicitly opposed to 'red', and was signaling, like a flag, that social reform was not necessary, since technical means in agriculture (evoked by 'green') alone were supposed to solve the problem of hunger." This implies that Western states viewed agricultural advances, or the environment, as a way to ensure the security of their block. This illustrates the so-called "Population-National Security Theory." The theory said that poverty and discontent were linked to population growth.

> This, in turn, led to discontent and political instability. The instability could be and was used by the communists to provoke revolutions. The solution to the problem lay in increasing agricultural productivity so as to permit widespread industrialization and a prosperous agriculture at the same time as fertility decline would be encouraged through dissemination of birth control methods and devices. Birth rates would decline, poverty would cease to be a major problem, and communists would have little support. (Busch 2000: 61)

This theory understood agriculture as a means of enabling security from the communist threat. It also includes another *environmental conflict* storyline- population growth leading to instability for the state. The chosen response to these threats was to increase food yields through the implementation of Green Revolution technologies. While these sources do not explicitly mention the GBM basin, the fact that Green Revolution policies were implemented in

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states of the basin demonstrates that this was a region expected to aid in the goals of avoiding

conflict and ensuring state instability.

Environmental Security Discourse

The *environmental security* discourse is used throughout the discussions of this case.

Storylines include concern about food security, using the environment to ensure human

security, unintended human security impacts of changing the environment, and the role of

population growth in creating environmental insecurity. The main goal of agricultural policies in

the GBM basin, including the Green Revolution, has been to increase the production of food for

the population. Several sub-national states in India situated in the GBM basin directly

contribute to food security through the production of rice, wheat, and maize. According to a

2006-2007 report by the Ministry of Agriculture, basin states like Bihar, Uttar Pradesh, and

West Bengal are some of the key regions for the production of these crops (Ministry of

Agriculture 2007b). Crop availability and food security have been a central concern in the basin

for years. In the years leading up to the implementation of Green Revolution policies, there

were severe food shortages in many parts of the world, including Asia, and food security was a

central concern for many governments and development organizations. The Green Revolution

was viewed as a way to ensure that populations had enough to eat. And there is evidence that

there was a marked increased in the yields achieved by farmers who implemented Green

Revolution technologies. According to Bhalla and Singh (2001: 23) "[o]ne of the most important

impacts of the new technology was to bring about significant changes in yield levels of major

cereals namely wheat and rice and of some other crops in many regions of India." As a result of

this, yield rather than area growth became the predominant source of growth in Indian agriculture.[59] India's total cereal production increased from around 74 million metric tons in the 1960s, to around 100 million metric tons in the 1980s and around 134 million metric tons in the 1990s (Larson et al 2004). GBM states contributed to these figures through wheat and rice production in particular. Additionally, regions of Bangladesh that implemented Green Revolution technologies, including GBM regions, saw increases in food yields (Ali 1995).

Despite this concern for food security, many scholars have pointed out that Green Revolution techniques did not achieve as much as was originally expected. While it is true that countries that implemented Green Revolution technologies avoided the realization of Malthusian predictions, the food security strategy proved unable to maintain yield increases. Kesavan and Swaminathan (2008) explain that since around the mid-1980s, there have been signs of degradation of soil quality, and yields have been stagnating. Manning (2000) argues that there is now generally a consensus that the technologies used in the Green Revolution will not be able to sustain food security into the future. Production is leveling off while the population continues to grow. This means that food security was met for much of the population in the short term, but not the long term.

Another element of the *environmental security* discourse seen in discussions of this case is the population growth storyline. It is often argued that population growth rates in the region mean that agricultural practices cannot sustain the food security of everyone. Writing in 1991, Alauddin and Tisdell raised attention to potential future problems of food security due to population pressure in Bangladesh. In fact, many have attributed India's recent food security

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[59] Bangladesh also saw an increase in the productivity of already cultivated land after the implementation of Green Revolution technologies (Alauddin and Tisdell 1991).

issues to its increasing population. "India raised a red flag two years ago about how heavily the appetites of its 1.1 billion people would weigh on world food prices. For the first time in many years, India had to import wheat for its grain stockpile. In two years it bought about 7 million tons" (Sengupta 2008). This has raised concerns about food security both in terms of the total availability of food, and the costs of food, which if are too high prohibits large sections of society from maintaining food security. The GBM basin factors into these debates due to its status as a region with relatively high population growth, and its status as a region with a high degree of agricultural activity (Samarakoon 2004). The basin region plays an interesting role in both constraining food security, through high population numbers, and achieving food security through crop production.

Another *environmental security* storyline evident in this case is altering the environment to enhance human security, namely food security, sometimes with unintended consequences. A visible example of this is the series of agricultural shifts undertaken as part of the Green Revolution. This included changing seed varieties to high yielding varieties (HYVs) and making extensive use of fertilizers and pesticides in order to increase the crop production of the region. According to Hindmarsh (2003), Indian consumption of fertilizers increased from 5.5 million tons in 1980-81 to 13.5 million tons in 1992. Some have expressed concern that this use of fertilizers, pesticides, and particular types of seeds reduces the independence that some farmers have for their own food security. According to Mahendra Singh Tikait, farmer and leader of the Bharatiya Kisan Union

> ...the Green Revolution has robbed us of our traditional farming methods. We
> have lost our rights to preserve seeds and are at the mercy of seed and
> pesticide companies. This government is for the wealthy and the powerful.
> Foreign companies have a well-laid trap to snare us. We can't use seeds for

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more than a season. We have lost our traditional eating habits. Seed and pesticide companies are raking profits but the farmer has nothing: hardly any education, no food security and barely any access to health facilities (Misra et al 2008: 30).

While this view cannot be generalized to the entire farming population of the basin region, it is telling that a spokesperson for a large farming union has publicly reacted to the Green Revolution in this way quite recently. It seems to indicate that the Green Revolution set into motion a system of agricultural policies that are still being felt today, for better or worse.

The environment has also been altered in order to make way for irrigation projects. Many have argued that water supply for irrigation is perhaps the most serious constraint on agricultural development in the basin region (Shibusawa 1987). It is argued that the Green Revolution could only have taken place after farmers could supplement irrigation supplies with tubewells (Chaturvedi 2001). For example, irrigation measures were implemented in the Indian state of Bihar, a GBM basin state, after a severe drought and famine in 1966-67. The government drilled state tubewells as well as gave subsidies to farmers who wanted their own well on their land (Nair 1979).[60] Once again, this is evidence of the government's motivation to alter the environment in order to ensure food security. And while Conway (1998) claims that wells are not as harmful as reservoirs, he does acknowledge that they can damage the water supply. Shiva (1991: 125) says that "[t]he Green Revolution increased the need for irrigation water at two levels. Firstly, the shift from water prudent crops such as millets and oilseeds to monocultures and multicropping such as wheat and rice increased the demand for water inputs throughout the year...Secondly, the replacement of old varieties of wheat with new varieties of

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[60] Nair (1979) points out that although these government-led irrigation schemes were undertaken in Bihar, a GBM basin state, irrigated land accounted for much more of the total land in other states like Punjab.

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wheat and rice also increased the intensity of irrigation, which went up from 20-30% to 200-300%." The absence of irrigation water availability is felt today. A 2007 report put out by India's Ministry of Agriculture recognizes that irrigation water is not available in the quantities needed by much of the farming community (Ministry of Agriculture 2007a).

The government of Bangladesh set a target for the production of 25 million tons of food grain per year by the year 2010 in order to keep pace with population growth rates. This can only be achieved if the GBM basin region can raise production through expanded irrigation. Most of this irrigation has come in the form of groundwater irrigation projects. "In the absence of a sizeable surface irrigation programme, groundwater irrigation has grown very rapidly in the [Ganges dependent areas] of Bangladesh" (Huda 2001: 50). This groundwater irrigation has a number of impacts, the most important of which may be that it is not likely to be sustainable in the long term. Huda (2001: 50) explains that the "expansion of groundwater use entails the lowering of groundwater tables, which affects domestic supply wells, the sustainability of ponds, and, in the long term, equity and social equilibrium amongst user groups."

A related storyline is to use improved agriculture to help alleviate poverty and thus help to ensure human security. According to the National Agriculture Policy of Bangladesh, a particular goal of agriculture in the country is to "[e]nsure a profitable and sustainable agricultural production system and raise the purchasing power by increasing real income of the farmers" (Ministry of Agriculture 2009). Baker and Jewitt (2007) examine the experiences of villages in the Bulandshahr District of western Uttar Pradesh, a region within the GBM basin, and find that there has been increased food security and financial security in many instances. The villagers themselves attribute most of these benefits to the Green Revolution. They note

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that there were increases in labor opportunities and that they did not experience a food crisis. They link village electrification in the 1980s, something with wide-ranging advantages, to irrigation schemes. Despite this, the benefits were still unequal. Baker and Jewitt argue that while in many cases the poorest are better off, the gap between rich and poor is now greater than ever.[61] This means that while there have been several documented benefits from agricultural policies, they are not equally distributed.

One unintended side-effect of agricultural policies is to threaten human security through other means. Some human security threats tied to agricultural practices that have gained attention over the years are arsenic contamination in water and health consequences of pesticides. Several scholars explain that high levels of arsenic in groundwater have been found in several areas of the GBM basin- including regions of India, Bangladesh and Nepal (see Appendix B for a map of this phenomenon) (Brammer and Ravenscroft 2009; Chakraborti et al 2003; Das et al 2008) . Some scholars point to agricultural practices as worsening the problem of arsenic contamination (Hossain 2006).[62] "In particular, groundwater pumping for irrigation, changes in agricultural practices, sediment excavation, levee construction and upstream dam installations will alter the hydraulic regime and/or arsenic source material and, by extension, influence groundwater arsenic concentrations" (Polizzotto et al 2008: 505). This can cause health problems if water with high arsenic concentration is used for domestic water supplies. These health impacts include skin lesions, gangrene, skin cancer, internal cancers (bladder

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[61] One reason behind this is that irrigation water is more expensive for the poor than for the rich. "Tube well water is more expensive than canal water in spite of the subsidy on electricity and this is a major burden for smaller farmers, especially where their land is distant from canals and where they have no option but to depend on tube well water for irrigation" (Baker and Jewitt 2007: 328-329).

[62] Hossain (2006) argues that there is a possible link between agricultural practices and increased arsenic contamination, however more research is needed to better understand these connections.

cancer, lung cancer, liver cancer, etc.), and adverse pregnancy outcomes (Das et al 2008). Arsenic contamination can also cause problems with food grown with these water supplies. "[I]t has recently become apparent that arsenic-polluted water used for irrigation is adding sufficient arsenic to soils and rice to pose serious threats to sustainable agricultural production in those countries and to the health and livelihoods of affected people" (Brammer and Ravenscroft 2009: 647). The potential that arsenic is reaching rice crops is particularly important given the central place for rice in diets of this region.

Another threat to human security tied to agricultural practices is the health impact of pesticide use. In an early assessment of the Green Revolution, Glaeser (1987) says that "[e]xcessive amounts of pesticides, applied irresponsibly over large areas, created health hazards for rural inhabitants." These adverse effects of pesticides continue to the present as the use of pesticides is still significant in the region. These negative conditions stem from the result of misapplication, careless storage, and improper disposal of unused pesticides and containers (Hussain and Asi 2008). Rekha and Prasad (2006) found that human health hazards from the misapplication of pesticides range from moderate (mild headaches, flu, skin rashes, blurred vision and other neurological disorders) to severe (paralysis, blindness, death). In some cases, pesticides and fertilizers that had been banned in Northern states were still being used in Southern states as part of the Green Revolution policies. For the most part, these substances were banned in the North due to their negative impacts on human health (Conway and Barbier 1990).

A final *environmental security* storyline seen in this case is environmental peacemaking. Several authors have argued that the goal of achieving food security in the basin can only be

met through the cooperation of the basin states. In order for Bangladesh to meet the food

needs of its people, it will likely have to build large irrigation mechanisms in order to expand

the amount of irrigated agriculture in the basin region. "Preliminary studies have indicated that

this can be done by diversion of Ganges water during the dry season by constructing a barrage

on the Ganges. Undertaking such a large project needs the active support and cooperation of

India as an upper riparian" (Huda 2001: 50). This suggests that India and Bangladesh must

cooperate on water sharing if the food needs of Bangladesh as the lower riparian state are to

be met. Irrigation is briefly mentioned as one use of shared water that must be protected in the

1996 water sharing treaty between India and Bangladesh.

Ecological Security Discourse

The central storyline of the *ecological security* discourse is the negative impact of

human behaviors for the environment. One place that this storyline is evident is in discussions

of the negative impacts of agricultural practices for the environment. These discussions include

the recent critiques of the agricultural shifts undertaken with the Green Revolution on

environmental grounds.[63] Conway (1998: 86) explains that "[i]n the 1960s, when the Green

Revolution was beginning to make its impact, little thought was given to environmental

consequences. They were deemed either insignificant or, at least, capable of being easily

redressed at a future date, once the main task of feeding the world was accomplished. There

was also a strongly held view, one still commonly voiced, that a healthy, productive agriculture

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[63] While the environmental consequences of the Green Revolution have been the subject of much debate in recent years, Swaminathan sounded the alarm on this possibility as far back as 1968 when he urged caution against exploitative agriculture and unchecked population growth (Kesavan and Swaminathan 2008).

would necessarily benefit the environment." Likewise, Kesavan and Swaminathan (2008: 877) claim that "intensive agriculture practiced without adherence to the scientific principles and ecological aspects has led to loss of soil health, and depletion of freshwater resources and agrobiodiversity." Similarly, Shiva (1991: 15) says that "[t]he reduction in availability of fertile land and genetic diversity of crops as a result of the Green Revolution practices indicates that at the ecological level, the Green Revolution produced scarcity, not abundance." These claims suggest that the Green Revolution was undertaken without considering the needs of the environment itself, which has led to a decrease in ecological security.

Increased irrigation of cropland, and increased use of pesticides and fertilizers are a few elements of agricultural practices that have been particularly criticized on environmental grounds. While fertilizers were used before the implementation of the Green Revolution, their use rose dramatically with the spread of the Green Revolution. Half of all of the synthetic nitrogen fertilizer ever used on Earth has been produced since 1985 (Howarth 2008). This intensive fertilization resulted in nitration, which caused eutrophication of freshwater streams and lakes (Glaeser 1987). Eutrophication causes water bodies to receive excess nutrients that stimulate excessive plant growth. This enhanced plant growth, reduces dissolved oxygen in the water when dead plant material decomposes and can cause other organisms to die (Howarth 2008). This can lead to a loss of biodiversity in aquatic ecosystems. Tilman (1999: 5995) explains

> Aquatic nutrient eutrophication can lead to loss of biodiversity, outbreaks of nuisance species, shifts in the structure of food chains, and impairment of fisheries. Because of aerial redistribution of various forms of nitrogen, agricultural intensification also would eutrophy many natural terrestrial ecosystems and contribute to atmospheric accumulation of greenhouse gases. These detrimental environmental impacts of agriculture can be minimized only if there is much more efficient use and recycling of nitrogen and phosphorus in agroecosystems.

It is often the case that links are made between environmental damage and agricultural practices, but with the ultimate goal of fixing the problem in order to benefit agriculture in the future. This is a case of an argument looking like an *ecological security* argument, but actually reflecting the *environmental security* discourse. The key difference is whether the scholar or policymaker is ultimately concerned with the security of the environment for its own sake, or for human populations. For example, some of the negative impacts of increased irrigation include waterlogging and salinity (Busch 2000; Shiva 1991).[64] While these are problematic for the environment, they also negatively impact farmers' ability to grow crops. If the main focus is on future agricultural potential of soils, then this cannot be termed an *ecological security* discourse.

There have recently been more and more calls to take the needs and health of the environment into account directly. M.S. Swaminathan, a figure who was heavily involved in the Green Revolution in India, has called for an "evergreen revolution." "Both soil restoration and enhancement, and water conservation and sustainable use are important for launching an Evergreen Revolution movement. It would be useful to consider recent advances in the improvement of wheat and rice to examine what midcourse corrections are needed for the purpose of adding the environmental dimension to productivity improvement" (Swaminathan 2006: 2294). This is similar to the perspective of Conway (1998: 41) who calls for a "Doubly Green Revolution" or "a revolution that is even more productive than the first Green Revolution

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[64] Soil salinity stems from dissolved salts in surface and groundwater used for irrigation that gets left behind when irrigation water evaporates (Pimentel et al 1997; Singh 2005). Salinization is a general concern of agricultural irrigation worldwide, and the Green Revolution increased the concern by increasing irrigation. These issues are acknowledged by India's 2002 National Water Policy, which states "[p]roblems of water logging and soil salinity have emerged in some irrigation commands, leading to the degradation of agricultural land" (Government of India 2002).

and even more 'green' in terms of conserving natural resources and the environment."

However, the most common storyline is that we have to fix the ecological elements so that we

can achieve food security. "The most important among the internal threats is the damage to

the ecological foundations (i.e., land, water, forests, and biodiversity) essential for sustaining

agricultural advancements" (Swaminathan 2006: 2301). This suggests that while there are calls

to pay attention to *ecological security,* it is largely conceived as a way to ensure *environmental*

security.

I expected to see the *environmental security* to the largest degree in the discussions of

this case. This was my starting assumption largely due to the issue of food security and the ties

between food security and human security. This is mainly what happened, with additional

observations of the *environmental conflict* and *ecological security* discourses. In some

instances, agricultural practices are presented as an example of the tradeoffs between

environmental security and ecological security- between food security and protecting the

environment (Falkenmark and Röckstrom 2006). In reality, there are typically a combination of

concerns lumped together. For example Conway (1998: 38) argues that major investment in

agriculture and natural resources, like the Green Revolution can

> 1) Create employment and incomes for the mass of the poor; 2) Deliver food
> security; 3) Help to reduce birth rates through increased food and income
> security; 4) Protect and conserve the environment; 5) Stimulate development
> in the rest of the economy; 6) Ensure prosperity in the industrial world through
> the stimulation of global trade; and 7) Increase the likelihood of political
> stability.

This one statement combines storylines from all three of the security and environment

discourses, plus gender concerns.

Gender and Agricultural Practices in the Ganges-Brahmaputra-Meghna Basin

Gender concerns are evident in this case in specific language recognizing the central place of women in agriculture. The position of women is briefly discussed in Bangladesh's 1999 National Agricultural Policy. The document says "[i]n the socio-economic context of Bangladesh, involvement of women in agriculture is very important. It would be easier to control rural-urban migration by engaging women in agricultural activities to a greater extent" (Ministry of Agriculture 1999: 19). One measure put forth to achieve this goal is to undertake a research program "to identify constraints with regard to women's participation in agricultural activities and measures will be taken to remove those identified constraints" (20).

We can also see gender concerns in critiques of agricultural practices for disempowering women. Social scientists stressed that often women were excluded from technology-based agriculture, like that advocated by the Green Revolution, leading to their marginalization. Brandon (2008: 26) says that the Green Revolution reduced the power of women in several ways. "Increased reliance on industrial fertilizers and pesticides replaced women's specialized agricultural knowledge, while the spread of intensive monocultures left fewer margins in which forage could be successfully carried out. Frequently barred from formal education and access to property ownership, women became even more disadvantaged once the monetary economy rose to penultimate importance." Likewise, Conway (1998) explains that while the higher production and cropping intensity of the early Green Revolution increased the demand for women's labor, they were often subsequently be displaced by mechanization.

There is also discussion of some of the gendered impacts of agricultural practices in terms of remaining food insecurity. Conway (2007: 163) argues that the initial higher production of food from the Green Revolution helped to reduce food prices by over 70 percent, which benefited the poor, who spend the highest proportion of their income on food. "Yet today there are still some 800 million people who live a life of permanent or intermittent hunger and chronic undernourishment. A high percentage of the hungry are women and children; more than 150 million children under 5 years of age are severely underweight." This relates to the unique security needs of many women, namely food security needs. As food security again becomes an issue in Asia, it is likely to be women and children who suffer most, and first. This is particularly true of the GBM basin, which has extreme poverty levels (Shah 2001).

Examining gender gives us the tools to critically examine the choices made with regard to agricultural policies. Critical approaches in general encourage us to ask questions like "who did Green Revolution policies benefit" and "were there alternatives to these policies." The Green Revolution did not just happen by accident, but rather governments enacted specific policies that were in line with the dominant development ideologies of the day.[65] We can also examine the gender implications of these types of policies. Manning (2000) explains that one side-effect of the Green Revolution was to displace rural people through mechanization and large-scale, capital-intensive farms. Most of these displaced people were poor, subsistence farmers. Sharma (1999: 159) explores this through an examination of not only class, but caste in

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[65] There has also been extensive writing on intrastate and interregional imbalances of Green Revolution implementation by the state of India (Sharma 1999). Some states benefited more than others from investment and programs associated with the Green Revolution.

Vikaspur, a village in the GBM region of western Uttar Pradesh. "However, the vast majority of the poor shudras (or 'backward castes') and the 'scheduled caste' groups (i.e., smallholders, sharecroppers, and the landless) did not benefit from land reforms or the fruits of the green revolution strategy." This suggests that the most marginalized in society, both in terms of class and caste, were often the last to see the benefits from Green Revolution strategies. Likewise, the Green Revolution has been criticized for favoring large landholders with Western ties. Small landowners were not subsidized by governments and they often gave up their farms because they could not compete (Glaeser 1987; Sharma 1999). In this respect, these farmers lost their livelihood security.[66] Many of these small farmers who lost their farms ended up moving to cities where they no longer looked out for their own food security (Busch 2000; Kesavan and Swaminathan 2008).

It is argued that the shift from farming life to city life is said to have distinct impacts for women, particularly with regard to employment. In scenarios where only the men leave the farm to pursue work in cities, women are left to head households with diminished livelihood opportunities (Kesavan and Swaminathan 2008). Alternatively, if women and men leave the farm to pursue work in cities, there are gender differences in employment opportunities. Busch (2000: 63) claims that "[w]hat few jobs existed went to men. When women were employed they were often paid less than their male counterparts. Similarly, many farmworkers lost their jobs, especially as weed control was shifted from labor to herbicides." Even those who were able to stay on farms and found themselves wealthier, remained dependent on the suppliers of

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[66] Lowell Hardin (2008: 471), an attendee at the 1969 conference of development personnel on the Green Revolution, claims that these economic concerns were realized even before the Green Revolution was implemented. "We worried that a widespread green revolution could have unintended consequences, such as aggravating the inequalities between small farmers and large landowners...However, we concluded that world food needs outweighed such potential difficulties."

inputs- seeds, machinery, chemicals, water- that were necessary to ensure the higher yields of the new varieties. This made their human security situation highly dependent on others.

While there are a few mentions of gender in discussions of agricultural practices in the GBM region, there is space for a more substantial inclusion of gender concerns in this case. Each of the elements above, the disempowering of women through Green Revolution technologies, the future impact of food insecurity on women, and labor impacts on women, were discussed after the Green Revolution was already implemented. There is little to suggest that these concerns were given serious consideration while the Green Revolution was under consideration. With this in mind, using a feminist lens in order to explore gender in this case is even more important given all of the recent calls to implement an African Green Revolution. If gender concerns were not given much consideration in the first Green Revolution, then it is important to understand them now before their absence causes problems in another region.

One contribution that incorporating gender brings into discussions of this case is to examine the power dynamics of agricultural practices and policies. Writing in 1999, Elhance identifies power dynamics in the form of influential agricultural lobbies to the Indian government. The claims that these lobbies "have developed a vested interest in ensuring a continuation of their water rights as well as the huge subsidies they receive for irrigation water and electric power" (168). This shows that some portions of society have been able to disproportionately benefit from agricultural policies, namely those who are able to form connections with the central government. Another unintended consequence of agricultural practices that has been debated is the impact of the introduction of new technologies on small farmers and their food security. Many studies claim that Green Revolution policies tended to

disproportionately benefit large-landowners, at the expensive of the most marginalized groups. Sharma (1999: 150) explains that "by ensuring substantial price and procurement supports for farm commodities and channeling scarce technological inputs (at subsidized prices), as well as government-funded loans and credits at concessional rates, to powerful economic and political interests in the countryside, such policies were decisive in reinforcing and exacerbating rural socioeconomic disparities." Similarly, Hildyard (1999: 16) claims that states impacted the process by how they chose to define the problem. "By defining rural poverty in terms of insufficient productivity (solution: high-yielding crop varieties and agrochemicals) rather than a lack of access to sufficient land (solution: agrarian reform), some governments, in alliance with richer farmers and international development agencies, used 'land reform' to appropriate land for the Green Revolution instead of freeing it up for peasant agriculture."

The Green Revolution was conceived of in the West and its implementation in developing countries was supported by Western donor states. In particular, the Rockefeller Foundation was key to spreading the ideology of the Green Revolution to Southern states. Together with the Ford Foundation and other Western agencies, the Rockefeller Foundation created the Consultative Group on International Agricultural Research (CGIAR) in 1971 to coordinate the network of international agricultural research centers (Hindmarsh 2003). While their motivations for getting involved in food policy in Southern states was surely laudable, their activities fit into a larger model of development theory in general, where development was thought to be linear and modeled after the experience of Northern states. Spitz (1987) argues that the Green Revolution was based on the expectation that what works in the North

should work in the South. The powerful in the international community had a large role in advising Southern states on how to achieve food security.

This also relates to thinking of the Green Revolution as a disempowering force, not just of women but of farming communities in general. The Green Revolution was a top-down enterprise. Technologies developed in the West and supported by the state were taken to farmers' fields with little input from them in the process (Kesavan and Swaminathan 2008). Farmers were often seen as incapable of adding to the process. As seen in the quote above, Wharton (1969: 476) views this group as "quiet, passive peasant[s]," which is a rather simplistic view of farmers. Science was though of as the only source of knowledge worth consulting and the scientific community had a huge role in creating the seeds, fertilizers, and pesticides that were the cornerstone of the Green Revolution. This reliance on technology (and assumptions about it) can be critiqued from a feminist perspective. There is a privileging of scientific knowledge rather than a demonstrated respect for local knowledge. Writing in 1987, Spitz claims that the very term "Green Revolution" is an ideological obstacle to recognizing people's creativity. It "implies breaking with old farming systems and techniques, instead of submitting them and the vernacular knowledge crystallized in them to the most sophisticated scientific research" (58). He is arguing that science has something to learn from local practices. There are now calls for more participatory forms of agricultural policy formation, one that involves farmers in giving input about local conditions so that the policies can fit local needs (Misra et al 2008).

Another contribution of the incorporation of gender is to problematize the cited causes of environmental insecurity identified in the policy discussions. This is particularly relevant in

this case given all of the attention that population concerns have received in the context of the declining yields in agriculture. Even in the early days of Green Revolution implementation, population control measures were envisioned by Northern states and organizations as going hand-in-hand with agricultural changes (Busch 2000). This was particularly important for the US, which viewed a successful Green Revolution as a means of avoiding a series of "red" revolutions. This suggests the use of women's bodies, which are the typical targets of population control measures, to fight communism. Additionally, it is hard not to reflect on this situation without thinking of India's "Emergency Period" of the mid-1970s in which repressive population control measures were implemented, many with the support of Northern states (Connelly 2006; Sen 1997).

One area that ecofeminists would challenge is the way that humans relate to the environment with Green Revolution practices. This includes water privatization that often goes along with agricultural practices. Privatization of water reduces a fundamental element of the environment to a resource for human consumption. Dubash (2004: 224) argues that

> the idea of water as a commodity...underlies the expansion of the market into the water arena. Treating water as a commodity alone, however, ignores the existing management systems and institutions within which current patterns of water control and use are embedded. It also ignores the ecological context within which water is harvested, managed and used. Instead, the deepening of commodification is a deeply political process through which markets are imposed on social and ecological context, or, more likely, markets are forced to accommodate a re-assertion of social practices and ecological realities.

Rather than recognize the close relationship between human and ecosystems, including aquatic ecosystems, water commodification justifies a dominant relationship between humans and the environment.

As mentioned above, the incorporation of gender concerns into discussions of agricultural practices is even more important in light of the calls for an agricultural revolution in Africa. There remains some question about how much gender concerns will be incorporated if new versions of the Green Revolution are to take off. In some instances there is evidence of organizations purposefully incorporating women's concerns in their research on agriculture. For example the M.S. Swaminathan Research Foundation tries to work closely with women in agricultural schemes. However, if food shortages emerge and there is a sense of urgency to address food security, gender concerns may not be given the attention they deserve. In discussions of a Green Revolution 2.0 in Africa, many local organizations have been skeptical about how new agricultural techniques and technologies will play out on the ground. Mamadou Goïta, a development socio-economist in Mali has expressed concerns about what taking seed control away from farmers in Africa would mean for their livelihoods, particularly female small-scale farmers (Gillis 2007). If they cannot afford to buy the new seeds or implement the new technologies, they could end up losing their livelihoods, as sometimes happened and was discussed above.

Conclusions

This chapter has used the ideas of security and environment discourses and gender in order to better understand the case of agriculture in the GBM basin. By using discourse analysis to analyze academic and policy discussions on agricultural practices, I was able to demonstrate that the *environmental security* discourse is currently the most typical means of discussing this

case. There are several elements of the discussion that sound like the *ecological security* discourse, however many of these are actually focused on human populations, making them more in line with the *environmental security* discourse. The *environmental conflict* discourse appears in discussions of the original motivations to implement the Green Revolution, but is not really seen in the discussions of the impacts of the Green Revolution or agricultural practices more generally. Additionally, I found that gender concerns are present to some degree in these discussions, however there is a larger role for these concerns, particularly in light of calls for a new Green Revolution. By using insight from various feminisms there are several contributions that the inclusion of gender can make to discussions of this case, including critically analyzing the power dynamics of the Green Revolution, problematizing the central elements of discussion- particularly population growth, incorporating multiple sources of knowledge, and questioning dominant discourses on development.

Even though the Green Revolution was largely implemented in Asia in the 1960s and 1970s, its impacts are still being felt today. This case is also particularly relevant for study because of the future demands on agriculture and the calls for dramatically altering the agricultural practices in regions like Africa. This will have wide-ranging consequences both for humans and the environment. In terms of water use, agriculture will continue to draw large quantities of water from aquatic ecosystems. "Today, agriculture accounts for 70 percent of all water use globally, up to 95 percent in several developing countries. To keep pace with the growing demand for food, it is estimated that 14 percent more freshwater will need to be withdrawn for agricultural purposes in the next 30 years" (UN Water 2006a: 6).

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Most of the critics of the Green Revolution do not underplay the immense pressure felt

to ensure food security in Asia in particular. However, they call attention to the negatives that

went along with the goal of providing food security. One wonders to what extent social and

environmental scientists will be connected with a new Green Revolution if it occurs.[67] During

the first Green Revolution, the consequences appear to have been little understood, and those

most directly impacted by them had little to no say in the changes being made. As with the

discussion of climate change impacting the future of flooding in the basin, noted in the last

chapter, there is talk of worsening scenarios in agriculture into the future as well. The World

Bank's 2008 *World Development Report* argues that "the future is increasingly uncertain.

Models predict that food prices in global markets may reverse their long-term downward trend,

creating rising uncertainties about global food security" (Quoted in Lang 2008: 32). Rising

income levels in China and India has led to a change in dietary expectations, which also impacts

these predictions. Some point to biotechnology as a solution to future food security issues,

however this brings with it a different set of challenges and questions (Hindmarsh 2003).[68] It is

likely that the connections between human security and food security will continue to be

heavily debated in the near future, and I hope that gender concerns act as a central focus in

these debates.

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[67] For example, Djurfeldt et al (2005) explore the lessons that can be learned from the Asian Green
Revolution and implemented into an African Green Revolution. In their edited volume, they argue that the social
and environmental impacts of the Asian Green Revolution have been explored elsewhere and are not as severe as
often suggested, so they will not consider them in their work.

[68] Normal Borlaug (2007: 15), the architect of the original Green Revolution has recently claimed that
"[a]gricultural science and technology, including the indispensable tools of biotechnology, will be critical to
meeting the growing demands for food, feed, fiber and biofuels."

Chapter 7 - Conclusion

If the way in which we describe reality has an effect on the ways we perceive and act upon our environment, new perspectives might lead us to consider alternative courses of action (J. Ann Tickner 2003: 22).

This final chapter serves as an assessment of the implications and consequences of including gender into discourses on security and the environment. In the chapter I make some concluding remarks about the ways that scholars use security and environment discourses, the prospects of incorporating gender into these discourses, and what the cases on water issues in the Ganges-Brahmaputra-Meghna basin tells us about the value-added of including gender. I conclude by identifying some potential avenues for future research on these topics.

Security and Environment Discourses

In chapter 2, I identified three discourses that scholars use when describing the link between the concepts of security and environment. These are *environmental conflict, environmental security*, and *ecological security*. The *environmental conflict* discourse is concerned about the prospect of populations engaging in violent conflict over resources. The primary storyline in this discourse is the link between violent conflict and environmental degradation. Secondary storylines include the particular links between conflict and environment, resource scarcity concerns, population concerns, human migration concerns, and unequal resource distribution/poverty concerns. This is an anthropocentric discourse due to the fact that the main concern is for human beings rather than for the environment. The *environmental conflict* discourse has close ties to traditional ideas of security. It represents the

addition of the environment into the realm of "high politics" rather than acting as a fundamental challenge to the way that security has traditionally been conceptualized. One area of overlap is the central focus on the security of the state that dominates both traditional ideas of security and the *environmental conflict* discourse. The state is seen both as at risk from instability if environmental conflict occurs, and as the dominant actor in stopping these conflicts.

Scholars who use an *environmental conflict* discourse often relate this set of ideas to states and populations in the global South. This is seen as an obvious focus by those who predict that resource conflict is more likely to occur in these regions, and it is seen as vaguely ethnocentric by those who argue that the focus perpetuates stereotypes of the South as being less civilized than the North (Barnett 2001; Swatuk 2006). *Environmental conflict* is the best known of the three security and environment discourses. Scholars like Thomas Homer-Dixon have popularized the *environmental conflict* discourse through extensive publication and discussion. Since it is the best known, it is not surprising that the *environmental conflict* discourse has garnered its fair share of critics. Criticisms include a lack of methodological rigor and the negative implications of militarizing environmental issues (Levy 1995; Gleditsch 1998; Deudney 1999). Despite these criticisms, the *environmental conflict* discourse continues to appear in discussions of security and environment.

The *environmental security* discourse is generally concerned with the negative impacts of environmental degradation for the security of humans. The primary storyline in this discourse is a concern about negative environmental impacts on human health and security. The secondary storylines include the environmental impact of accelerating globalization,

concerns over population increases, the spread of disease, the potential for sustainable development, and environmental peacemaking. The *environmental security* discourse is further removed from traditional conceptualizations of security than the *environmental conflict* discourse. The *environmental security* discourse is primarily concerned about human security issues rather than state security. This opens a role for both state and nonstate actors in helping to ensure environmental security.

There is some overlap among the *environmental conflict* and *environmental security* discourses, but they remain independent discourses. In the *environmental security* discourse, the security threat is located in negative consequences of environmental damage and those who are vulnerable are all human beings (Dalby 2002a). That being said, this is also an anthropocentric discourse since it is overwhelmingly concerned with the security of humans rather than the environment. In general, this discourse is broader than the *environmental conflict* discourse because of their concerns and foci. For example, there is space in the *environmental security* discourse to examine conflict over resources, but these resource conflicts will be evaluated based on their impact on human security broadly defined, not on their impacts to the security of the state.

Finally, the *ecological security* discourse is concerned about the protection or security of the environment from human-induced phenomenon. This is essentially an ecocentric framework. The primary storyline in the *ecological security* discourse is a concern about negative impacts of human behavior for the health or security of the environment. Secondary storylines that relate to this theme include evaluating the relationship between humans and environment, and challenging "traditional" conceptualizations of security. This is the discourse

that is furthest removed from traditional ideas of security. In fact, the storyline that challenges mainstream ideas of security points out the range of negative impacts that security operations inflict on the environment.

Through examining the recent security and environment discussions among academics, it appears that the *environmental security* discourse is gaining prominence while the *environmental conflict* discourse may be used less often in the future. For example, the few papers about security and environment that were presented at the 2009 International Studies Association convention were typically on panels about expanding our ideas of security. This suggests that this is where scholars are currently working and are likely to work in the near future. Another example of this is the direction of scholarship and policy debate on climate change and security. Even when climate change was discussed as a security issue by the United Nations Security Council a few years ago it was largely discussed through an *environmental security* discourse (Detraz and Betsill forthcoming). Discussions about the potential for conflict over resources were almost always included in broader discussions of the human impacts of climate change. In the general security and environment discussions the *ecological security* discourse has traditionally been the least visible of the three, and this is likely to remain the case in the future. This is largely due to the fact that it is centrally focused on the environment with humans playing a secondary role.[69]

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[69] The marginalization of the *ecological security* discourse because of its ecocentric nature is discussed further below.

Incorporating Gender into Security and Environment Discourses

Chapter 3 used feminist analysis to evaluate security and environment discourses in order to understand where gender could be incorporated into these discourses, and where there are incompatibilities. It would be naïve to assume that scholars would not have differing opinions about how gender should be incorporated into security and environment discourses, particularly in light of the variety of feminisms that I have drawn on. In this dissertation, I have offered some suggestions about how some of these various feminist traditions can be used to inform the security and environment debate and what the inclusion of gender concerns may look like. The goal of this endeavor is not to completely reject the existing discourses, but rather to encourage a dialogue that highlights the inclusion of gender.

In chapter 3, I concluded that the discourse with the most space for the inclusion of gender is the *environmental security* discourse. There is a tendency among scholars who use this discourse to problematize certain elements like the definitions of security and environment in ways that are consistent with feminist scholarship. Though this discourse is more compatible with the inclusion of gender, there are elements that need to be more clearly addressed through a gender lens. These include the relationship between humans and the environment, unequal gender impacts of population pressure and globalization, and the degree of institutional change sought.

There is some overlap between the *ecological security* discourse and feminist goals; particularly those of ecofeminism. Both sets of ideas reject the domination of humans over the environment, and instead see the two as intimately connected. Additionally, the *ecological*

security discourse includes the storyline of critiquing traditional conceptualizations and practices of security, something in line with much of the gender and security literature. However, the fact that the *ecological security* discourse is an ecocentric discourse makes it extremely unlikely that gender concerns would ever be a central element of the discourse. Since humans are not the key focus, gender concerns would not logically factor in the discourse in a fundamental way.

Finally, the *environmental conflict* discourse would require substantial shifts before gender would be easily included. The *environmental conflict* discourse largely fits within the traditional security paradigm that so many feminist international relations scholars find problematic. It is more of an attempt to add elements to traditional security instead of a necessary challenge to it. Some of the elements of the *environmental conflict* discourse that are difficult to reconcile with the inclusion of gender are the narrow definition of security, the level of analysis most often used, the focus on scarcity, and the lack of gender analysis in the suggested causes of resource conflicts. None of this is to suggest that I do not find the *environmental conflict* discourse useful in analyses of environmental politics. *Environmental conflict* scholars were influential in establishing the connection between security and the environment, and raising the idea of environmental problems into the realm of "high politics." For my purposes, however, there are major conceptual obstacles between this discourse and gender concerns. As can be seen in Table 3 below, there are shifts that would have to be made in all three discourses in order for gender to be incorporated.

Table 3- Gender in Security and Environment Discourses

	Environmental Conflict	Environmental Security	Ecological Security
Focus	-Humans	-Humans	-Ecosystems
Concern	-Potential for conflict over resources	-Negative impacts of environmental change for people	-Negative impacts of human behavior for environment
Ties to Security	-Adding environment to security	-Ties to human security	-Revision of security
Gender	-Examine idea of conflict with gender lens; -Examine multiple levels of analysis; -Problematize focus on scarcity of resources; - Examine potential causes of resource conflicts with gender lens	-Examine human-environment relationship; -Examine potential security threats with gender lens; -Examine degree of institutional change sought	-Incorporate gender into security critiques

Again, incorporating gender into security and environment discourses is something that builds on the existing debate over security and the environment, but revises some aspects as well as adds additional elements typically associated with feminisms in general, as outlined in Table 3. This implies that the security and environment debate will benefit from an ongoing dialogue between feminist scholars and scholars who currently use security and environment discourses, particularly those who use an *environmental security* discourse. The extent to which this dialogue will be fruitful will depend on the willingness of scholars in both fields to accept alternative viewpoints. From my own personal experience, the feminist community, particularly

gender and security scholars, have been more open to the idea of including gender into security and environment discourses than has the environmental studies community.

Chapter 3 concluded by offering a series of general shifts that the security and environment discourses would have to take in order for gender to be meaningfully incorporated. These include 1) engaging in multilevel analysis of security and the environment; 2) using broad and critical conceptualizations of security, environment, and scarcity; 3) paying particular attention to the unique security situations of women; 4) acknowledging a close relationship between humans and non-human nature; 5) examining what happens during times of conflict as well as their causes; 6) examining the impacts of militarization on both the environment and human beings; 7) critically assessing the causes of environmental insecurity as well as their potential impacts for segments of the population; 8) paying attention to multiple sources of knowledge; and 9) recognizing the possibility that solutions may need to reject the dominant institutional or societal structures in order to effectively address gender concerns.

Lessons from Ganges-Brahmaputra-Meghna Water Cases

The three GBM water basin case chapters offer interesting insights into both how security and environment discourses are presented in discussions of policy issues, and the contributions that including gender makes to these same policy discussions. Each of the cases showed that policy debates rarely contain only one discourse. On the contrary, even in situations where I expected a policy issue to be completely dominated by one of the security and environment discourses, the picture was more complex. Additionally, the cases offered

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interesting examples of the relationships between the storylines of the different discourses. This is often seen between the *environmental security* and *ecological security* discourses. An example of this is the following quote by D. H. Smith (2005: 2)

> Water is a key element of sustainable development because it is an essential component of life and income generating activities. But for too long the environment has been seen as a competing user. A response to criticisms of environmentally unsustainable water use may be that there is no other choice but to use water in an environmentally unsustainable way. However, this view of the environment as a competitor misses the critical point that the environment is fundamental to sustainable development. That is, if water is used unsustainably over time less is available to meet the needs of people. More specifically, if water is used consistently at a faster rate than it is replenished and/or if it is polluted so its use is restricted, then there are direct economic and social costs.

Smith argues that the security of both humans and the environment can be met through sustainable resource use. This suggests that it is unnecessary to view the storylines of the *environmental security* and *ecological security* discourses as incompatible. At the very least, it suggests that the picture is more complex that a simple dichotomy between the needs of humans and the needs of the environment.

Another type of complexity was seen in chapter 4, the case on management of the GBM basin. When I chose this case, I predicted that *environmental conflict* would be the discourse that was most prevalent. Discourse analysis of the policy debates show that most of the discussions, even those which focus on areas of conflict, also address other issues. This means, both the *environmental conflict* and the *environmental security* discourses are clearly present in the discussions of this case, with the *ecological security* discourse being marginal to most discussions. This means that the *environmental conflict* and *environmental security* discourses are going to be the most important for influencing the way that GBM management is

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conceptualized. The use of one discourse over another impacts how key concepts are defined, and the range of policy options considered to address the issue.

Gender analysis of GBM basin management discussions also demonstrated that gender is an extremely marginal part of these policy debates. There are only occasional, brief, mentions of water needs of women and their role in management schemes. However, by using insight from various feminisms there are several contributions that the inclusion of gender can make to discussions of this case, including broadening the scope of analysis, asking new questions, and conceptualizing key concepts in more encompassing ways. Broadening the scope of analysis includes examining insecurities at the level of the state, as is typically done, and beyond to include an examination of local and global insecurities tied to GBM basin management. This is a goal that is consistent with much feminist scholarship, and research on gender and security in particular. Asking new questions in the context of this case would include being reflexive about the labels we use to define populations in the region. Rather than assume that a population may be conflict prone, it is more useful to understand underlying issues of human insecurity that may lead people to act in certain ways. Additionally, we may be inspired to probe the roles of men and women in basin cooperation schemes. To date, it appears that men have had a larger role in these operations, which is problematic for the empowerment of women in the region (Prokopy 2004). Finally, conceptualizing central concepts in more encompassing ways would include a move away from thinking about the environment as solely a resource for human consumption to considering it as an entity with which humans have a complex relationship.

Chapter 5 provided a look at policy discussions on flooding in the GBM basin. This case demonstrated that while flooding has always been a concern for the basin population, there has been increased attention to the role of humans in worsening flood conditions. The case of flooding exhibited the security and environment discourses in ways fairly consistent with my starting predictions. I thought that because flooding has an immediate impact on the health and security of human populations, there would be a predominant use of the *environmental security* discourse for discussions of this case. For the most part, this is what occurred. The *environmental security* discourse was evident in discussions of concern over the health of human populations, the inability of a state to provide for the human security of its population, concerns over food security, the role of humans in worsening flood events, and using dams to ensure environmental peacemaking. There were occasional uses of the *environmental conflict* and *ecological security* discourses, but these were fairly marginalized overall.

I found that gender is not present in the policy discussions on GBM flooding to the level that I originally expected. There is some discussion of the different ways that men and women experience disasters, including their unequal experiences with rescue and relief efforts (Ramesh 2008c; Thompson and Sultana 1996). In the chapter I argued that there is a larger role for gender analysis in flooding discussions. By using insight from various feminisms there are several contributions that the inclusion of gender can make to discussions of this case, including examining issues of justice and vulnerability, problematizing the central elements of discussion, incorporating multiple sources of knowledge, and questioning dominant discourses on development. One of the most important elements of contribution that incorporating gender makes into these discussions is to call attention to strains of power. Incorporating gender

through feminist analysis allows us to ask questions about how power impacts how environmental damage and disasters play out. For example, in the case of flooding in the basin, we saw that some segments of society benefited more from flood management schemes than others. Feminist analysis encourages us to probe this finding in order to understand how strains of power are manifested. The powerful in society are likely to see benefits wherever benefits exist, and suffer least from environmental change.

Chapter 6 explored the policy discussions surrounding the impacts of agricultural practices in the GBM basin region. The policy debates on agriculture in the GBM basin were in line with my starting predictions about this case. I thought that because of the recent attention to the social and environmental impacts of agriculture, and to the Green Revolution in particular, there would be a large role for the *environmental security* and *ecological security* discourses in discussions of this case. This is largely what occurred, although the *environmental security* discourse was the most central and use of the *environmental conflict* discourse was minor. This case demonstrated that there are often instances where a source appears to be utilizing an *ecological security* discourse, however the discussion is not true to the ecocentric nature of the discourse. There are many times that links are made between environmental damage and agricultural practices, but with the ultimate goal of fixing the problem in order to benefit agriculture in the future. This is a case of an argument looking like an *ecological security* argument, but actually reflecting the *environmental security* discourse.

I found that gender concerns are present to some degree in these discussions, however there is a larger role for gender, particularly in light of calls for a new Green Revolution. Gender concerns are evident in policy discussions on agriculture in specific language recognizing the

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central place of women in agriculture, and their disempowerment with the introduction of technology-based agriculture practiced in the years since the Green Revolution. In the chapter, I argued that there are several contributions that the inclusion of gender can make to discussions of this case, including critically analyzing the power dynamics of the Green Revolution, problematizing the central elements of discussion- particularly population growth, incorporating multiple sources of knowledge, and questioning dominant discourses on development.

The issue of population growth was seen in some fashion in each of the cases. This is particularly important for this project, because of the gender concerns about population discourses in general. In chapter 5 and chapter 6 population growth was portrayed as worsening the impacts of environmental damage and threatening human security. Viewing this point through a gender lens means problematizing population growth "solutions" that do not reflect gender differences with regard to the issue. As was mentioned in chapter 3, many population control measures have had unequal negative impacts on women and girls over the years, including in India. This is a region where population is widely discussed, and these discussions must include a consideration of gender and gender concerns in order to avoid these negative impacts.

Each of these cases showed a large role for the *environmental security* discourse in discussing the environmental issue at hand. This may reflect the draw that human security issues have for policymaking. As I suggested in chapter 2, the salience of policy issues is likely to have a large impact on how policymaking takes place. The human security storyline in the *environmental security* discourse is particularly salient for much of the population in the GBM

region, therefore it makes sense that the *environmental security* discourse would be a popular one for discussing these environmental issues. People are more likely to take notice of an issue if there is a chance that it could lead to human suffering. This is particularly interesting to contrast with the *ecological security* discourse, which was only marginally used in each case. This is an ecocentric discourse, which lacks a dominant concern for the health and wellbeing of humans. While most people around the globe would probably express a concern about the security of the environment, this is likely to be a lower priority for them, and thus policymakers, than are human security issues.

For that matter, I was somewhat surprised that the *environmental conflict* discourse did not have a larger role in the policy discussions of the water cases. There was evidence of *environmental conflict* storylines in each case, however it was not the dominant discourse. This is interesting in light of the popularity of the *environmental conflict* discourse in academic discussions of security and environment links. The less prevalent position of this discourse in the water cases may stem from the nature of the issues themselves. As I mentioned in chapter 5, flooding is a case of having too much water, not a scarcity of water. Remember that scarcity is one of the key storylines of the *environmental conflict* discourse in general. It is argued that populations will often engage in violent conflict over access to a scarce resource. In the case of flooding, however, there is not as direct a link to scarcity issues. Chapter 6 showed that scarcity concerns played into the motivation to implement the Green Revolution techniques, but that concern diminished with increased agricultural yields. It is possible that the *environmental conflict* discourse would have a larger role in the discussions of other environmental issues.

Into the Future

This dissertation is important because of its exploration of gender in the area of security and the environment, a topic noticeably missing in the existing literatures. The key questions that this project explores are How are the issues of security and the environment linked in theory and practice; To what extent is gender a part of these discussions; and What are the implications of how these issues are linked? Likewise, what is the value-added when the gender elements of environmental issues are exposed, both theoretically and practically. Through examining the cases of water issues in the Ganges-Brahmaputra-Meghna basin, we now better comprehend both how discourses on security and the environment look in a real world, policy-relevant situation, as well as understand the particular contributions that incorporating gender into security and environment discourses offers to both the intellectual debate and policy-making process.

This represents a significant contribution to the field of global environmental politics in particular, and to international relations in general. This project links important conversations that are taking place in several "camps" within international relations, including those working on understanding decision-making, those researching global environmental change, and those who focus on feminist understandings of international relations concepts.[70] These types of links will hopefully help to break down some of the barriers that often separate scholars working within these different areas, opening up a dialogue that could significantly alter these areas for

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[70] The idea of "camps" within international relations comes from Christine Sylvester's participation a roundtable discussion at the 2007 International Studies Association conference in Chicago. Sylvester discussed her view that increasingly over the years, there has been less and less discussion between ISA sections, which represents the separation of international relations into distinct entities or camps.

the better. As a feminist international relations scholar with an emancipatory goal, helping to achieve dialogue that could potentially aid the policy-making process would be a noteworthy achievement.

The ideas and questions pursued in this dissertation have a wider applicability. In the near future, I would like to examine cases in different geographic regions and centered on different environment issues. For example, I would like to examine cases on climate change and its impacts in Africa, and biodiversity in Latin America. I feel that this would contribute to strengthening our understanding of how environmental issues are connected to security, as well as the role of gender in these areas. I am curious whether the *environmental security* discourse would be dominant in these sets of policy discussions in the same way that it is in the policy discussions of GBM water issues. Additionally, I am interested in evaluating the presence of gender in these policy discussions in order to understand if it is more visible in different regions. This will also give me the opportunity to continue to understand the value-added of incorporating gender into security and environment discussions if it is currently not a central element of the policy discussions.

A way for me and other scholars interested in these issues to explore gender in security and environment debates is through conducting gender sensitive investigations of widely discussed environmental concerns. In this endeavor, gendered assumptions about the way these issues are studied and the solutions most often proposed can be brought to light, thus aiding in both the understanding of environmental issues as well as the process of finding policy solutions to them. Site-specific explorations will both be important for conducting gender analysis of environmental concerns and highlighting the particular situation of women and

environmental degradation. Feminist scholars from other disciplines have undertaken projects

similar to this, and these studies will be valuable for those who wish to engage in a dialogue

with security and environment scholars (Newman 1994; Shiva 1988; Sontheimer 1991).[71]

Additionally, we as scholars should be mindful of potential connections that can be

made to organizations working to improve the security of women around the world. In October

2000 The United Nations Security Council Resolution 1325 was passed that calls for "the

prosecution of crimes against women, increased protection of women and girls during war, the

appointment of more women to UN peacekeeping operations and field missions and an

increase in women's participation in decision-making processes at the regional, national and

international level" (Cohn et al 2004: 130). While this may be an example of "bringing women

in" to security policy rather than challenging gendered assumptions, it can still be viewed as a

step toward incrementally changing the security situation for some of the world's women for

the better. Similarly, the United Nations Environment Programme has increasingly called for

gender analysis and examination of the needs of women as a part of their various

environmental projects around the world in recent years (UNEP 2006). These two examples

show that bringing gender into security and environment discourses may help scholars and

activists engage with influential international institutions in order to demonstrate the

important insecurities that women face, and hopefully influence the policy-making process in a

way that reduces the insecurities that women face. While the potentials for cooptation are

always a danger, the emancipatory goal of a perspective such as this makes active engagement

a necessity (True 2003).

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[71] Most of these types of studies have been more involved in calling attention to women's position rather than challenging gendered assumptions.

A final connection between this dissertation and on the ground research projects is to reach out to scholars working in the gender, water and development sphere. Across the conceptualizations of "women in development" (WID), "women, environment, and development" (WED), and "gender and development" (GAD), there has always been a strong correlation made between women and their role as water providers.[72] Ray (2007: 427) argues that "[t]hroughout the developing world, the task of providing domestic water is a female one. Thus the health consequences of lack of access to water and of transporting water on a daily basis, and the policy frameworks in which access can be improved, are of particular relevance to women and development." It may be useful to contact scholars in the development field in order to evaluate the theoretical overlap between the ideas in this dissertation, as well as to discuss the further policy applications that the project may have.

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[72] For more on the differences between these conceptualizations, see Ray (2007).

Appendix A

Fieldwork Information

**Interview Questions Asked to Environmental and Women's NGOs in India in October 2008:**
- Could you tell me a little bit about the types of things your organization is working on? (*This is designed to be an open question to get the interviewee involved in the process, as well as to give me a chance to see whether key words are being used.*)

- Do you see a connection between security and environment/gender? (*This is designed to highlight the type of security and the environment discourse being used. For environmental NGOs, I ask about environment and vice versa for women's NGOs.*)

- Do women face particular security threats? (*This is designed to specifically address gender.*)

- Does your organization do any work on gender/environmental issues? (*This is to explore links between gender and environment. I ask about gender for environmental NGOs and environment for women's NGOs.*)

- In particular, are there particular connections to water issues in the work that your organization does? (*This is designed to get information on my particular water cases.*)

- How can security issues be addressed or solved? (*This is intended to have interviewees discuss possible policy links.*)

- Are there particular challenges for policymaking that you have experienced? (*This is to further the discussion of policy links.*)

NGOs interviewed:

- Institute of Social Studies Trust (Women's organization)

- Women in Security, Conflict Management and Peace - WISCOMP (Women's organization)

- Aqua Foundation (Environmental organization)

- Centre for Science and Environment (Environmental organization)

- The People's Commission on Environment and Development India (Environmental organization)

Appendix B

Map of arsenic concentration in Asia
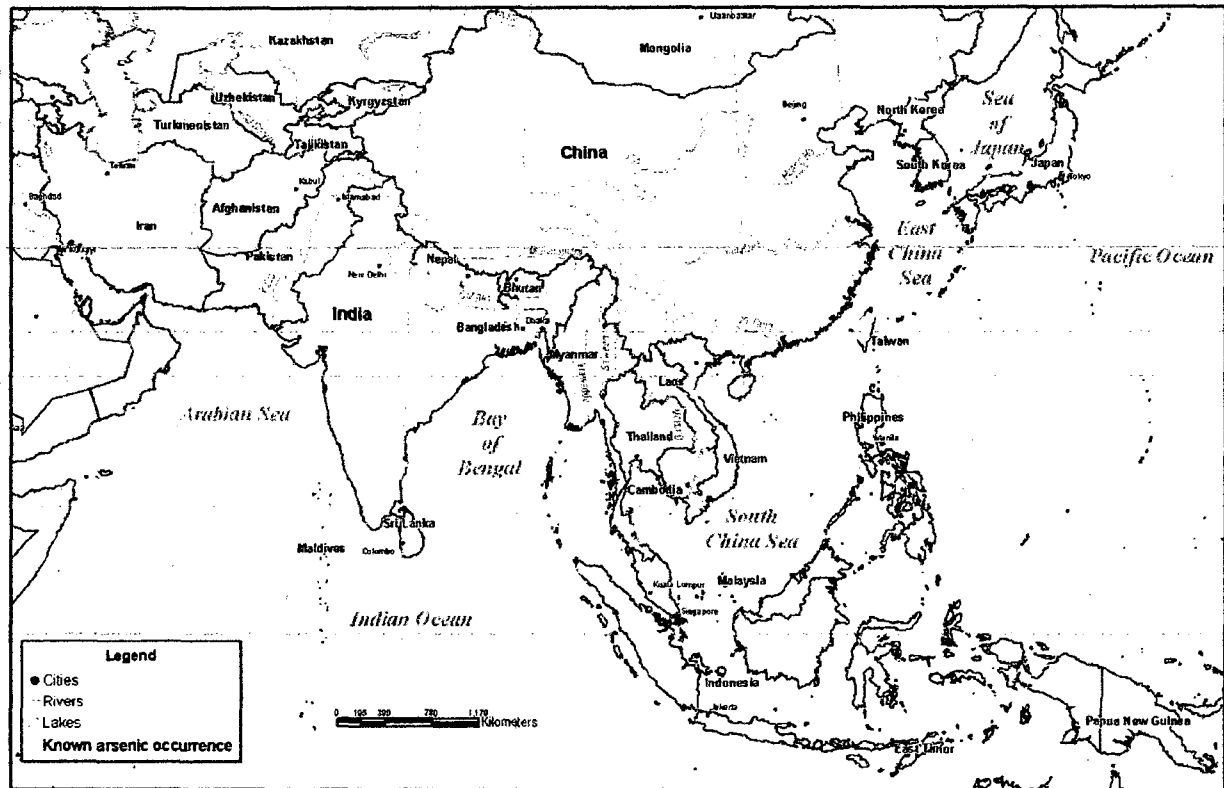
Source: Brammer, Hugh, and Peter Ravenscroft. (2009) "Arsenic in groundwater: A threat to sustainable agriculture in South and South-east Asia." *Environment International.* 35(3): 648.

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