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Ganga: River Health and Livelihood: An Exploration in the Relationship of Women's Health and Water in the Garhwal Region

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GANGA: RIVER HEALTH AND LIVELIHOOD

An exploration in the relationship of women's health and water in the Garhwal region

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SIT Study Abroad

India: Public Health, Policy Advocacy, and Community

Fall 2015

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Abstract

Overall, the intention of this study is to provide a bases for understanding how the livelihood of Himalayan women affects the health of the Ganga and vice versa. An apparent paradox between the destruction caused by development and one's own spiritual and religious fulfillment may explain the diminishing quality of the Ganga. Through interviews with Garhwali women and observations of lifestyles along the Ganga, a concept of women's interaction with water was determined. These perceptions and uses of water were compared to perspectives on degradation of the river. Pollution and water diversion projects serve as two of the largest struggles facing the Ganga. Through the course of several interviews, women expressed their worship of her waters, but with a withdrawn sense of spirituality. Many women acknowledge Ganga's pollution and overcrowding during pilgrimage season, which altered their involvement with the Ganga. Water scarcity also change lifestyle habits. Furthermore, road construction connects urban centers with rural villages along the Ganga, which proves beneficial for some causes but also led to increased rates of migration. Generally, village women regard themselves to be healthy. Finally, the damming of the Ganga causes widespread alteration of the natural course of the river and displaced thousands of families. Overall, women's reactions with their faith and access to water are infinitely tangled, and small changes can produce large disturbances.

Introduction*Objectives of study*

Through studying the cultural practices of women along the Ganga, the health of the community as well as the river can be explained. The subject of this study is the Garhwali

women due to their unique interactions and possible health outcomes. In addition, this target population narrows the focus of the study. Himalayan women are traditionally responsible for agriculture. Generally, their primary water resource are natural springs. Perception and use of the Ganga and springs can be compared and contrasted to develop an understanding of the general sentiment toward water resources. These practices may result in either protective or damaging measures toward their resources.

Alongside the traditional practices of these women, recent development is interacting with new culture. Housing, roads, and industry all stand to alter one's natural environment, and significantly affect the health of river systems. The objective of this study is to build a framework on the interactions between women, development, and their natural environment. The context of one's experiences may shape attitudes toward recent development. Furthermore, the paradox between society's definition of progress and one's own spiritual and religious fulfillment is apparent in Indian culture. This paradox may have an effect on the health in several different forms. It should be explained how development impacts health of these rural women.

Overall, the intention of this study is to provide a bases for understanding how the livelihood of Himalayan women affects the health of Ganga and vice versa.

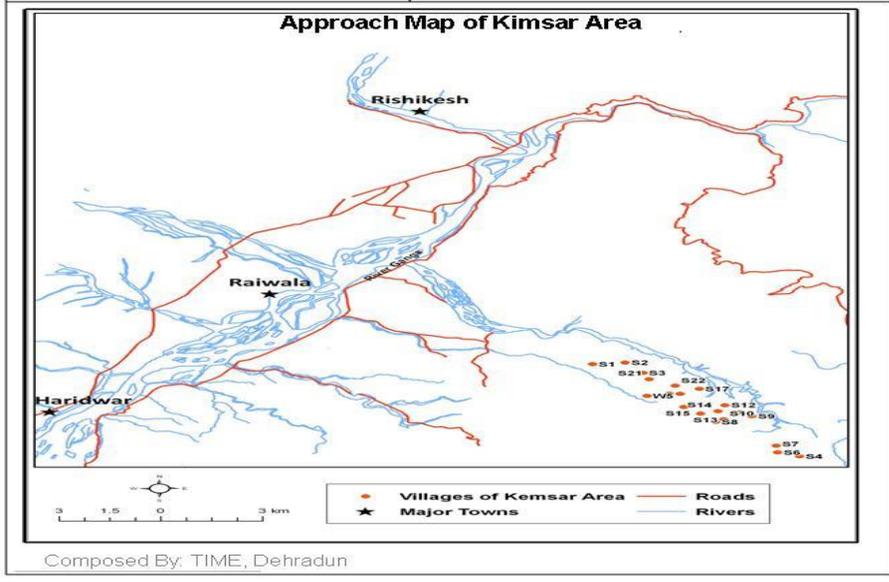
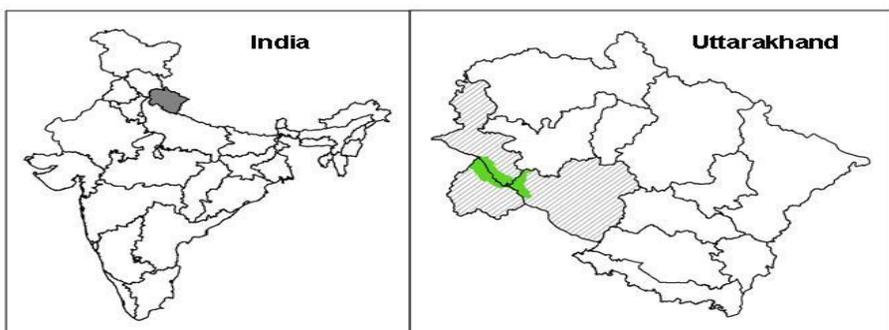
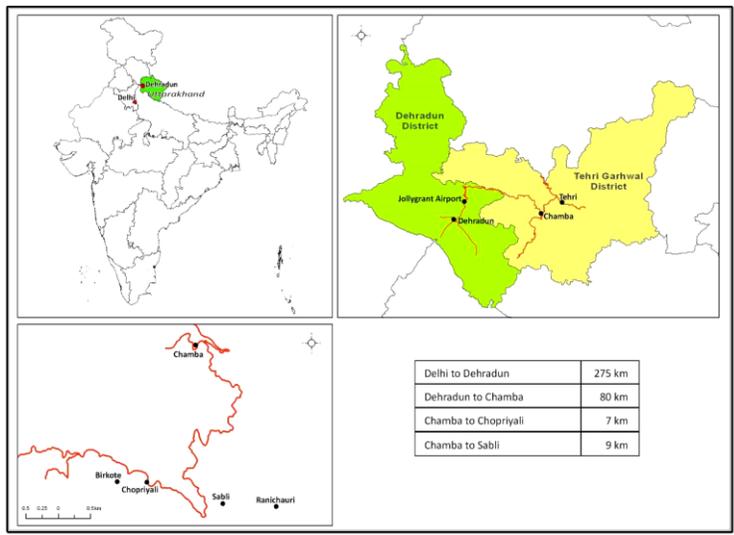
Research questions

How do cultural practices of Himalayan women protect the quality of the Ganges River?

- How do women access and perceive the resources of the river?
- How is the river negatively impacted by commercial interests?

Are these interests opposed by Himalayan women? If any.

Region



Courtesy of
Himalaya
Seva Sangh

Demographics

Average Age: 43.15

Average Age at Marriage: 18.14

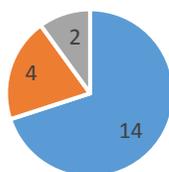
Average Number of Children: 2.4

Reside in Rishikesh: 4

Reside in Kimsar region: 15

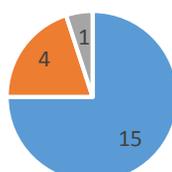
Reside in Khadi: 1

Family Owns Animal



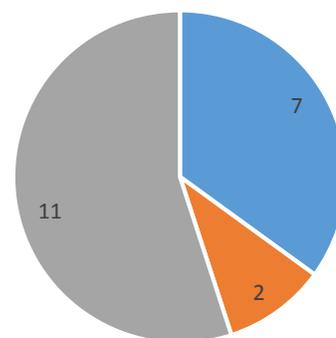
■ yes ■ no ■ N/A

Family Owns Land



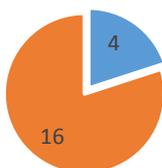
■ yes ■ no ■ N/A

Occupations



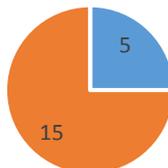
■ NGO Worker ■ Student ■ Housewife

Spring Water Source



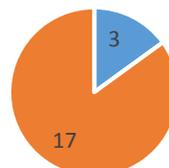
■ yes ■ no

Pipe Water Supply



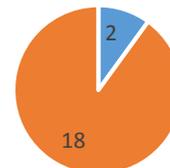
■ yes ■ no

Hand Pump Supply



■ yes ■ no

Filters Water



■ yes ■ no

Methodology

Collection of data was procured through two sources.

Interviews were taken with 20 village women to understand their interactions with water.

These interviews began with a full explanation of the intent of this project as well as positive

informed consent. Each interview lasted between 5 and 20 minutes. They began with basic

demographic questions and proceeded to more complex questions. While the questions varied

some, they were built around the same framework. In every case, the woman did not speak English and a translator was used.

All names in the study have been changed for confidentiality purposes.

Secondly, observations gave context to greater interactions and situations. These observations aided in the understanding of rural life in villages. They became very important when traveling along the Ganga, witnessing the construction of dams and roads. Along with the assistance of several NGOs, an understanding of the impact of these project was formed.

Taken together, observations and interviews, along with secondary sources, have contributed to the conclusion of the study.

Interview Questions

Demographic Indicators

1. Where are you from?
2. What is your occupation?
3. What is your age?
4. When did you get married?
5. How many children do you have?
6. What is your religion?
7. What caste do you belong to?
8. What is your family's income level?
9. How many animals does your family own?
10. What are the members of your family?

Religious Practices

11. How often do you practice the aarti?
12. What pujas do you perform?
 - a. How often?
13. What are your daily household responsibilities?

Agriculture and Land

14. Does your family own farm land?

- a. Who is responsible for agriculture?
 - b. What food does this land provide?
 - c. Have there been changes in the land you own?
15. What is your daily diet?
- a. How much of that food is grown on your farm?

Development

16. Do you have a road by your house?
- a. When was it built?
 - b. Have you noticed a difference in lifestyle after its construction?
17. Are there other instances of development or construction in your village?

Health

18. Have you or a family member contracted diarrheal illness?
19. Do you boil or treat water before consuming it?
- a. Why or why not?
20. How do you view bathing in the river water?
21. What is your biggest health concern as a woman?
- a. What is your biggest health concern as a mother?

River and Water

22. Is there a pipe water supply in your home?
23. Is there a hand pump in your village?
24. When and where do you collect water?
- a. For drinking?
 - b. For washing clothes and utensils?
 - c. For feeding animals?
 - d. For bathing?
 - e. For irrigation?
25. How close do you live to the Ganga?
26. Do you utilize Ganga river water?
27. What is your connection do the Ganga?
- a. How often do you interact?
28. Has the Ganga changed in the past ten years?
29. Do you have knowledge of pollution of the Ganga?
- a. How does this pollution affect the river?
 - b. How does development affect the river?
30. Overall, how do you view the Ganga as a part of your life?

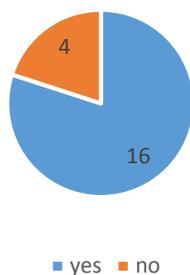
Bias

It is important to note the several areas of possible bias. The researcher, coming from a Western education, made an attempt to record the most objective of observations. Along with information gathered from the women, NGOs, and literature, conclusions were then formed.

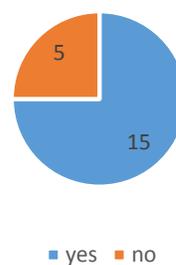
Another area of bias was through the act of translator. The translator did their best to be impartial between conveying answers to the researcher.

Results and Discussion

Knowledge of Pollution



Bathes in Ganga



Not Just a River

The Ganga River is not referred to as such in the Garhwal region. Rather, it is addressed as “Ganga Ma” or “Mother Ganga,” personified with the pronoun “she.” Understanding her regard for so much more than a physical body of water is imperative in forming an understanding with those who interact with her. Ganga flows through more than the eastern states of India. Her tributaries form an expansive network, channeling itself into the main body, before releasing themselves in the Bay of Bengal. These tributaries are easy to come across whilst traveling along the river, and they are just as jeopardized by unsustainable water use. As these streams, creeks and rivers themselves dry up, they expose the Ganga to

vulnerabilities. While the Gaumukh Glacier is regarded as the origin of the Ganga, the river's flow is given power by these tributaries. The Gaumukh Glacier, itself, is facing an uncertain future due to climate change. Rapid melting and delayed snow fall have altered its flow. The Ganga is joined by several other rivers to complete its course (*Project Submission Under Nirmal Ganga Bhagidaari 7-9*). If these waters interact with the Ganga, they are considered Ganga. This became especially apparent while several interviewees commented on their bathing habits. When asked if they bathe in the Ganga, they responded that they did, by taking daily trips to their spring. This spring provided not only the physical resource of water, but the spiritual cleansing of a bathe in the Ganga. It is not easy to decipher where the Ganga begins and ends in the households of these women.

In a religious sense, there are several mythologies on the origin of the Ganga. As with most Hindu mythology, there is not simply one accepted belief. One of the most prominent stories of the origin begins with a king named Sagar. He put on an Ashwamedh Yagna, or horse sacrifice, to assert his power and dominance as king. The horse was set loose and King Sagar ordered his men after it; if his army captured the horse, Sagar would become the king of kings. While Sagar had a great army, he also had sixty thousand sons from his first wife and one son from his other wife. The sixty thousand sons told their father they would pursue the horse instead. When the sons finally caught up to the horse, he appeared next to a saint, Kapil, who was meditating in the middle of the forest. The sons acted rashly and disturbed the saint during his meditation. Kapil opened his eyes, enraged, and turned them all to ashes. After months of silence from his sons, Sagar sent out his remaining son, Anshuman, for the horse. Anshuman happened upon Kapil, the horse, and a pile of ashes. Not wanting to disturb Kapil's

meditation, he waited for the saint to open his eyes before explaining his predicament. Kapil explained that he would send his brothers to heaven if he first pleased Mother Ganga, and she would wash away their ashes when she was brought down to earth. Anshuman returned empty handed and meditated with his father. They both passed away, followed by Anshuman's son. Finally, Anshuman's grandson, Bhagirath, performed tapasya standing on one leg for a thousand years on a rock. This pleased Mother Ganga, but ordered Bhagirath to please Lord Shiva so he could control her waters once they were released on earth. After more meditation, Lord Shiva was pleased and called on Mother Ganga. As Lord Shiva unwrapped each of his locks, Ganga was released down from the heavens to Gangotri. As such, the river until Devaprayag is known as Bhagirath (Hollick 22-25). Another, more astrological theory, is cited in the Bhagavata Purana. Lord Vishnu, when faced with the evil king Bali, took three great strides, placing one foot on earth, one foot in the heavens, and one foot on Bali's head ("Spiritual and Cultural Traditions"). Having pierced heaven with his toe, water fell into Brahma's pot and became Ganga. She was then cast about a cosmic journey before running through the sky as the Milky Way (Eck 146). This cosmic presence is often referred to as Akash Ganga. While so much of this history seems trapped in the tediousness of the scriptures, many Hindus exhibit a reverence for these stories. The intangible nature of the Ganga was reinforced in a conversation with a spiritual Hindu man, Ram. Ram described his relationship with Ganga as much more than interacting with her waters, saying,

"We consider it as a holy river. We feel it is like Lord Vishnu has carried the water and is giving it to people through Ganga. The Akosh Ganga, the Ganga in the sky, has a connection with the river on the ground. There is a god inside all of us. We consider Ganga as holy. With pure mind, clear mind, if you take a dip in Ganga, all the diseases it cleans."

Clearly, the religious texts highlight an understanding of the sacredness of her waters. Whether these stories have been passed down through scripture or oral tradition, they leave a mark on the importance of Ganga as a source for spirituality.

No clearer is the Ganga's religious importance noted than in her depiction as a goddess. Through the course of several interviews, women, again and again, expressed their worship of her waters. Out of the twenty women interviewed, all of their households kept Ganga water in containers. This Ganga water is used for pujas and rituals. In the Sanskrit epics and Puranas, the praises of the Ganga are described through several prayers. Even the simple act of chanting her name has the power to alleviate harm and provide protection. More involved worship of the Ganga, such as cremation along her banks, has been said to give moksha, or a release from reincarnation (Eck 138). While these elaborate forms of worship are becoming more difficult for some Hindus to practice, whether due to financial hardship or old age, the Ganga does not need to be worshipped from solely along her banks. The bottles of Ganga water stored in these households have the power to bring Ganga to any body of water. In fact, in the case the Ganga is unreachable, any stream can bear her power. In the home of temple, the goddess Ganga is presented by mixing a few drops of Ganga water or chanting her name in ritual. In this, one can see how Ganga is the metaphorical source for every sacred water and every sacred water contains her glory (Eck 138).

Old and Young Attitudes

While the Ganga's religious sanctity may be universal to all waters, there was a marked difference in the attitudes toward her in older and younger generations. During the course of

the interviews, a range of ages were asked about their connection to the Ganga. Two interviews in particular characterize this age gap. The interviewees were both employees at the non-governmental organization GOONJ. GOONJ collects discarded cloth and materials and recycles them into new initiatives. Their projects include Cloth for Work, which addresses community needs by offering clothing as compensation to village workers, and Not Just a Piece of Cloth, which gives reusable, washable cotton sanitary napkins to village women and destigmatizes menstruation. While GOONJ has operations in 23 states, the Rishikesh office is nearest to the Ganga and employs 66 women. One of these women, Deepa, works in the office monitoring data collection. Deepa is 38 years old and has three children. She performs daily pujas as well as attends the aarti held on the banks of the Ganga at least once a week. While she was raised in a village, she moved to the city of Rishikesh after marriage. Her water source drastically changed between these two places. In the village, she collected her water from a source, but currently has a hand pump by her home. Of the 20 women surveyed, she was the only woman to filter her water, having knowledge of possible bacterial infections. This knowledge of water's impurity translated to her view of the Ganga. Deepa reflected,

"She is like a mother so we should keep it clean. When outside come to wash their clothes in the river, we tell them they should not. One person is taking a bath, one person drinking the water. It does not look nice." Throughout the interview, Deepa referred to the Ganga as mother, saying "we call her a mother, we should give her the dignity of a mother and not pollute it."

Her sentiment toward the river, her daily prayers, and her desire for protection are reflected toward these attitudes. Calling the Ganga "mother" is an ultimate sign of respect. These notions are recording in religious texts. In the origin story of Ganga, as she flows to the plains, she embraces the qualities of a mother. She nourishes the land, even though she has the

power to destroy it. In the *Rig Veda*, the Vedic poets said that the waters “ran out upon the earth like mother cows to suckle their young, like milk cows rich in milk.” Furthermore, the poets beg of her blessed nectar and protection (Eck 147-148). The epitome of the poetic acknowledgement of the Ganga as a holy mother is in Jagannatha’s *Ganga Lahari*.

“I come to you as child to his mother.
 I come as an orphan
 to you, moist with love.
 I come without refuge
 to you, giver of sacred rest.
 I come a fallen man
 to you, uplifter of all.
 I come undone by disease
 to you, the perfect physician.
 I come, my heart dry with thirst,
 to you, ocean of sweat wine.
 Do with me whatever you will.”

-*Ganga Lahari* verse 24, translated by Diana Eck

With three children, it is possible that Deepa felt the attraction, the connection to a mother like her. In contrast, when 23 year old Anushi was interviewed, she displayed a weaker relationship with the Ganga, even though she lived right along her banks. She often found herself too busy to attend the aarti and never bathed in the river because it is too cold. When asked about her connection to the Ganga, she claimed she “never really thought about it.” Instead, much of the conversation focused on her hardships growing up, as her father passed away and her and her mother had to excavate sand from the banks of the river to sell for a livelihood. Her life was a struggle, and it did not allow her to explore her faith. Currently, she is unmarried and without children. By having to support her family by taking from the river, she may never had the chance to see the Ganga as a spiritual entity, only one that provided income. And now, without a family of her own and a demanding work schedule, there was nowhere for the relationship to

grow. Her youth may also contribute to her delated spirituality. These kind of sentiments were echoed in several interviews with young women living in rural areas. In the Kimsar region, another 23 year old, Irene, was quiet when it came to her responses about the Ganga. Despite spending almost an hour every day collecting water from the spring for household uses, she never questioned the role of water or the Ganga. To her, it was a part of her routine lifestyle, not a struggle, simply a consequence. She had never visited the Ganga River itself.

As development has infiltrated both Rishikesh and the more rural area of Kimsar, water has not been excluded. While water is mostly taken from the springs in the villages for drinking, water bottles are increasingly popularized in urban centers. Moreover, government schemes have moved in, attempting to provide pipe water to far-reaching areas. In the Kimsar region, these schemes have largely failed and may only provide water up to once or twice a month. As water becomes a commodity to be bought and sold, new attitudes are reflected. These new attitudes push away the need to form a bond to one's water source, as it reduces the thought of these daily actions. Anushi and Irene have grown up in a different society from their elders, one where water has been reduced to the background, rather the forefront of spiritual thought.

Water as a Luxury

While there certainly were patterns in age groups, there was an overall sense of depressed spirituality in connection with the Ganga. It was surprising that the women who were interviewed did not have more outright devotion for the Ganga. When asked about their connection to the Ganga, or water in general, many struggled to come up with the right words.

Maansi, 62 years old from the Kimsar village, worked hard to harvest her water. About four times a day, she makes the steep climb down to the spring source and then back up to the village. She was careful about her water consumption, saying "We don't waste water because we know if we do, we must go to the spring an hour walk away." But when it came to the spiritual aspect, Maansi claimed she lacked a connection, in part, due to the dirty nature of the Ganga. She saw the physical river as polluted, while her spring was clean. Again, the sentiment of the spring being her Ganga was reiterated. Her old age prevented her from going to the closest river to partake in a holy bath or religious ceremony. In her household, her concentration was collecting water and providing for her family. It is clear that women in the Garhwal region account for much of the labor. When asked about their household responsibilities, these women cared for the animals, agriculture, washed dishes and clothing and cooked food. Their work is hard, and it wears on them. It seemed as though thinking about anything philosophical beyond the necessity would be a luxury. There were other luxuries that these women did not partake in. As mentioned earlier, only one of the twenty women interviewed treated their drinking water before consumption. Several women noted that the spring water was "clean" or "pure" and, therefore, it was not necessary to boil or filter it. Other women truly never thought twice about it. The time spent collecting water often deterred women from seeing it as anything beyond a resource. On average, the women interviewed from the Kimsar region spent between one and four hours a day collecting water from the spring. With large brass pots, called bantas, placed on top their heads, they would make the trek down the valley to fill their basins and feed the larger livestock, and return to their homes. This effort often consumed much of their days. From this perspective, water is a

necessary burden. A local non-governmental organization, Himalaya Seva Sangh, seeks to alleviate this water while providing safe, clean drinking water. In the Kimsar Village, they have installed 36 roof water harvesting tanks to local homes. Each one of these tanks holds approximately 5,000 liters and can be filled within one rainfall. In a village often times facing acute water shortage issues, many women expressed their gratitude for this time, and life, saving effort. It is interesting to note that while many of these homes had access to harvested water, the women would still take trips to the local spring. Most notably, if they were physically capable, women would bathe in the spring, aided by the construction of temporary bathing rooms. It was difficult to decipher from their answers, but these women believed in the power of a holy dip in the Ganga as well. Viewing the spring as Ganga, their trips to the spring could not end with a shift in water source. That being said, the roof water harvesting tanks were received well in the Kimsar region.

One family with a roof water harvesting tank especially optimized its benefits. By transporting water in tanks strapped to their several horses and cattle, the family sells their excess water to construction sites. They actually profit from their roof water harvesting tank. After hearing from some women who struggled through drought and dry seasons, this family prospered in those times. For them, water provided more than nourishment, it provided a livelihood. The patriarch described this relationship, saying "when it is raining, our business stops. Water is everywhere. In the summer, we have a lot of work when there is water scarcity. Marriages in families, more people coming, we bring water." The matriarch had the same religious respect for the Ganga, calling her mother and claiming her purity. When asked for her connection with water, one could see her sincerity when she simply put it as "very

important.” In Kimsar, there are women who have gone through periods of water scarcity, and other women profiting from these periods. In this paradox lies the truth- that water is unequivocally necessary for survival. This cycle of survival is so inherent in the lives’ of these women that they have not comprehended water as anything more than just a part of life.

Water Scarcity

More specific instances of water scarcity were identified amongst the interviews. Water scarcity was a major concern for the households interviewed in the Kimsar villages. All of the women cared for unirrigated land. This land yields crops for both market value as well as family sustenance. Rain was the main source of water for these crops. These women understood the danger that came in times of drought. In one household of a Himalaya Seva Sangh volunteer, the family kept three years’ worth of millet, rice and mustard in the case of food scarcity. The matriarch, Amrita, had gone through droughts and had the foresight to protect her family against future ailments. Amrita also provided much insight into the thought process of a Kimsar woman. When she began her interview, she was reserved in many of her responses. By the end of the conversations, she was provocatively thinking about the role of water in her life. She was present for many subsequent interviews and encouraged her friends to open up about their own water use. Never having the opportunity to consider its importance, she was thankful for the conversation to be started. Amrita represents a women who has taken every precaution to keep her family healthy and well fed. With her life consumed by these efforts, it only took a few questions for her to realize the connection between her thoughts and her actions. Other women in the Kimsar village also expressed their concerns for water scarcity.

One woman discussed how, while the spring never completely dried up, more time had to be spent at the source, feeding cattle and filling up their bantas because of the reduced discharge.

The entire state of Uttarakhand is no stranger to water scarcity. According to a recent 2015 article, “as many as 17,000 natural water sources in this small mountain state have either dried up or are in the process of drying up (

Bhatt).” Water scarcity can have environmental implications, caused by climate change and changes in weather patterns which affect the rainfall on agricultural land. This, in turn, causes food insecurity. Secondly, water diversion has a significant impact on discharge of river systems. The most concrete example of this within the Garhwal region is the Pashulok Barrage, located on the edge of Rajaji National Park between Rishikesh and Kimsar. The barrage dams the Ganga in order to divert water to the Chilla Hydroelectric Plant to power Delhi. Here, the Been River meets the Ganga. The Been River supplies water to the springs which provide water to the Kimsar villages. In order to reach Kimsar during any season outside of monsoon season, one must literally drive across the now dried up silt bed. This is just one element of development altering the landscape of these rural areas. Yet, with its potential effect on small villages, there are mixed feelings about its construction. When Manali was asked about the changes she witnessed to the Ganga, she had two reactions, saying, “We observe two major things. During religious melees, we see it become dirty. The second is the water diversion. But we are fine with water diversion because it produces electricity.” The Kimsar village is not benefiting from the power output of the Chilla plant. But within this response, the contradiction of development and religion comes to a head. This women wishes to practice her religious duties along the Ganga without the crowds and pollution in recent years, yet she

condones the diversion of the holy source in the name of electricity. Many women commented on the increased crowds at the Ganga during religious melees, and it's clear this is stark, measureable change that personally affects their individual worship. Inversely, the potentially long-term, removed effects of damming the river do not hit as close to home. It is easier to excuse the damage caused to the Ganga when it does not deliver an obvious drawback. But for some women, water diversion was a true concern. These women had the history of seeing the river flowing freely, and, now recently, witnessing it dry up. An especially heartfelt response came from Amrita about the subject. She reflected,

"When we were children, there was no pollution in the river. There was not a canal. It was simple and we would cross the river by boat. In 1975, the bridge was constructed. Before that, we could walk along the river. It was very beautiful. Now I feel bad and I do not feel like taking a bath."

To her, the benefits of the hydroelectric power project certainly do not override her nostalgia for an untouched river. She displays consciousness of the negative exposure of damming the river. This cause of development has directly harmed her ability to spiritually engage with the Ganga. It is possible that the drying up of this national landmark is also shifting the culture of her beauty. Amrita herself, cognizant of her family's food vulnerability, is a woman who circumvented the issue of water, from development to sustainability. Her realization of many adverse elements against her source of water display an awareness for the issue of water scarcity.

Development and Migration

While barrages and dams certainly account for much of the development along the river, road construction is one of the most obvious signs of urban life superseding rural

lifestyles. In Kimsar, the road leading to most of the villages visited was built in the 1990s. The road not only increased local accessibility to neighboring hamlets, but also greatly improved access to the nearby city of Rishikesh. Several women recounted times where they had to carry loads of surplus goods on their heads in order to make sales to Rishikesh. The trip would take nearly the entire day. With the advent of the road, these women were able to easily access an expanded market place for their surplus crops. The changes it brought to their lifestyles are looked upon favorably; most notably, one woman said, "Since it was built, it has been a big change. Earlier, just to bring one head load, it would take a whole day from down there. It has improved with the coming of this road." Furthermore, the road allowed the village people to access the resources of an urban center while still enjoying the comforts of rural life. In many cases, these resources were a matter of life and death. Health care facilities are especially lacking in Kimsar, as well as many rural areas. One informant reported that the nearest hospital was 30 kilometers away in Rishikesh. Even with the road, she still sees the distance as a barrier, especially during pregnancy when it can be dangerous to cross through the forest in order to enter Rishikesh. In contrast, another woman reflected on, with the construction of the road, a primary health facility built in the region which provided basic medical care. While these women highlighted the benefits of this new landmark, several also lamented on its drawbacks. Many Garhwali villages have seen large migrations of populations to urban centers such as Rishikesh, Haridwar, and Dehradun (Bhatt). A recent United Nations study forecasted that India will more than double its urban population from 367 million in 2010 to 915 million in 2050 (UN 2011). These cities offer the allure of bountiful jobs and newfound freedom. Often times, migrants find themselves disconnected from their family and lost. Overpopulation causes a

strain on resources and overcrowding leads to several health concerns. Urban slums become more and more populated as people feel an inability to return to their villages (Butsch et al. 3-4). Himalaya Seva Sangh and other non-governmental organizations promote village life by elevating access to clean water and ample food as well as encouraging traditional agriculture for livelihoods. In the mind of these organizations, keeping people in the village reduces the problems that accumulate with city life. The village exodus is prevalent to those who remain. A 68 year old woman, Neyha, was asked about recent forms of development in her village. Besides noting the road construction, she also reflected on the ways modern technologies have infiltrated her village lifestyle. Neyha commented, "Earlier we used to grind our own grains and now there are machines that do it for us that make a difference. Now most people migrate out of the village to educate their children." In this, she conceptualizes development not only as a piece of equipment that has altered their agricultural methods, but also as the crux to the issue of migration. In addition, she reveals another motive for city migration- education. Kimsar has one local inter-college which educates students until the 12th standard. Students walk near and far to attend classes, but upper levels of education must be sought elsewhere. Two young students who were interviewed attended university in Dehradun, but would often travel back to their home village. These young women held on dearly to their rural lifestyle, while still acknowledging the necessity of education. They see the road as essential, for it gives them the ability to receive their education. But with their expanded city views, one student hoped more of that lifestyle would reach her village home. She noted her access to running water in Dehradun contrasted by the practice of collecting water at the source, approximately one hour every trip. To have the running water in Kimsar would be a great convenience. While the road

has certainly afforded both conveniences as well as significant improvements, these young women were not quick to give up their rural roots. When asked if they'd prefer a husband with a home in a village or the city, they joked that they'd want one with both!

Perception of Health and Pollution

Another pattern arose which indicated a preference to the rural lifestyle. While isolated, rural communities face their own set of adverse health issues, realized perceptions are to the contrary. When asked about major health concerns in the Kimsar village, the most noted response was indifference, beyond the typical cough and cold.

While some women did not perceive any serious health concerns, underlying conditions were prevalent. As detailed by Sonali, the process of collecting water from the spring in the Kimsar region can be taxing. While none of the other women came forth with this information, it must be noted that Sonali revealed the nature of this health concern as if it did not have to be stated. In an offhanded manner, she remarked "What can I say, there are several problems for women. Back ache, hard work is tough on our knees. Carrying water, carrying stuff, we do lots of hard work." It seems that the lifestyle of the Garhwali woman can be demanding, but in a way which most women have adapted. Women never think about the health concerns in carrying the banta on their head because there are no other options. They cannot anguish in the time it takes to make a single trip to the spring because the alternative is going without. On average, the women interviewed in the Kimsar villages would spend anywhere between one and four hours walking to and from the spring. Upon observation of the spring, the trek is not an easy one. The source is located on a steep incline, at the bottom of a valley. Sometimes,

women bring along the larger cattle to feed from the spring. Depending on the location of their home, the walk could be up to four kilometers in one direction. Carrying jugs and bantas, each holding 15 liters, cause strain on the joints and can cause thinning of hair on the head.

While these problems were apparent, several women expressed their belief that living in the village was better for their health than life in a city. One woman summarized this notion by saying, "We are happy. The environment is clean. The air is clean. We do not want to go to the city. There are all diseases in the city." Air quality is a measurable health indicator for these women who have experience traveling between cities and villages. Air pollution is a mounting concern amongst urban centers due to motorized vehicles. With the increase in these vehicles and infrastructure unable to effectively respond, respiratory illnesses are on the rise in urban India (Butsch et al. 20). Even with the limited access to health care facilities, families still have a positive outlook on their own health. They perceive the natural environment to be a greater indicator than the manifestation of illnesses. This perception is not unfounded, as cities are challenged with developing health determinants such as "deteriorating environmental conditions, continuing social fragmentation, and overburdened urban infrastructure (Butsch et al. 1)." The diseases prevalent in cities mentioned in this testimonial can allude to a variety of conditions. Cities must react to the emerging concerns of HIV, TB, dengue and diabetes, to name a few (Butsch et al. 2). The health disadvantages mentioned by these women are due to their awareness of overcrowding in Rishikesh. These women observe overcrowding when they attend melees and festivals along the bank of the Ganga during religious occasions. The increase in religious pilgrims to cities along the Ganga is a growing concern for a number of women. They connect the concentration of people along

the ghats (banks) of the Ganga during these events as a direct correlation to the increase in pollution. They noted the increase in plastic wastes thrown into the river as a result. This process takes a toll on the relationship with one woman in particular, Tanya. Tanya was deeply saddened upon reflecting on the pollution of the Ganga. Her own religious practices are impeded by the pollution, "I go to the river every once in a while for ceremonies. We have good feelings for Ganga, but people are throwing everything into the Ganges and it makes me unhappy." It appears that her spirituality is diminished with the corruption of the river's health. For the Ganga to be so revered, yet so abused at the same time, it produces conflicting feelings. Tanya's sentiments about the river are affected by its treatment by others. In all, majority of women acknowledge pollution of the Ganga or one of her tributaries. Only four of the twenty women interviewed had no knowledge of pollution. Some women stated it as fact, saying, explicitly, "There is pollution and everyone knows it." While the interviews revealed a variety of sources, the main causes of pollution include waste waters from drains and sewers, garbage disposed in the river, chemical and water wastes from industries, unsafe deposits of insecticides and pesticides from agriculture, animal carcasses and half burnt and unburnt human carcasses into the river and defecation on the river banks (Agarwal 71). The practice of cremation is integral to Hindu tradition. It is believed that if one dies on the banks of the religious city Varanasi, or if one's ashes are spread in the river, that one's soul will "break the perpetual cycle of *samsara*, of birth and rebirth, and thus achieve *moksha*, eternal liberation (Conaway)." The fact that, in following this custom, one is also degrading the source of such faith is contradictory. But other sources of pollution emanate from less religious practices. The hundreds of factories along the Ganga release "mercury, highly toxic heavy metals such as lead

and copper, and various synthetic chemicals (Wohl 1).” And these contaminants cause more damage than simply an aesthetic degradation. Toxic chemicals, most prevalently PCB, find their way into the tissue of humans, domestic animals, and wildlife. Concentrations of these compounds increase throughout the food chain and can have carcinogenic effects as well as altering development and reproduction (Kumar 3).

Exploration into Damming of Ganga

Perhaps the greatest intersection of development and environmental health are the dams in Uttarkhasi along the Ganga. Before an analysis of the destruction and health affects these dams caused along the river, it is important to understand the history from a personal perspective. Sita was a founding member of the Chipko movement. The Chipko movement began in the 1970's to organize protests against tree felling in the Himalayan forests. After several successes in this movement, some members began to advocate against water diversion projects along the Ganga. Sita was one such woman. Her childhood home was on the banks of the Ganga, in a village called Koti. Now, her once beloved home is submerged by the Tehri Dam. She explains her passion for activism due to the values instilled in her as a child. Her life revolved around the tradition of the Ganga. Her family would rise early in the morning on festival days and wake up neighbors, before the sun even rose, to make it to the river for prayers and a holy dip. She studied along her banks. When the Tehri Dam was built in 2005, Sita and her family were displaced to the village of Khadi. This displacement changed her life, as she recalls, “My childhood house is submerged. I feel sad about it. There are memories. All these things have changed, all our people have been displaced. We used to live in Tehri Township and do things all together, shopping and getting things. All that has gone so we miss that.” The

Chipko movement organized action and marches against its construction, but ultimately government greed won. Sita understands that this push for development and supply of agriculture is to the benefit of few and the cost of many. Thousands of families were displaced and entire villages were submerged by the Tehri Reservoir. Compensation was provided in limited cases, but many question the true impact of financial compensation when quality land was not the only thing lost, but a culture and community. Sita poignantly describes the crux of Chipko's protests, testifying

“I feel it was not as much development as destruction. Forest were cut because of the main lines to transmit electricity. People were thrown out of their cultural space and heritage, their temples, their houses, their crematoriums, where their people were buried. Their spiritual connection has been destroyed. This development was for the capitalists, the rich, the haves. For the common man, the poor, it was destruction.”

The Tehri Dam certainly has caused unimaginable destruction. Despite large scale protests, the government pursued the project. After its construction, new roads were to be extensively built to accommodate the new landscape. Landslides frequently occur surrounding the reservoir, putting nearby homes and villages at risks. A network of tunnels blasted beneath villages to channel the water underground to cities brings its own sets of risk and problems. The water is diverted from the natural spring sources which, ultimately, causes them to dry up. Tankers are brought in during the summer to supply water. In addition, visible cracks can be seen growing on the façade of houses. The constant blasting and re-channeling put their foundations in jeopardy. In the end, none of the promises made about the dam were carried through. While there was a potential for community employment assistance, only 31.55% of Tehri Dam workers are locals, mostly as menial laborers. The dam was supposed to produce

2,000 MW of electricity, but currently only produces less than half of that, 1,000 MW (*The Energy State and the Tragedy of Its Rivers* 25-26). This project has changed the landscape of the Ganga forever as well as the lives it took with it.

Sadly, the Tehri Dam is not the only development project along the Ganga causing suffering. The Maneri- Bhalli Hydroelectric Project was completed in 2008 and has affected at least 20 villages. These villages experienced diminished irrigation and watermill resources. A total of 75 families were forced to relocate. The agricultural land in the surrounding area was entitled by the government and used for project facilities. Sixteen families lost all of their land. No rehabilitation has been offered to those affected (*The Energy State and the Tragedy of Its Rivers* 27-28). While the true cost to these families' lives can never be measured, the environmental damage was obvious. Upon approaching the barrage, the flow of the river was completely stopped. According to government contracts, the electric company was not supposed to allow for the complete stoppage of the river, but clearly there is no regulation. At any point, the channel may be opened to release excess water. This sudden rise in water level can wipe away anything, and anyone, in its path. This hazard has caused numerous deaths along the banks (*The Energy State and the Tragedy of Its Rivers* 31).

An Uttarkhasi NGO, Himalayee Paryvaran Shiksha Sansthan, works to raise awareness about future hydroelectric power projects and protect the Ganga as a natural resource. One of HPSS's missions is to "bring together women, children, and the dalit sections of the society in the form and shape of a social organization (*Project Submission Under Nirmal Ganga Bhagidaari* 30)." Putting women at the forefront of campaigns is certainly a priority and has proven successful under their Jal Yatra and Raksha Sutra. The Jal Yatra, also known as Water March,

rose awareness about the effect of climate change on glacier melting, hydropower project destruction, and drinking water sources (*Water-March* 19). Raksha Sutra was a campaign against the timber industry which organized local women to perform a ceremony with the trees for their protection (*Project Submission Under Nirmal Ganga Bhagidaari* 31). These campaigns had such success because of their involvement with women. Similarly, the Chipko movement was revolutionary for its role in organizing the voices of women. When Sita was asked why the women were particularly passionate, she emphasized the power of just one voice, saying

“One woman spoke in the village, and she said mainly women speak because they are the ones who suffer. They are the ones doing the agriculture and are here when many men migrate elsewhere. That’s why they speak up. All the responsibilities to bring firewood, fodder, maintaining the fields, everything, it is on the women and the girls. So they take the major brunt of it.”

By speaking up, these women changed their roles in their communities. Not only did they shift environmental activism from the minds of upper-class men, they started a revolution. The legacy of the Chipko movement and efforts of HPSS go beyond the various dam and tunnel construction they impeded. The status of women has been elevated. In these communities, women set a precedent for self-governance. By holding their local town officials accountable, they were able to advocate for their best interests- protection of forests, water sources, animals, and agriculture. Their participation drew attention to these issues. In a study on women and water in India, the Garhwali women were praised for their “expertise on the boundaries for the use of natural resources (Shiva 79).” The study revealed a call to action to dismantle the hierarchy in so many local governments to provide freedom of information and inclusion in decision making by these educated women. The impact of this is witnessed in the Garhwal villages and could be monumental for other villages to adopt. The study concludes

with the unfortunate reality that “where the community organizations are strong, restrictions are imposed for the protection of the participant’s interest (Shiva 79).” These environmental tragedies are directly impeding the lives of women, and it’s those same women who have the voices to make a change.

Conclusion

Fulfilled Objectives

In conclusion, the project was successful in exploring themes that adversely affected Garhwali women in addition to understanding their attitudes about the Ganga. By noting patterns and connecting observations, several conclusions presented themselves most prominently. First off, the Ganga cannot just be taken at face value as a single body of water. She is thousands of tributaries, springs and streams. She is a spiritual goddess, worshipped and revered by Hindu religious texts. She is personified as a mother to all. It seems the Ganga has seeped its way into so many facets of Indian life. In that way, it is not easy to make sweeping generalizations about how women use Ganga waters. In the Kimsar region, it is clear that the Been River, a tributary of the Ganga, supplies drinking water to several regions at the source of a spring. This spring water is regarded to be one in the same with Ganga. Women spend countless hours collecting water and feeding cattle. In a spiritual sense, Ganga water is kept in homes across the region. This water is used in pujas and to purify other sources of water. By adding a few drops of Ganga water to a vessel, the entire vessel becomes Ganga. Sprinkling Ganga water on diseased plants is also believed to bring rejuvenating results. Perhaps the greatest testament to the belief of the Ganga’s purity is observed in that 19 of 20 women interviewed do not treat or filter their water before consumption.

While the study sought to make connections between spiritual reverence for the Ganga and its protection as a natural resource, there seems to be a shift in spirituality in these regions. Several women commented on their lack of thought toward the Ganga, noting that their lives were consumed by the responsibilities of maintaining a household in a rural village. Other women did refer to the Ganga as mother and express their desire for her to be clean, but the belief in Ganga water's unconditional purity appears to restrain action against polluters. While 16 of the 20 women acknowledged there was pollution, there were a few women who were particularly regretful about the river's condition. They noted that people do not practice what they preach, so to say, and go on polluting the river without acknowledging their harm.

This leads the researcher to question the apparent dilution of spirituality. While it cannot be concluded whether this is a result of the pollution of the Ganga or, inversely, the cause of it. One informant alluded to the increase of pilgrims in recent years to Gangotri and other holy cities as a sign of the rapid commercialization of religion. Pilgrimages, or yatras, are marketed as complete packages that almost anyone can attend or afford. The original pilgrims had to endure unpaved roads, long treks and other inconveniences. Only the most dedicated made the commitment. The accessibility of such a religious experience may be harming its truest intentions, especially considering the consequences of the increase of crowds and pollution.

Another question the study raised about spirituality with the Ganga was due to the inherent belief in her purity. An argument could be made that these women's consistent belief in the Ganga's pureness would encourage protective seeking behaviors. Yet, inversely, it appears that this concept relinquishes blame from individual polluters. It also instills a sense of

complacency with the current condition of water quality. If one believes the Ganga will always be clean, they do not see the harm in contributing a seemingly harmless additive.

The strongest advocacy against both the damming and pollution of the Ganga came from activists and NGO workers. This enforces the necessity for awareness about the effects of poor water quality and water diversion. Education can strengthen a movement, as proven with the Chipko movement. Women are especially essential in these roles because they face the largest deficits from receding water supply due to their household and agricultural responsibilities. Supporting of the voices of these women can ensure that the needs of the community are being adequately addressed, rather than corporate and governmental greed.

The government has focused efforts and schemes on developing areas around the Ganga, with both water diversion projects and road construction. Roads were perceived as both positive and negative additions to rural lifestyles of the women interviewed. They increased convenience in transportation to urban centers which expanded opportunities for markets places and education. In contrast, this accessibility also enables migration to these cities. Not only does this jeopardize local economies, but migrants face their own set of health problems. Water access in cities can be limited. Contrariwise, women in the Kimsar region have a constant source of water, from the spring, which may contribute to their perception that village life as healthier.

Overall, this study can conclude that a singular source of water or isolated religious belief cannot define these complex interactions. Just as women's water use is not confined to drinking, but rather also bathing, washing, feeding cattle, irrigation and, sometimes, financial

gain, the Ganga does not just have one presence. This study attempted to interpret the intricacies of water, religion and development and it appears they do not intersect at simply one point. Beyond all else, one sentiment stood as a testament to the importance of this study and future action, "Water is life."

Answer to research questions

Women use the springs of the Ganga for drinking, bathing, cattle and washing water. Alternative sources of water in the studied regions include minimal tap water, hand pumps and roof water harvesting tanks installed by Himalaya Seva Sangh. All of the households involved in the study kept Ganga water for puja. Majority of women had knowledge of pollution of the Ganga. Several women expressed explicit desire for the river to be cleaned. Several women expressed regret due to the damming of the Ganga. One women approved of the hydroelectric products for their production of electricity.

Water diversion projects cause massive amount of physical damage to the Ganga and irreplaceable damage to the lives of displaced families. Industries contribute majority of pollution to the Ganga.

Women with knowledge of destruction by dams, barrages and bridges, articulated opposition to these projects. The success of the Chipko movement was due to the involvement of women protesters. Awareness campaigns continue to draw attention to these matters.

Further research

The relationship between the understood purity of the Ganga and pollution can further be studied to determine cause and effect. More specific health concerns of the hydroelectric

projects as well as possible alternatives should be detailed to lessen their effect on women and families. More exact measurements of water quality at various sources along the river can also give more context to any project working on the Ganga. By increasing the sample size of interviewees, more precise conclusions can be ascertained.

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