FEMALE LIVELIHOODS AND PERCEIVED RISKS NEAR THE BETWA RIVER

A minor field study in Mandideep, Madhya Pradesh, India

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Bachelor's essay 15 credits
Development and International Cooperation | Fall semester 2018
ABSTRACT

There is enough freshwater on the planet to ensure clean and accessible water for every human being. Despite this fact, water scarcity is a global problem affecting the livelihoods of people everywhere. This paradox can be seen in India. The country has a vast source of water through their many rivers and lakes. Nevertheless, it battles with issues regarding water scarcity and sanitation. Groundwater and rivers are polluted to a high extent and known contaminators are both human waste and industrial effluents. In Mandideep municipality, located in Madhya Pradesh, India, industrial effluents and sewage waste is dumped into the Betwa river which is heavily polluted as a result. These premises lay the foundation for this minor field study which looks at women’s wellbeing and capabilities through the lens of ecofeminism and the sustainable livelihood approach. Four villages, in close proximity to the river, are subject of investigation with the aim to understand the female perception of the Betwa river and whether the water quality impacts women’s livelihood strategies or not. During the field study, 21 women in these villages have been interviewed. The study concludes that the women’s possibilities are directly connected to environmental wellbeing where the continued undermining of natural resources reduces their capability to obtain sustainable livelihoods. The level of interaction with the river depends on the geographic position of the villages and its proximity to industrial belt of Mandideep.

KEYWORDS

Betwa River; Ecofeminism; Environmental accountability; Sanitation; Sustainable livelihoods; Water safety
ACKNOWLEDGMENTS

We would sincerely like to thank everyone that made this thesis possible. Special thanks to the participating women, without your input and interviews this thesis would not be realised. We would also like to thank Jagran Lakecity University for the hospitality and Dr. Diwakar Shukla, our mentor in Bhopal, India, for the extraordinary help with logistics and contextual input. All of the committed people at the National Institute of Women, Child and Youth Development, especially Mr. Sunil Gawande for his local expertise and interpreting skills. Finally, we want to thank our supervisor Dr. Clas Lindberg for his academic guidance throughout the years.

Sincerely,

Tove Julin & Christine Persson
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<thead>
<tr>
<th>Acronym</th>
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<tbody>
<tr>
<td>NGO</td>
<td>Non-Governmental Organisation</td>
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<tr>
<td>NIWCYD</td>
<td>National Institute of Women, Child and Youth Development</td>
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<td>NRDWP</td>
<td>National Rural Drinking Water Program</td>
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<td>OBC</td>
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<td>SDG</td>
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<td>ST</td>
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1 INTRODUCTION

Chapter 1 is divided into four sections. It starts out with a brief summary of the global problem of water scarcity, pollution of rivers and surface water. This is followed by a brief section on the Betwa river and the 1984 Bhopal gas tragedy in an attempt to frame the topics highlighted in the thesis. Later we will lay out the purpose and research questions in section 1.2 and 1.3, and lastly, the method used for data collection is accounted for.

1.1 BACKGROUND

According to the United Nations (UN) Sustainable Development Goal (SDG) 6, there is enough freshwater on this planet to ensure clean and accessible water for every human being (UN n.d). Nevertheless, water scarcity is still a global problem (United Nations World Water Assessment Programme [UN WWAP] 2017:10-11). When economic development and populations increase, the problems of water scarcity will intensify in water-stressed countries, for example in Asia and the Pacific region (United Nations Economic and Social Commission for Asia and the Pacific 2014:21). In a report from UN WWAP (2017) it is stated that two thirds of the world's population live in areas that experience water scarcity for at least one month a year. 50 percent of these people live in China and India. Further, the report state that freshwater as a resource in the Asian and Pacific region is overall limited and the region is experiencing increased rivalry across key sectors. At the same time it is estimated that 80–90 percent of all wastewater produced in the region is released untreated, a big cause of pollution of ground- and surface water resources (UN WWAP 2017:10-11, 97).

According to Wate (2012:265), India has a vast network of rivers and is in itself rich in water resources. But due to a rapidly increasing population and increased demands on human and industrial consumption, where existing resources are being depleted and water quality is degrading, the country experiences water scarcity (Wate 2012:265). Kulshrestha et al. (2017) and Mandloi (2014) say that the main drinking water sources in the country are running rivers and lakes. This even though most of the cities in India have experienced a rapid development, the development of waste disposal plans has not kept the same pace. This has resulted in waste and industrial effluents being disposed directly into water sources like rivers, lakes and reservoirs (Kulshrestha et al. 2017:169-170; Mandloi 2014:144). On top of this, Wate (2012) argues that groundwater sources in the country are depleting at a concerningly high rate even though it is an important water body where around 85 percent of the rural population depends on it. India utilise a great amount of rainwater, mainly collected during the monsoon. But this is evidently not enough to sustain the growing need of safe water nationally. In many parts of the country, drinking water is scarcer and in some areas even unavailable, during the dry season. Around ten percent of the population lack access to safe water sources and therefore many of them depend on unsafe sources (Wate 2012:265-267). In the state Madhya Pradesh, located in central India, the Betwa River is an important water source where pollution is highly evident (Kulshrestha et al. 2017:169-170). The river originates from the village of Jhiri and flows
through the industrial belt of Mandideep, 32 km from state capital Bhopal, where the main cause of pollution of the river Betwa is industrial effluents but water quality is also seriously affected by sewage discharge (Kamyotra et al. 2016:24). Groundwater in Mandideep is highly contaminated which has negative health impacts on the people living in the region (Mandloi 2014:144, 146). This lays the foundation for this study. To understand the female perception and interaction with Betwa and how the river impacts livelihood strategies, interviews with women residing in four different villages alongside the river Betwa has been conducted.

![Figure 1: Map of location of Madhya Pradesh](source: See table 1)

Insufficient access to clean water and sanitation have a negative impact on people’s capabilities and wellbeing which inhibits sustainable development (UN 2015:18). Gaard (2015) argue for the importance of looking at women’s possibilities and capabilities in maintaining a
sustainable livelihood strategy in the attempt to empower women. Women face an additional threat from climate change and natural disasters due to their already reduced capabilities, as a result of inequalities enforced through gender roles, poverty and discrimination (Gaard 2015:23). When looking at forms of discrimination within the Indian context, Bapuji and Crispal (2017) explain that the caste system plays an important role. Caste limits the social interaction between individuals and groups which in turn limits the fulfilment of human functions (Bapuji & Chrispal 2017:3). When looking at water’s effect on individuals it is important to bare these discriminations in mind. Using ecofeminism as a part of the analytic framework the SDG’s are a relevant aspect. Mainly, this concerns SDG 5 on gender equality and 6 regarding clean water and sanitation (UN 2015:18). But since a big reason to why the Betwa river is polluted is due to industries dumping their discharge in the river, goal 12 regarding responsible consumption and production is also of concern. For example, as is said in Agenda 2030 (UN 2015), target 12.4 aims to minimize the impact of chemicals and waste in human health and environment by achieving a sound environmental management in line with international frameworks, and to reduce releases into air, water and soil. SDG 5 regards the ending of all forms of discrimination towards women and girls in the world (Ibid 2015:18,22). Further, which is stated by UN Women (n.d.), the agenda attempts to strengthen women's economic position and one way of tackling the uneven distribution of workload. A big part of the workload executed by women involve unpaid domestic work and care which leads to less time for paid work, weakening women's economic position (UN Women n.d). This is why it is interesting to look at different livelihood strategies. To be able to do so, the Sustainable Livelihood Approach (SLA) works as the second pillar of the theoretical framework. SDG 6 is of high relevance since, as claimed in the Agenda 2030, it targets issues such as adequate and safe water access as well as sanitation and hygiene for all. Further it comments on the problems with pollution of waters and the release of hazardous effluents (UN 2015:18).

Madhya Pradesh has already suffered a tremendous tragedy involving a multinational industry. In December 1984, what is known as the Bhopal gas leak occurred, one of the largest chemical industrial accidents in history (Eckerman 2005:213). The gas leak took place at Union Carbide India Limited (UCIL) pesticide manufacturing plant in Bhopal, state capital of Madhya Pradesh, a subsidiary of the US based multinational Union Carbide Corporation (UCC) where UCC owned a majority of the company (Odysseos 2015:1043). UCC denies responsibility and have continuously tried to pin it on different branches of the corporation such as UCIL even though UCC claimed ownership and was aware of the “ultra-hazardous substances” that was produced and stored in bulk at the plant (Amnesty International 2004). Amnesty International (2004) estimated that 40 tonnes of highly toxic methyl isocyanate and other gases leaked out from the plant polluting the environment and contaminating water important to surrounding communities. Whole neighbourhoods adjacent to the plant died when they could not outrun the toxic clouds. The number of reported victims varies, but between 3 000 (Odysseos 2015:1043) and 7 000 (Amnesty International 2004:1) were estimated dead within the first week, 20 000 died as a direct outcome of the leak (Odysseos 2015) and around 100 000 to 520 000 people were exposed to the gas and suffer permanent damage (Eckerman 2005:213). The numbers of victims are, to this day, growing (Amnesty International 2004:1; Eckerman 2005:213; Odysseos 2015:1043). Chemicals are still seeping down into soil and groundwater, spreading
the effects of the gas accident to areas further away from the disaster nexus (Joshi & Ballal 2011:11). According to Amnesty International (2004) and Eckerman (2005), the first legal conviction came 26 years after the accident and no one has yet to be convicted for the ongoing water pollution. The gas tragedy has had a lot of health consequences; underdeveloped children, inhibited physical development, skin diseases etc. More than 30 years after the accident it continues to affect the health of the population. The primary population in the area mainly constitutes of Muslim families and lower castes. The accident has become a symbol for transnational corporation’s neglect of human life and it has raised questions about corporate responsibility towards the local environment as well as human lives. UCC, much like other companies involved in industrial accidents around the world, have failed to acknowledge their role in the accident and the health outcomes (Amnesty International 2004; Eckerman 2005:213).

1.2 PURPOSE

The aim of the thesis is to investigate how access to, or lack of, water and sanitation affects women’s livelihoods. As stated in the introduction, people without sufficient access to safe water sources will turn to unsafe water practices. Based on this, the Betwa river's impact on the female day-to-day-life is examined in order to understand their livelihood strategies and sanitation routine. A further motive is to look at what knowledge women residing near the river have in regards to hazards related to polluted water and to what extent they are dependent on the river. In order to grasp the setting of the thesis, one has to understand the significance of water quality and safety as well as the social setting of the villages around Mandideep.

1.3 RESEARCH QUESTION

- How do different livelihood strategies create different exposure to river related hazards for women?
- Are there geographical differences in how women are affected by the Betwa river and how they perceive the hazards?

1.4 METHOD

Since the aim is to explore how women’s livelihood strategies are affected by the polluted Betwa river and whether they depend on the river or not, the method for the study is mainly comprised of semi-structured interviews with women connected to the river. Respondents chosen for interviews have been mediated with the help of the NGO National Institute of Women, Child and Youth Development (NIWCYD) that works with empowering women, children and adolescent girls in the area. An interpreter has been present since the interviewed women speak Hindi and the authors do not. The thesis is complemented with secondary sources from previous research as well as observations and other types of personal communication. The

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1 Personal communication, Interview, Sunil Gawande, National Institution for Women and Child Development, NIWCYD, 2018-12-03.
qualitative data collected has been recorded and later transcribed to help with reliability and validity when analysing the interviews (Mikkelsen 2005:179). Collected data has thereafter been analysed inductively through the theoretical framework of Ecofeminism and SLA in chapter 6. A more extensive review of the methodology for the study can be found in chapter 4.

2 THEORETICAL FRAMEWORK

The theoretical frame that this thesis works within consists of two theories, Political Ecofeminism and the Sustainable Livelihoods Approach. This chapter starts out with an introduction of ecofeminism and intersectionality, followed by SLA.

2.1 ECOFEMINISM

The fundamental concept of ecofeminism is the notion of a correlation between the exploitation of nature by mankind and the oppression of women by men (Gaard 2015:23-25; Goebel 2003:81; Mies & Shiva 1993:16; Peet & Hartwick 2015:300; Torpman 2017). However, ecofeminism is not a unified field and has various definitions and interpretations. On one hand, there is cultural or spiritual ecofeminism and on the other, political ecofeminism (Mies & Shiva 1993:16). Authors such as Merchant (1994), Mies and Shiva (1993) argue that spiritual ecofeminism emphasizes the female connection to nature, reconstructed in gender roles and biological structures. This bound is especially associated with women in the global South. Through political and social practices, both nature and women are objectified, owned and controlled. The oppression of nature is caused by the same mechanism that oppress women, the patriarchy. Liberation of one is dependent on the other (Merchant 1994:17; Mies & Shiva 1993:14). The conviction of a biological bound between women and nature is highly criticized by scholars aligning under political ecofeminism, accusing spiritual ecofeminism for consolidating a stereotypical female role and thereby subordination (Torpman 2017). In this study, the political intersectional orientation is used.

2.1.1 POLITICAL ECOFEMINISM

Authors like Gaard (2015: 23-25) and Goebel (2003:81) explain the inequalities between the sexes as socially constructed, not biologically determined. Gaard (2015:23-24) speaks of how consequences of climate change and natural disasters affect women to a much higher extent than men as a result of inequalities enforced through gender roles, poverty and discrimination. However, this vulnerability is not distributed evenly between the global female population but affects poor women more severely. The global workload is gendered and unevenly distributed with two thirds of the world’s working hours executed by women. A majority of these hours are dedicated to household duties and or caring responsibilities, and does not generate income. The female workload traditionally involves food production, water fetching or collecting fuel and fodder. This puts women in direct contact with nature and thus ecological disasters and
climate change. The extent of the workload is not in correlation with women's economic position, 70 percent of the world's poorest people are women. The economic power, or lack of, for marginalized people prohibits them from taking action and postpone the impacts of climate change like economic or cultural elites are able to (Ibid 2015:23-24).

As stated by Goebel (2003), political ecofeminism, or feminist political ecology, consider gender as part of a value system that is produced as a result of ecologically based struggles, as well as through economic relations and cultural and/or social institutions. The field views the environment as part of the total social system that shapes human life and not primarily as a natural resource for humans to exploit. In order to grasp the depth of the environmental crisis, additional layers of gender relations need to be unveiled by analysing human-environmental relations in specific cultural and social contexts. Goebel (2003:81) refers to Marx’s dialectic view on man and nature in regards to this phenomenon. This is further explained by Foster in his metabolic rift theory\(^2\) (Warlenius 2017:50-51). Plumwood (1993:14) phrase this as a manifestation of societies hierarchical system reflected in ecological degradation. Other authors, such as Gaard (2015) and Goebel (2003) writes that domination of nature generates wealth and power to already powerful elites, deepening the gap between them and socially weak groups without market power, including non-humans. When highlighting problems with globalisation and colonisation, as well as when examining local environmental management and the gendered spatial patterns affecting women’s mobility, knowledge and power - one can see how the field of spiritual ecofeminism differs from political ecofeminism or feminist political ecology (Gaard 2015:22; Goebel 2003:80). Goebel (2003) further argues that women’s relationship with their environment is complex, determined by social contexts and hierarchies. These context specific prerequisites make it difficult to generalise the woman-nature relationship. It is therefore of utmost importance to have an understanding of the historical setting when determining how natural sources are distributed, both on a micro and macro level, and how it affects women in the local context (Goebel 2003:79-80).

Gaard (2011;2015) and Torpman (2017) explains that political ecofeminism has been strengthened by queer theory which opens up the discussion for all non-male oppression and deepens the understanding of the correlation between different causes of oppression in an intersectional perspective. When analysing ecological injustices, such as water pollution and scarcity, it is crucial to use an intersectional ecofeminism that incorporates oppression caused not only by gender discrimination but also class, race, species, sexuality, ability, age and nation (Gaard 2011:44; 2015:24; Torpman 2017). Depending on the context, caste is also an important factor that determine the outcome for the individual (Grünenfelder & Schurr 2015:777).

2.1.2 INTERSECTIONALITY

To understand the complexity of oppression, Molina (2016) argues for the importance of intersectionality. It derives from postcolonial feminism and its objective is to reveal different

\(^2\) Marx speaks of labour as a process between man and nature, where man - through his actions impinge the metabolism between nature and humans (Warlenius 2017:50-51). Foster developed the metabolic rift theory from Marx understanding of ecological disruption (Foster 1999:379-80). Global capitalism has an inbuilt social metabolic system (attitude or approach to nature) which creates ecological rifts in the underlying metabolic relation between humankind and earth and even within nature itself (Warlenius 2017:55).
oppressive forces that shapes power structures while discriminating on the basis of ethnicity, class and sexual orientation. It is not possible to analyse gender without looking at the social and cultural contexts (Molina 2016:34). Crenshaw (1991) introduced the concept of intersectionality when she explained the problem women in social justice groups face, not only being discriminated because of their racial belonging but also because of their gender (Crenshaw 1991:1242; Grünenfelder & Schurr 2015:772). Crenshaw (1991:1242) highlights the difficulty of identity politics if it is seen as a one-dimensional problem. The experience of violence, for example, is not only linked to one part of the victim’s identity, such as gender, but also shaped by dimensions such as race and class (Ibid). Grünenfelder & Schurr (2015) mean that intersectionality has become an important part of development work after years of gender mainstreaming. People in charge of policy and practise are accountable for acknowledging different groups or identities and not only see to one social dimension (Grünenfelder & Schurr 2015:773). Not recognising, or even ignoring differences within a group tends to create tension within it, resulting in further marginalisation for individuals identifying with a variety of social belongings (Crenshaw 1991:1242-1244). As argued by Grünenfelder and Schurr (2015), some common categories of identity are possible to label and account for in development work and analysis, such as gender, class and race, while other aspects are less obvious without further insight, such as illiteracy. Being attentive to power structures and acknowledging how the discourse silences and obscures certain identities in order to serve other groups is key when unveiling marginalised identities (Grünenfelder & Schurr 2015:774-775).

Plumwood (1993:14) emphasises the link between control and exploitation over nature and humans. High technological agriculture and forestry for example, often executed in the global South governed over by forces of the North, is not only ecologically intense and insensitive but also strengthens the position of elites. Thus, cementing their role through manifesting social injustices, for example by increasing men’s control over women by securing their economic position (Ibid). Regarding environmental degradation, Gaard (2001;2011) highlights several dimensions of oppression, more known as environmental racism, environmental sexism and environmental classism. In the expression of the environmental forms of sexism/racism/classism, it is not only nature that is being oppressed, but nature is also used as a tool to diminish weak human populations. These three forms of discrimination intersect at various points, the form of oppression follows the same linear course even though they originate from different social injustices. Looking at a phenomenon such as toxic waste disposal and the conflicts that arise from it, one can see these patterns. Toxic waste disposal and polluting industries are often established in economically and socially disadvantaged communities. Hence, subjecting the population to life-threatening toxins that wealthier communities would not allow in their backyard. At the same time, wealthier communities reap the benefits from this pollution (Gaard 2001:159-160; 166-168; 2011:31). In the context of this study it is important to also incorporate the caste system in the intersectional outlook since it has great significance for social structures in India.
2.2 THE SUSTAINABLE LIVELIHOODS APPROACH

The Sustainable Livelihoods Approach was first introduced by the Brundtland Commission in 1987 where the extensively used definition of sustainable development was coined:

“Sustainable development is 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

Sustainable development relies on three pillars of wellbeing; social, environmental and economical (Morse & McNamara 2013:6). The widely used term, sustainability, has according to authors such as Morse and McNamara (2013), received criticism on the global arena. There is a tendency to neglect the social and environmental dimensions as long as the economic one is strong. This despite the fact that long term prosperity depends on all three pillars of wellbeing. A comprehensive approach to sustainability, that take into account the three pillars equally, is often hard to apply on an individual level since it does not reflect day-to-day life. Sustainability is often associated with restraints and not prosperity. The willingness to incorporate an environmental and social consciousness in policy and everyday life is not always there, since survival, for many, has to be maintained on a daily basis which does not make the future a possible priority. One way to make sustainability more approachable is by using the anthropocentric term; livelihoods. Sustainable livelihoods provides resources so that people can enhance and enjoy their life rather than just survive. When putting this into practise, the sustainable livelihood approach works as a functional analytic framework and tool (Morse & McNamara 2013:3-4).

SLA came in an attempt to widen the definitions and approaches in combating poverty, this because previous definitions and approaches only focused on certain aspects of poverty and did not take into account all variables known to affect people’s living situations today (Morse & McNamara 2013:6). SLA focuses more on how to enhance people’s ability to live economically, ecologically and socially sustainable lives (Ibid). Since the Brundtland Commission, SLA has been expanded during the 1992 UN Conference on Environment and Development where it was argued that the approach should be implemented in poverty reduction (Krantz 2001:6). The definition of sustainable livelihoods has since been modified by Scoones for the Institute for Development Studies (1998:5):

“A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks, maintain or enhance its capabilities and assets, while not undermining the natural resource base.” - Scoones 1998

Scoones (1998) strives to define a framework for a holistic perspective on livelihoods of the poor, including their social and human capital, not just physical and natural resources. It is important to look at all aspects of the individual’s setting. When it comes to social and human capital, capability and wellbeing are of utmost importance since they determine the individual’s
resilience to shock and stress. By using the terms capability and wellbeing it allows people to define their own criteria for a sustainable livelihood. It is at the same time imperative to look at natural resources due to the fact that many livelihoods depend on the resource base in the area (Scoones 1998:1,6,13). Scoones further discuss a number of variables which are critical to pay attention to when looking at livelihood compositions; age, caste, gender, income differences, religion, social/political status etc. These all contribute to a broader understanding of contextual factors. To understand specific outcomes in each unique context, Scoones stress the importance of looking at what different combinations of livelihood resources result in which combinations of livelihood strategies. Often these are complex and dynamic and are part of the key to identify required resources for different livelihood strategies. Further, unlike most applications of SLA, Scoones does not only focus on the aspects of poverty and SLA as a poverty reduction tool. Indeed, he mentions poverty reduction as central to enable capabilities and wellbeing, but along with environmental management and rural development. The sustainable livelihoods approach as interpreted by Scoones can be applied at different scales, everything from individual and household outcomes to village, region or even nation outcomes can be analysed with the framework. It should be stressed that the term sustainable livelihoods are subject to negotiation, since people have different views on what constitutes a sustainable livelihood (Ibid 1998:3,5,7,9,11).

SLA is well equipped to form action plans on institutional levels due to its ability to identify the institutional matrix that determines priorities between different capital (Scoones 1998:13). In this research, however, the institutional dimension is not the main focus. We acknowledge the importance of the institutional setting but the aim here is to look at the female perception in field rather than formulating an action plan or policy. The SLA used in the study is mainly based on a holistic view on livelihoods, presented by both Krantz and Scoones, incorporating more aspects than just income, such as wellbeing.

3 SOCIAL AND ENVIRONMENTAL CONTEXTS

The following chapter presents previous research and works as a literature review to be able to understand the context of this specific setting. This is necessary in order to better comprehend and analyse the results of the empirical findings. It is divided in four sections: first a brief review of the caste system is given, followed by a global and more general view of water safety and water pollution; Thirdly the impact of water and water safety for women is investigated and lastly more details of the Betwa river are revealed.

3.1 INDIA’S CASTE SYSTEM

In India, the caste system greatly influences, or even determines, the social and economic interactions between individuals (Bapuji & Chrispal 2018:3). Even though discrimination of castes has been banned by the Government of India it is still practised and continues to shape people's capabilities and identity (ibid). Bapuji and Chrispal (2018), Jodhka (2016) and Stroope
(2012) explain caste as being built on the Brahminical model, where Brahma, the Hindu God of creation, made humans out of four different parts of his body. From his head/mouth the Brahmins were created; making them top caste fit to be priests or scholars, from his arms the Kshatriyas; political leaders and warriors, from his thighs the Vaishyas; merchants and traders, and from his feet the Sudras were made; artisans, labourers and servants. This is the foundation of the social hierarchical system. Brahmins, Kshatriyas and Vaishyas are at the top of the caste system and seen as ‘upper castes’ or ‘forward castes’. The Sudras are known as ‘other backward castes’ (OBC). However, there are more categories which are not part of Brahma. One is the untouchables or Dalits, also known as the ‘scheduled castes’ (SC). Dalits refer to those outside of the system, seen as polluted and unclean (Bapuji & Chrispal 2018:4-5; Jodhka 2016:229; Stroope 2012:504). Bapuji and Chrispal (2018) also discuss another category, the indigenous tribal groups, called Adivasi, otherwise known as ‘scheduled tribes’ (ST). Dalits and the Adivasis are part of the ‘lower castes’. Within these main categories, there are thousands of subgroups. The upper castes constitute approximately 31 percent of the Indian population, the Sudras 40 percent, the Dalits 20 percent of the population and Adivasis around 9 percent of the population (Bapuji & Chrispal 2018:4-5). As already mentioned, the caste system influence people’s social position. First of all, by placing them in a hierarchical system, but also by restricting their mobility in terms of moving between castes, particularly their upward mobility (Bapuji & Chrispal 2018:4; Jodhka 2016:237). Actions in one’s previous life is believed to determine which caste one will belong to in the next which Bapuji and Chrispal (2018) explain is why an individual’s belonging is inherited from birth. The caste system has been pervaded to Buddhism, Christianity and Islam. The social position is further restricted by the caste setting where house construction regulations are allocated so that people of various castes live in the same areas. Hence, interaction between different castes is minimized and people’s capabilities to social mobility decreases (Bapuji & Chrispal 2018:4-5).

As discussed by Bapuji and Chrispal (2018), the Indian caste system is very complex, and there is no general way of describing the entire system. It differs between states and regions. But what has been mentioned above are all distinctions of the caste system which are important to understand in order to get a grasp of the ongoing unequal social hierarchies in the country (Bapuji & Chrispal 2018:4-5). Caste together with class, ethnicity, gender, and/or religion form structures of power on a local as well as global level where social and environmental inequalities are closely intervened with access and distribution of water (Naz 2015:89). Water has traditionally been a tool to exclude both women and lower castes, this can for example be seen in practises where menstruating women and Dalits are banned from collecting fresh water in villages, in fear of them polluting the source (Krishnaraj 2011:38).

3.2 WATER SAFETY AND SANITATION

Lack of safe water access and insufficient sanitation are among the most serious health problems globally (Meade & Emch 2010:262). Authors such as Kulshrestha et al. (2017), Landrigan (2018) and Mandloi (2014) has concluded that water is one of the most exploited natural systems today where pollution of water is steadily increasing. There are several reasons for this, the main contributors being rapid population growth, urbanisation, industrialisation
and chemical use in agriculture worldwide (Kulshrestha et al. 2017:169; Landrigan et al. 2018:1; Mandloi 2014:144). Industrial wastewater often contains several toxic agents, like chemicals, where it is enough with a small amount to contaminate a large volume of water (UN WWAP 2017:39). Polluted water is not only an environmental issue but also a social and economic one (Landrigan et al. 2018:1). Contaminated water is a major source of water transmitted diseases in less developed countries (Brick et al. 2004:473) and areas with poor sanitation and wastewater services generally have a widespread problem with related diseases (UN WWAP 2017:39-40). Waterborne diseases are, according to Pathak (2015), transmitted by drinking, bathing, preparing food in, or in contact with contaminated water and lack of sanitary options. They are most frequent during summer and rainy seasons due to an abundance of water making it difficult to manage it effectively. This leads to water accumulation which becomes a hotbed for water borne diseases (Pathak 2015:74-75). Human sewage and waste are known contaminators of groundwater causing severe health outcomes for humans and other lifeforms (Wallender et al. 2013). Brick et al. (2004) has observed how infrequent accessibility of water in many developing countries often leads to people storing water for later use. Storage of water in households is connected to increased levels of contamination, were the severity of it depends on how and where it is stored and how it is managed. People who store water generally use it for bathing, drinking, food preparation and washing. Countries with dry and rainy seasons often require prolonged household storage of water during the dry season (Brick et al. 2004:473-474). As argued by Meade and Emch (2010), households not connected to indoor piping often get their water from overcrowded and/or communal standpipes at remote locations. These are either private vendors, often expensive and/or heavily polluted, or hand-dug, shallow wells. Borehole technology is becoming increasingly adopted in developing countries as a source of uncontaminated water (Meade & Emch 2010:261-263).

In 2008, it was estimated that 10 percent of the total global burden of disease was caused by unsafe water sources, poor sanitation and hygiene (Pathak 2015:74; Pruüss-Üstün et al. 2008:7). The World Health Organization (WHO) reported in 2018 that 159 million people depend on surface water while 430 million people rely on water from unprotected sources (World Health Organization [WHO] 2018). Meade and Emch (2010) categorise unsafe water sources for drinking as; surface water such as rivers, dams, and streams; unprotected wells and springs; bottled water; vendor-provided water and water from trucks. Poor and unimproved sanitation qualifies as public or shared latrines, open pit latrines or bucket latrines. In order for households to improve water safety, they need connection to a water supply, either a public standpipe, a protected dug well, borehole, a protected spring or a spring water collection. For safe and improved sanitation, connection to a public sewer, a septic system, pour-flush latrine, a simple pit latrine or a ventilated pit latrine is necessary (Meade & Emch 2010:262). The health risks that insufficient access to water and sanitation resources pose have gained more recognition globally in recent years (Sahoo et al. 2015:81). But even though global efforts are being made with the Millennium Development Goals and later Agenda 2030, 2.5 billion people still lack access to sufficient sanitation services and around 1 billion people practice open defecation (Sahoo et al. 2015:80). WHO estimate that at least 2 billion people are dependent on drinking water from a source that is contaminated with faeces (WHO 2018). 70 percent of India’s surface water resources are contaminated by different pollutant materia (Pathak 2015:74).
3.3 Women and Water: Safety and Sanitation

Lacking access to safe water affects women globally (Gaard 2015:23; Sorenson et al. 2011:1523). Water is interrelated with gender, class and religion (Truelove 2011:143). Providing the household with water is generally considered a female task and is often time consuming (Gaard 2015:23; Sorenson et al. 2011:1523). This is an example of the universal patriarchy and cements symbolic and structural inequalities between women and men (Krishnaraj 2011:38). Women generally experience a greater struggle than men in providing their daily need of water, sanitation and hygiene resources which may result in unsafe practices (Baker et al. 2017:1-2). To manage the insufficient water supply, people take to various practices like collecting water from informal and illegal sources, reverting from work to find water and walking long distances to perform sanitary needs (Truelove 2011:143). Mangubhai and Capraro (2015) talks of how women belonging to the Dalit castes face both gender and caste inequalities regarding access to and command over resources and services and also over public and cultural spaces. Untouchability discrimination can be seen in the practice of water fetching, an activity traditionally assigned to women (Mangubhai & Capraro 2015:264-265).

It is well known that lack of sanitation for women affect their health status as well as inflicting psychosocial stress (Kulkarni et al. 2017:170, Sahoo et al. 2015:81). Some of the health risks women face are chronic constipation, increased maternal mortality risk, poor infection control, urinary incontinence and urinary tract infections (Sahoo et al. 2015:81). Kulkarni et al. (2017) has discussed how these effects are particularly distinct in poor and overcrowded areas where the lack of sanitation imposes physical insecurity, including assault, harassment and rape. Nevertheless, when planning sanitation systems, full understanding of the role of gender and other aspects of identity that hinders people from accessing sanitation is poor. Women lacking adequate access to either individual household latrines or public community toilets are constrained in a number of ways deepening gender inequalities. Public community toilets are generally seen as the answer to inadequate sanitation in areas where households are short of individual latrines. Often, these stand unused due to them not being well planned, which poses gendered hazards for women. Many women rather take the risk of fulfilling their needs out in the open. To get some kind of privacy they often turn to unsafe environments in search of hidden and isolated places (Kulkarni et al. 2017:169-170).

3.4 Water and Sanitation Policies in India

India has been eager in adapting the SDG’s in their national development goals (United Nations High Level Political Forum [UN HLPF] 2017:v). The country has stated that they play a key role for the global success of Agenda 2030 (United Nations India n.d). In 2017, according to the UN HLPF, goals 1, 2, 3, 5, 9, 14 and 17 were in focus. The means to achieve the goals, focusing on poverty reduction and social inclusion, are economic growth and industrialisation. To implement the SDGs, several programmes have been launched (UN HLPF 2017:v-vi). Here the schemes involving water and sanitation will be examined. The Government of India has one ministry for the overall policy, planning and coordination, the Ministry of Drinking Water and Sanitation (n.d.), in charge of their two programmes on water and sanitation: The National
Rural Drinking Water Programme (NRDWP) and the Swachh Bharat Mission. The NRDWP aims to provide everyone in the country’s rural areas with a sustainable supply of safe water for consumption, cooking and other domestic fundamental needs (Ministry of Drinking Water and Sanitation n.d.). In the government's basic principles, they claim the responsibility of ensuring that people have access to safe water at all times and in all situations. The government sees it as an urgent issue which should be given highest priority, in order to increase economic productivity and public health (Department of Drinking Water Supply 2010:1). The ministry also clarify that they mainly focus on building infrastructure in combating water scarcity (Ministry of Drinking Water and Sanitation n.d.). The Government of India define safe water as:

“free from biological contamination (guinea worm, cholera, typhoid etc.) and within permissible limits of chemical contamination (excess fluoride, brackishness, iron, arsenic, nitrates, etc.)” - Department of Drinking Water Supply 2010:39

According to Godfrey et al. (2011), the Government of India says water coverage in Madhya Pradesh is 60 percent. However, the government does not consider the quality or safety of the water in these estimates (Godfrey et al. 2011:561-562). In India in general, chemicals released into groundwaters are increasing due to over-extraction and chemical contaminants pose a very serious health risk (Wate 2012:267). Groundwater in Mandideep is seriously contaminated and in order to prevent a negative health impact on the people living in the region, corrective programs to control levels of heavy metals should increase (Mandloi 2014:146). When it comes to the Swachh Bharat Mission, the Ministry of Drinking Water and Sanitation (n.d.) claim their aim is to accelerate efforts in reaching safe national sanitation coverage. This include improving the cleanliness levels by making the countryside free from open defecation, meaning no visible faeces in the villages. Everyone is to use safe technology options for disposal of solid and liquid waste (Ministry of Drinking Water and Sanitation n.d.). They argue that it is crucial to understand who the stakeholders are and what impact poor sanitation has (Godfrey et al. 2011:561). According to Sahoo et al. (2015), two thirds of the population in India live without improved sanitation systems and around 600 million practice open defecation. As mentioned earlier, 1 billion people globally defecate outside, meaning that India represents 60 percent of the global population (Sahoo et al. 2015:80).

3.5 THE BETWA RIVER

The Betwa river originates from Jhiri in Mandideep municipality, Raisen district of Madhya Pradesh (Vishwakarma et al. 2013:218) and conjoin with Yamuna river near Hamirpur district of Uttar Pradesh (Kori et al. 2006:148; Kulshrestha et al. 2017:169). One of the rivers eight tributaries is the Kaliyasot river, which also flows through the Raisen district (Kori et al. 2006:148). In earlier times, rivers and streams has worked as self-purifiers of pollution from waste, but as the waste discharge has increased, the self-purification process has reduced, causing pollution to reach hazardous levels (Ibid). In the Central Pollution Control Boards annual report 2015/2016, the water quality of Betwa has been found severely polluted from Mandideep area up to Bhopal. Betwa flows through the industrial belt of Mandideep, with
mainly plastic, rubber and chemical electro-graphite dye industries, which contributes to a major discharge of industrial effluents and sewage. The pollution is recorded starting from Mandideep which is due to no discharge reaching the river before this point (Kamyotra et al. 2016:24). The produced waste contains toxic heavy metals, harmful organic and inorganic sewage which contaminate the regions groundwater (Kulshrestha et al. 2017:169; Mandloi 2014:144,146). Other known contaminants are, as argued by Kori et al. (2006) and Kulshrestha et al. (2017), domestic waste and sewage from Mandideep and Bhopal city, joining Betwa through the Kaliyasot river. The combination of these pollutants is severely harmful for human health (Kori et al. 2006:147-148; Kulshrestha et al. 2017:180). The river has also become shallow in many areas of the riverbed which makes the area unfit for domestic use since weeds have infested a large part of the shallow beds (Kulshrestha et al. 2017:169). According to Kori et al. (2006) the quality of river Betwa slightly improves during monsoon and post-monsoon periods. Betwa has played an important role for the people living in the villages around the river, where it has had religious meaning and been used for drinking purposes and agriculture (Kori et al. 2006:147-148). During our field visits we could observe three temples alongside Betwa with ties to the river. One in Kiratnagar and another being the famous Shiva temple of Bhojpur. In Jhiri, the origin of the river has its own temple with a shrine over the spot where Betwa starts. There is a prayer inscription on the shrine wall, translated from Hindi to “1000 praises to the water God from which we drink water”, see figure 2. When locating the village on Google Maps³, it is possible to see the temple called Betwa Udgam Sthan, translating roughly to “the place where Betwa originates”.

³ Link to location on Google Maps: https://goo.gl/maps/Y2Yyenqg77B2
4 METHODODOLOGY

Chapter 4 more thoroughly treats the structure of the chosen method which is mainly comprised of semi-structured interviews with women connected to the river. The thesis is complemented with secondary sources from peer reviewed articles as well as observations and other types of personal communication. In the following sections, the process of selecting case study site and respondents is accounted for, as well as a motivation of the chosen interview technique. To strengthen the reliability of the study, the chapter also treats how the collected qualitative data has been analysed. The chapter is completed with a section attending ethical considerations during field work.

4.1 SELECTING CASE STUDY SITES AND RESPONDENTS

The Betwa River battles with human caused pollution, household waste being one aspect but industrial effluents the main issue. In this particular context, industrial effluents originate from the industries in the municipality of Mandideep. Hence, villages within the municipality in
proximity to the river are targeted. The level of pollution differs, depending on geographic location. The water before the start of the main industrial area is less polluted compared to the river after the industrial area. However, the waters level of pollution is in direct correlation with the distance downstream of the industries. With this in mind, four villages scattered at different locations around the river were chosen, see figure 3. One before the river passes through Mandideep, called Jhiri, and three after the industrial belt; Satlapur is located closest to the area, followed by Kiratnagar, putting Ashapuri furthest downstream from industrial belt. These villages were chosen in accordance with NIWCYD. In figure 3 Bhutnath Dam is pinpointed, being the closest natural water source of Ashapuri and constituting only of Betwa water.

The interviews have all been collected during the dry season between November and December of 2018. Furthermore, NIWCYD’s local knowledge has been helpful in finding suitable respondents. The requirement for the thesis was to talk to adult women that live in proximity to the Betwa river. Since NIWCYD work in the area with empowering women, some of the respondents were a part of their skilled development programs. However, to strengthen the validity of the study it was important to also interview women not directly mediated by the NGO. Therefore, some women were asked on site. To further avoid affecting the validity and reliability of the study, no other delimitation in regards to the women, such as socioeconomic status, caste and employment, has deliberately been done.

**Figure 3:** Map of selected area and case study sites  
Source: See table 1
4.2 PARTICIPANTS CHARACTERISTICS

A total of 21 women, ranging from 18 to around 60 years of age, participated in interviews for this study. For the elder women, most of them were unsure of the exact age so most of these women gave an estimated age. 16 of these where in rural sites and 5 in a semi-urban site. Three interviews were individual and the remaining were group interviews with two or more participants. Participants included 8 unmarried women, 12 married women, and one widowed woman. Except from three Muslims, all are Hindu, 20 belong to other backwards castes and one to scheduled tribes. Two of the participating women are illiterate and three women have enrolled in higher education.

<table>
<thead>
<tr>
<th>Date</th>
<th>No of participants</th>
<th>Interview length (hrs:min:sec)</th>
<th>Participants age</th>
<th>Village</th>
<th>Caste</th>
</tr>
</thead>
<tbody>
<tr>
<td>20181124</td>
<td>1</td>
<td>00:18:56</td>
<td>32</td>
<td>Kiratnagar</td>
<td>OBC</td>
</tr>
<tr>
<td>20181124</td>
<td>2</td>
<td>00:17:35</td>
<td>18, 19</td>
<td>Kiratnagar</td>
<td>OBC</td>
</tr>
<tr>
<td>20181126</td>
<td>4</td>
<td>00:19:39</td>
<td>18, 21, 25, 38</td>
<td>Satlapur</td>
<td>All OBC</td>
</tr>
<tr>
<td>20181126</td>
<td>1</td>
<td>00:23:13</td>
<td>Around 50</td>
<td>Satlapur</td>
<td>OBC</td>
</tr>
<tr>
<td>20181130</td>
<td>1</td>
<td>00:24:01</td>
<td>18</td>
<td>Jhiri</td>
<td>ST</td>
</tr>
<tr>
<td>20181201</td>
<td>3</td>
<td>00:22:25</td>
<td>19, 21, around 60</td>
<td>Kiratnagar</td>
<td>OBC (Muslim)</td>
</tr>
<tr>
<td>20181201</td>
<td>5</td>
<td>00:19:01</td>
<td>18, 20, 20, 22,</td>
<td>Kiratnagar</td>
<td>OBC</td>
</tr>
<tr>
<td>20181201</td>
<td>1</td>
<td>00:17:48</td>
<td>Around 50</td>
<td>Ashapuri</td>
<td>OBC</td>
</tr>
<tr>
<td>20181201</td>
<td>2</td>
<td>00:17:32</td>
<td>42, 55</td>
<td>Ashapuri</td>
<td>OBC</td>
</tr>
</tbody>
</table>

Table 1: Interview details and participants characteristics

4.3 INTERVIEWS

To map the women’s day-to-day patterns, qualitative semi-structured interviews were used. Semi-structured interviews allow for a more flexible approach during the interview where the respondents replies steer the progression of the interview (Bryman 2018:563) The interview questions are constructed with a holistic view on livelihoods in line with SLA, in an attempt to capture all dimensions forming livelihood strategies. With this in mind, the questions are also influenced by the intersectional framework in order to further understand what discriminatory grounds shape the individual’s capability. For the study there has not been set questions but rather, each interview has followed a looser scheme to allow the interviewed to speak more freely. However, to initiate conversation and make sure the interviews cover the same topics an interview reference was kept at hand (Bryman 2018:563; Mikkelsen 2005:171). The reference guide has been categorised by themes relevant for the study, such as water, personal, sanitation and health with sub-themes, such as livelihoods, water perception, practises and
perception etc., see appendix 1 for details. The questions have been organised according to guidelines presented by Mikkelsen (2005:174), for example sensitive questions should be asked at the end of an interview, in this context the authors assessed questions regarding caste and faeces to be of a more sensitive nature. Another important aspect in this study are the observational opportunities in field (Bryman 2018:594-595). The importance of observation has been documented by Bryman (2018) who argues that it is possible to grasp more than what has been said by observing the surroundings and respondents body language.

Due to respondent’s native tongue being Hindi an interpreter was necessary in order to communicate with the interviewed. Mr. Gawande, from NIWCYD has functioned as a guide and interpreter during all field trips. By using an interpreter, it has been hard to capture the entire essence of the interviews which, in accordance with Mikkelsen (2005:177) may have affected the quality of the collected data. In order to strengthen the quality of collected answers and minimise information lost in translation, all of the interviews have been recorded and later transcribed for additional reviewing. All the respondents gave their permission to record, but the women remain anonymous. After doing the transcription, a dialogue has been held with Mr. Gawande to clear potential uncertainties and to verify that the authors interpreted the results as correctly as possible seeing that the interviews has been translated from Hindi and that the authors come from a different context. This process has been done in order to minimise misinterpretations even though the authors acknowledge that qualitative data always includes an element of interpretation (Mikkelsen 2005:180).

4.4 QUALITATIVE CONTENT ANALYSIS

An inductive approach has been used when analysing the empirical findings, where we first looked at concrete details to later be able to analyse them and draw conclusions (Mikkelsen 2005:168). The recorded interviews have been transcribed and compiled in different categories using a thematic analysis as presented in Bryman (2018) where the themes from the reference guide together with the purpose and research questions have been used to find suitting topics for discussion and analysis. The sampled data has been examined in accordance to this method where the interviews has first been reviewed to grasp the outline of the results and later categorised (Bryman 2018:702-703,707). By doing so, the authors were able to detect recurring patterns from the respondents and possible differences between respondents. The collected content from interviews and observations have been analysed with the help from the theoretical framework of intersectional political ecofeminism and SLA. In chapter 5 and 6, the detected themes have been used to outline the result in an accessible way. When analysing the results, the interview guide (see appendix 1) has helped in the categorisation of data, which can be seen in the sub headlines of chapter 5 and 6.

4.5 METHOD DISCUSSION & ETHICAL CONSIDERATIONS

Mies and Shiva (1993) assert the natural order in the relationship between researcher and research subjects as being vertical. When researching exposed groups, such as women and populations in developing countries, it is of great importance to be aware of vertical power
structures (Mies & Shiva 1993:38). According to Bryman (2018:491,588) qualitative studies are well suited for feminist studies since a qualitative study minimise the risk for oppression and enables the woman to remain a subject instead of being treated as an object. When examining women’s livelihood patterns this is of utmost importance. One of the ways to incorporate intersectionality during field work, is explained by Davis (2014) and regards looking at ones positioning as a researcher in terms of gender, class, ethnic, sexual and other social identities. It is important to look at how one's background shapes one’s influences (Davis 2014:22). In this thesis, the uneven relation between respondent and researcher is partly due to the researcher’s affiliation with an established organisation, as well as ethnographic origin were backgrounds and capabilities between researcher and respondents differ. The relationship is further hindered by the language barrier. This complicates the natural flow of the interview, posing a risk of turning the interview into an interrogation rather than a conversation. The interpreter plays a key role in upholding the conversation. This may be further complicated by him being in a position of power, since he works for a recognised organisation. During several interviews, men interrupted to give their opinion on questions directed towards the women. It was difficult to convey that the purpose of the interviews is to collect data on female perceptions. Occurrences like this can impede on the authenticity and/or the trustworthiness of the study (Bryman 2018:467). To make sure that the validity of the study remains high, no male opinion has been considered or used in the study. In one session this meant that the interview had to be cut short due to difficulties in communicating this.

This study has only looked at the situation for a limited number of women in four villages. The reliability may be enhanced by collecting a larger number of interviews. The extent of the collected data was determined by time constraints for both authors and the NGO. Since NIWCYD helped interpreting the interviews the authors depended on designated resources from the organisation. But we argue that the method of choice, in depth interviews, has allowed for a theoretical saturation since it was possible to distinguish patterns in women’s perceptions and strategies (Bryman 2018:507). The data collected during field work may not give the results a generalisability in itself but the data is strengthened by previous research, accounted for in chapter 3 which the authors believe enhance the reliability of the result.

5. EMPIRICAL FINDINGS

The results from the field work are presented in the following chapter. First the characteristics of participants are concluded. When analysing the empirical findings different themes were distinguished, based on the categorisation of the interview guide (see appendix 1) to simplify the analysis in chapter 6. The following chapter has therefore been divided in four topic representing results collected from respondents replies and observations made in field; water and sanitation routines, livelihood strategies, health practises and finally a section on the women’s perception of community and governmental support.
5.1 CHARACTERISING WATER AND SANITATION Routines

Today, river Betwa is only utilised on a daily basis in Jhiri, from where the river originates. The river is used for all domestic and personal needs including drinking. Jhiri is a small village where everyone lives in close proximity to the Betwa river. The women fetch water from its source since they do not have taps or pipelines. The interviewed women, a young woman and her mother, do not perceive water as a problem in terms of using it for drinking, washing, cooking etc. since they have unlimited supply of clean water running through the village. But the village does not have any system for sanitation which is seen as a problem. Instead, they perform their needs in the open. Since Jhiri is in a forest area, animals are a threat and the lack of electricity further makes it difficult to go when it is dark outside. Even though indoor washrooms and electricity are of biggest concern, they also stressed issues with unpaved roads and lack of transport to schools, hospitals and jobs. The women of Kiratnagar and Satlapur do not believe that they can utilise the river safely. The fact that the river is too polluted to be used is common knowledge among the interviewed. During rainy season the attitude towards the river is slightly different in Kiratnagar and Ashapuri. It is more frequently used, not for drinking, but activities such as cleaning and bathing. In Satlapur on the other hand, rainy season does not change neither their perception or practises, instead they visit the Kaliyasot river occasionally.

JHIRI
AREA: Rural tribal
POPULATION: 500
HOUSEHOLDS: 222 (60 near Betwa)
Betwa river originates from Jhiri. Located 10 km from Bhopal, near Mandideep. Families are part of the Bhilala community and Bheel tribe which counts as scheduled tribe. The village has no other water source than Betwa river, which flows through the village. There is no electricity and no sanitation systems.

Box 1: Characteristics of Jhiri

Kiratnagar, Satlapur and Ashapuri, unlike Jhiri, have access to sanitary infrastructure, tap water from pipelines and sometimes hand pumps or another borewell. The tap water, supplied by the Panchayat⁴, is only provided during a limited time and is supplied on alternate days. Depending on which Panchayat that provides water the cost varies between 70 to 300 rs per month (see box 2, 3 and 4 for individual prices of each village). In all villages, storing of water

⁴Panchayat literally translates to “council of five”. A panchayat is like a local rural government for the five nearby villages (Hardgrave Jr. & Kochanek 2008:131-134) which, among other things, control the water supply.
was the common practice. In Kiratnagar and Satlapur the storage containers were kept outside and we never saw concealed ones.

In Ashapuri, the Betwa flows into the Bhutnath dam as its only tributary. The women in the village did not reflect on the cleanliness of the dam. The water from the pipelines and hand pump was perceived as enough. They did not express a need to walk all the way to the dam on a regular basis, except for maybe two or three times a year for swimming. The water related issues they stressed regarded the size of the inhouse toilets. Many women prefer to defecate outside due to the small size of the washrooms. No risks were perceived in this habit, only the inconvenience with finding privacy. One of the individual interviews in Ashapuri were held on the outskirts of the village, near the Bhutnath dam. She does not have access to the pipelines that are provided to the rest of Ashapuri and therefore has to walk far every day to collect water. She is depending on the water from the dam and use the water for both bathing and washing. This woman also lacked access to any type of sanitation system, due to this she practices open defecation which she perceives as very risky. The main threat being animals, primarily snakes.

In Ashapuri, Jhiri and Kiratnagar we learned that the river is primarily used by farmers. According to one woman in Kiratnagar, the water was utilised more frequently 10 to 15 years ago. At the time people used it for bathing but also drinking. During another interview in Kiratnagar, the same scenario was described. They further added that it was much harder back then when they had to walk one kilometre to fetch water, carrying it on their heads. Today, people still go to the river, but only occasionally. Mainly for swimming, bathing or for picnics. Some go nearby to practice open defecation. However, when driving past the river near Kiratnagar we observed people both bathing and washing clothes in the river. The tap water provided by the Panchayat used for household purposes is perceived as enough in Kiratnagar. Later, during some interviews however, it emerged that in case of emergency they turn to the river water. In Satlapur one woman confirmed that the river was used in earlier times. She said that ten years ago the whole family went to Betwa and used the water for bathing, drinking and washing clothes. Today, not even animals drink from the river since the water has a horrid

<table>
<thead>
<tr>
<th>KIRATNAGAR</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AREA:</strong> Rural</td>
</tr>
<tr>
<td><strong>POPULATION:</strong> 927</td>
</tr>
<tr>
<td><strong>HOUSEHOLDS:</strong> 222</td>
</tr>
</tbody>
</table>

Kiratnagar is a mixed village with both Hindu and Muslim homes. Main castes all belong to OBC with only one family assigned SC. No drainage system. The village gets water from a borewell distributed by Bhojpur Panchayat. Water is provided during one hour on alternate days which costs 100 rs/month.

**Box 2: Characteristics of Kiratnagar**

**Figure 5:** A broken hand pump in Kiratnagar  
**Source:** Christine Persson (2018)
smell. Instead of visiting Betwa, they occasionally use the Kaliyasot river for bathing and washing clothes.

5.2 CHARACTERISING LIVELIHOOD STRATEGIES

During the field study, different types of livelihoods were accounted for. All the women interviewed are responsible for household chores regardless of having additional occupations or not. For those working, this was seen as a problem since the chores take up a lot of time. In Jhiri, women also help with farm work and some collect jungle wood cuttings from the forest, which is later sold. In Kiratnagar, Satlapur and Ashapuri some of the interviewed are housewives and many worked with various jobs, such as teaching, farming and domestic work for other families. In Satlapur, one respondent expressed that it was the women’s responsibility to provide the family with water. If households ran out of water supplied from taps, they had to walk one kilometre to a nearby well and collect more water. This was further confirmed by observations of women carrying water from the direction of said bore well. The woman living in the outskirts of Ashapuri was the one who collected water for the family and had to walk approximately 500 meters to the hand pump.

5.3 HEALTH PRACTISES

In Satlapur, one woman explained that the water from the pipelines is too hard, causing abdominal pain and kidney stones. The rest of the 20 women do not fall ill often. Women from both Kiratnagar and Satlapur said that bathing in Betwa river causes skin diseases. The access to hospitals differs between the villages. Satlapur has a private clinic that is well equipped but the interviewed women do not visit it regularly because it is expensive. The government hospitals are free but the women in Satlapur do not think that the care there is sufficient. The women in Jhiri and Kiratnagar share this opinion on government hospitals. Both Kiratnagar
and Ashapuri have weekly visits from mobile clinics that help with smaller health issues and check-ups for pregnant women and children. In Kiratnagar a majority of the women said that they usually do not visit the doctor but rather go directly to the pharmacy since it is too expensive to do both. Women from the same village said that they use Ayurveda⁵ and boil their own medicine for smaller things such as menstrual pain.

<table>
<thead>
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<tr>
<td>AREA: Rural</td>
</tr>
<tr>
<td>POPULATION: approx. 1 778</td>
</tr>
<tr>
<td>HOUSEHOLDS: 300</td>
</tr>
<tr>
<td>A mixed village with mainly Hindu homes and 6-7 Muslim families. Ashapuri has forward castes, OBC and SC. Located near Bhutnath dam with the only inflow being Betwa. The village gets water from a borewell distributed by Ashapuri Panchayat which is provided during 45 minutes on alternate days for 70rs/month. There is also a hand pump.</td>
</tr>
</tbody>
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5.4 COMMUNITY AND GOVERNMENTAL SUPPORT

Washrooms and taps have been installed by the government in all villages, except for in Jhiri and in the house outside of Ashapuri. Even so, all the interviewed women feel that governmental policies do not reach them. The women in Jhiri did not feel that information regarding their rights and policy changes trickles down to them. In Satlapur on the other hand, when it comes to solving issues regarding water, education and work opportunities, all interviewed women put their hope in the corporation that is very present in the village, P&G.

Overall the women experience that the community is strong and safe. They expressed happiness in regards to living in their villages. During one interview in Ashapuri it was disclosed that they indeed are happy to live in the village, but the contentment is partially due to lack of other options. In Kiratnagar, two of the women feel threatened when visiting the river or going for open defecation alone. The threat comes from both within the community and from passing outsiders. Kiratnagar is perceived as a divided community by some of the interviewed, where castes live alongside each other but keep to themselves. Muslim women in the village express that they do not experience any caste discrimination and that the four Muslim castes stick together. The real threat, in their opinion, come from outsiders visiting nearby historical sites. When it comes to the other villages the perception of caste hierarchies seems very different. In Jhiri there is only one tribe so discriminatory caste practises are not present. There

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⁵ Traditional medicine developed and practiced in India for thousands of years (WHO 2010).
is a strong sense of community in the village where it is important to marry within the tribe. In Satlapur the women also feel a strong sense of community, both within and between different castes.

6. ANALYSIS

Chapter 6 analyses the results from conducted interviews and observations made during field work, through the theoretical framework. It starts with discussing the women’s interaction with the river, and geographical differences. Then it moves on to analysing the respondent’s livelihood strategies and capabilities before looking at their thoughts on governmental support as well as problematising societal hierarchies.

The women that we have spoken to, all interact with the river in various ways. Some go bathing there, occasionally, and one implied she only used it in case of emergency. Apart from the women in Jhiri, it was only the woman living in the outskirts of Ashapuri who said that she uses the river water on a daily basis. Betwa river is first and foremost used out of necessity in Kiratnagar and Ashapuri village, when the clean water from pipelines is not sufficient. During rainy season however, at least one more household see the water as clean and therefore use it more regularly for bathing and washing. Nearly all of them indicated that others use the river but were hesitant to admit their own utilisation of Betwa. Deeper into the interviews however, practices involving the river appeared. There is a reluctance to admit using Betwa water since it is common knowledge that the water quality is inadequate. This is supported by an observation made down by the river, near Kiratnagar, were inscriptions on the stone wall of the river basin is warning visitors of the river. The phenomenon that individuals turn to unsafe water sources when lacking sufficient safe water supply (Baker et al. 2017:1-2, Truelove 2011:143), became evident when conducting the interviews. When the supplied water failed to fulfil their needs, the river was utilised occasionally. In addition to this, the time limitation on running water forced all respondents to store water in open barrels which, as argued by Brick et al. (2004:473-474), increases waters level of contamination.

Neither open defecation, bathing, washing or other human activities sparked any reflections on potential human pollution of the river. From the interviews it became evident that open defecation still is a widespread practise both near the river and at other locations. This is a form of human pollution that has a negative impact on both the river and the environment in general (Kulshrestha et al. 2017; Landrigan 2018; Mandloi 2014). However, the women interviewed did not reflect on this practise in terms of pollutants or environmental impact. The biggest concern in regards to open defecation was safety and/or comfort. One thing that was not mentioned but observed was the amount of solid waste scattered around the riverside. We were told the river serves as a picnic spot which can be part of the explanation but another might be lacking waste disposal systems. This is further confirmed from what both Kulshrestha et al. (2017) and Mandloi (2014) claim, that waste disposal plans have failed to keep the same pace
as India’s overall development. Industrial pollution dominates the women’s explanation to why the river is unfit for use.

Even though the respondents admittedly utilised water from the river daily in both Jhiri and the outskirts of Ashapuri, the difference in quality of water between the two locations shapes the women’s livelihood strategies differently. For example, the women in Jhiri can fetch water easily. But the woman in Ashapuri has to fetch drinking water from the village hand pump, a half kilometre away, and then goes to the Bhunath dam to get water for domestic use. Fetching water took most part of her day, leaving little time for paid work. This shows how the polluted water has a direct impact on her livelihood strategies and capabilities. Another dimension of her livelihood strategy is her form of employment, she is a daily wage labourer, mostly in farming, without a guarantee of daily work. The women in Jhiri primarily work on the family farm and occasionally collect jungle wood. Another part of their income strategy is selling grains from the farm on markets nearby Bhopal. For the other villages, the women that worked contributed to the family income but all women, regardless of village, still relies on income from men in the family. The form of employment available for the women and the possibility of owning land, can be seen as a class dimension and is an important part of the intersectional outlook presented by Molina (2016) and Crenshaw (1991) amongst others. Lack of economic independence hinders their possibility of social mobility and contributes to a weak position. Another example of the social dynamics was seen during several interviews where men wanted to answer questions directed to women about their personal perceptions or experiences. This

Figure 8: Storing containers for water in Jhiri Source: Christine Persson (2018)
further shows which social position the woman possesses. In the case of India however, the social position is already manifested by the caste system which limits social mobility (Bapuji & Chrispal 2018:3). In the studied villages, only castes from OBC, SC and ST live. Even though the interviewed women said that no caste discrimination occurs, the fact that only lower castes reside in these villages indicates some form of segregation. When analysing discrimination, it is important to pay attention to all the different structures that form oppression by applying an intersectional perspective (Molina 2016:34). Even though the respondents said no discriminatory practises occur the Muslim women in Kiratnagar still highlighted a form of segregation between religions in the village, where Muslim families stick to themselves. Even though the respondents live side by side with Hindus the community is divided depending on religion. It became apparent that Muslim respondents identify with various social belongings, caste and religion being two of them which according to Crenshaw (1991:1242-12444) can create marginalisation for the individual. Constraints in their mobility could be seen through some of the women’s attitudes when being asked if they are happy where they live. They said that they are happy, but added that it does not matter because they have no other option. It was never clarified exactly why there are no other options but the response indicated lack of economic power or structural constraints related to culture. One crucial difference could be observed in regards to the women in Jhiri, who do not have to rely solely on income since the grains harvested from farming supplies enough to sustain the whole family. This reflects the difference in capabilities in regards to land ownership as well as access to adequate natural assets, where the women in Jhiri has a greater possibility to obtain sustainable livelihood strategies.

The presumption that water fetching is a female task (Gaard 2015:23, Sorenson et al. 2011:1523) was confirmed by all respondents, due to women being responsible for all household duties. The respondents that lack taps and pipelines, in Jhiri and the outskirts of Ashapuri, rely on fetching water daily. In the event that residents of Satlapur run out of water, it is the women that collect water from the well located one kilometre away from the village. When looking at this distribution of workload, described by the respondents, it becomes evident that household duties, including supplying the family with water, is first and foremost assigned to women. Not only is water fetching time consuming and physically demanding, like other forms of domestic work it does not yield income. The responsibility of supplying water, puts women in direct contact with the issues of polluted water. This strengthens the political ecofeminist argument that workload is unevenly distributed between sexes and that women are in closer contact with environmental hazards (Gaard 2015:23-24).

The usage of the river has changed over time in step with the rivers degradation, resulting in a behavioural change in the villages. The investments in pipelines and tap water has decreased people's exposure to the river and its hazards. People are not as dependent of the river as they were ten years ago. But, the supply of water they have today is scarce and we received many indicators that the small amount of water from the taps is not enough. With this in mind, one can say that their possibility to combine different livelihood strategies are limited. Today, they seem less dependent on the river as a water source, and therefore in a sense, not as exposed to its hazards, but more dependent on infrastructural implementations that holds many other forms of challenges and problems. Connections between the location of the villages and level of perceived hazards can be drawn. Villages located closer to the industrial area of
Mandideep experience hazards to a greater extent. Women in Jhiri and Ashapuri, located furthest away from and on opposite sides of Mandideep do not express the same concerns in regards to the water quality as women in Kiratnagar and Satlapur. Jhiri is located above the industrial area of Mandideep and therefore not polluted by industrial effluents. Because of this, we could observe the relationship between women and water without the industrial impact, and compare their livelihood strategies to those of women in other villages, such as Kiratnagar, Ashapuri and Satlapur. Since Jhiri has not gained access to infrastructure improvements scheme, respondents in the village do not experience the same struggles as women in the other villages. The lack of infrastructure is however perceived as a problem. The women residing there are completely dependent on Betwa as their only, but easily accessible and unlimited water source. The other villages are highly affected by the industrial pollution and at the same time they are experiencing infrastructural problems such as insufficient water supply. If the industrial pollution were to reach Jhiri, this would most likely have consequences for the people living in the village, affecting their livelihood capabilities and strategies. However, if the prerequisites were different in the other villages; with a clean river like in Jhiri; or if the infrastructure was good enough, their strategies could look different. This indicates that industrial pollution has great impact on female livelihood strategies.

Figure 9: Toilet and washroom in Kiratnagar Source: Christine Persson (2018)
7. DISCUSSION

In chapter 7, the research questions are answered more thoroughly with the help of the theoretical framework; intersectional political ecofeminism and SLA. Here the topics of the Bhopal gas tragedy and governmental responsibility are given further attention and discussed in relation to Agenda 2030 and India’s development vision.

To answer the research question of how different livelihood strategies, create different exposure to river related hazards for women, we can first conclude that it is not as we assumed when formulating the research questions. Different livelihood strategies, in this setting, does not create exposure to the river but rather the opposite, different levels of exposure to the river creates different livelihood strategies. Water scarcity and other prevailing circumstances, like insufficient infrastructure, force women to adapt their livelihood strategies accordingly. If the river was clean enough for use, the strategies would probably look different. It is at the same time relevant to acknowledge the fact that their needs determine the attitude towards the river. Of the interviewed women, many said that Betwa is unfit for use and condemned it as a source of water. Still, they visit the river. The firm belief that the river is unfit can be compromised when the need succeeds the worries of potential hazards. The perception of hazards also quivers in relation to seasons. During rainy season, respondents are more prone to utilise the river because the health threat is perceived as less prominent. However, Satlapur and Jhiri both differ from the other villages in this aspect, representing polar stands. In Satlapur the river is too contaminated, even during rainy season while in Jhiri, the river is perceived as clean all year round. This leads us to the second question of potential geographical differences in perception.

As mentioned in the analysis, the villages distance from the industrial area stands in direct correlation to the level of perceived water related hazards. Further, the prerequisites of every village determine how women experience the river and therefore, potential risks. Health threats were more prominent in Kiratnagar and Satlapur which both are in close proximity to the industries. All the while the respondents in Jhiri expressed more of an infrastructural concern in regards to sanitation.

The Government of India has taken initiatives to protect their citizens in terms of safe water sources and adequate sanitation systems (Ministry of Drinking Water and Sanitation n.d). We could indeed see that improvements to the infrastructure has been made in the villages. The National Rural Water Programme aim to provide all rural citizens with a sustainable supply of safe water at all times and in all situations. But from what we have seen in these villages, the water supply from the Panchayats is not sufficient, forcing residents to turn to what Meade & Emch (2010:262) refer to as unsafe sources; such as wells from remote locations or unsafe practices; such as storing water in open containers. In Jhiri, the women we spoke to did not perceive any water related issues. As has already been discussed, unsafe water sources include surface water, such as rivers and streams (Meade & Emch 2010:262). Even though the women seemed satisfied with the quality and quantity of water, it is not a safe source since their only source of water comes directly from Betwa river. Since rural citizens still turn to unsafe sources
it cannot be said that NRDWP has succeeded. When looking at sanitation, a lot of what we have just argued can be repeated. Initiatives, such as the Swachh Bharat Mission, have reached most of the villages, but one could question if the changes made are enough. The women still go for open defecation, which is exactly what the Swachh Bharat aims to eliminate. Somewhere the government, which has claimed it their responsibility to achieve safe water and sanitation for all (Ministry of Drinking Water and Sanitation n.d), have failed to understand who the stakeholders are and to accommodate their needs. Women in Ashapuri and Kiratnagar, for example, still turn to unsafe sanitation practices even though infrastructural improvements has been made. The solutions are not customised for them despite the fact argued by Kulkarni et al. (2017:169-170) that women face high risks when practising open defecation. By not fulfilling the stakeholders needs, the vulnerable position of women remains unaltered, cementing inequalities between the sexes. This further makes it evident that inequalities between sexes in fact are socially constructed and maintained, as argued by Gaard (2015) and Goebel (2003). In Jhiri, again, the government has failed to implement any initiatives at all. The women there pursue all their needs in the open, which they admit themselves is a dangerous practice.

As mentioned in the introduction, environmental degradation caused by industries is not unknown to the area. The Bhopal gas leak killed tens of thousands and destroyed even more people’s lives (Amnesty International 2004:1; Eckerman 2005:213; Odysseos 2015:1043).

Figure 10: Household collecting water in Kiratnagar Source: Christine Persson (2018)
More than 30 years after the incident, new generations are still suffering tremendously (Amnesty International 2004; Eckerman 2005). A lot can be said about the gas leak, although, this does not belong in this thesis. But one relevant aspect is that, even though the disaster was exceptional being among the worst of its kind, the company fails to take responsibility for its massive pollution. This may be only one incident, but it still indicates the overall attitude from corporations and the government in regards to environmental degradation. The phenomenon with transnational corporations, like UCC, locating their polluting and destructive activities in countries like India, a country dependent on economic development, partly shows this attitude and what could be referred to as global environmental racism. As treated in the section of Intersectionality, environmental management reflects societal hierarchies (Gaard 2001; 2011). This can be seen by the pollution and degradation of natural resources, which manifests and deepens social inequalities (Gaard 2015). Intentions to take responsibility for destructive activities and efforts to implement adequate initiatives are lacking, not only in India, but globally. This makes it relevant to talk about the priorities regarding development. India positions itself as the key in the global ability to fulfil Agenda 2030 (United Nations India n.d.). But the country mainly focuses on goals regarding poverty reduction and infrastructural development, giving less attention to goals considering environmental health (UN HLPF 2017:v-vi). Critique can be directed towards these priorities, strengthened by the incident in Bhopal in 1984 and the events following the leak. The sustainable livelihood approach argues that long term prosperity depends on the three pillars of wellbeing; social, environmental and economical (Morse & McNamara 2013:6). Furthermore, Scoones (1998:5) argues that a livelihood is sustainable when it is resilient against shocks and can maintain or enhance assets while not undermining the natural resource base. Without safeguarding natural resources, human resilience against fatalities as well as their capability to attain a sustainable livelihood decrease. This in turn hinders sustainable development for the country. In the chapter on SLA, we argued that sustainability often is associated with restraints instead of prosperity and that there is a general tendency to neglect social and environmental dimensions as long as the economic one is strong (Morse & McNamara 2013:3-4). India is no exception, and the willingness to incorporate environmental and social aspects in their development agenda is there on paper (UN HLPF 2017:v) but not reflected in reality. Concrete examples can be seen both in the poor water quality of the Betwa river (Kamyotra et al. 2016:24) and through the mismanagement of the Bhopal tragedy (Amnesty International 2004; Eckerman 2005:213). In the long run, this enhances poverty rather than reducing it.

8. CONCLUSION

Polluted water is a serious global problem. Water pollution leads to water scarcity if damages are not managed properly. In the case of Betwa, the river is mainly contaminated as a result of industrial effluents. This thesis has examined women’s livelihood strategies in relation to water pollution and the female perception of the Betwa river. To comprehend the female perception, qualitative interviews has been conducted in four villages in proximity to the Betwa river. In these areas it became evident that the river plays a role in the respondent’s lives and livelihood
strategies. Every woman interviewed in the study relates to the river, one way or another. Not being able to use the water is in itself a way of relating to the river. However, the quality of the river water is not their main concern. Women’s livelihoods are not dependent on the Betwa, even though the river indirectly affects it. The level of interaction with the river depends on the geographic position of the village and proximity to Mandideep’s industrial belt. It is possible to draw the conclusion that if the river was clean, access to water for the women and their families would increase and water related issues and efforts diminish. The women’s possibilities are directly connected to environmental wellbeing and the continued undermining of natural resources reduces their capability to obtain sustainable livelihoods. For many of the people living near the river, infrastructural solutions have been implemented by national initiatives. However, these implementations do not reach everyone and comes with restrictions which greatly influences people’s wellbeing and capabilities.

The study embarks on the bigger discussion of responsibility and accountability of environmental degradation and the social effects that follows. Due to industries dumping their effluents in the Betwa river, the gap between the powerful elites and socially weak widens. There are tendencies of segregation based on caste in the villages around Betwa, where the main population belong to lower castes; OBC, SC and ST. When analysing the level of pollution that has been allowed in the Betwa river, one can easily see similarities with both environmental racism and environmental classism. One way in which these forms of environmental discriminations are expressed, is in the phenomenon of toxic and/or polluting industries being established in areas where vulnerable groups reside. In the setting of this study, one can question whether the presence of polluting industries as well as the resident’s caste belonging can be seen as a type of environmental casteism?
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**TABLE 1**

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*Table 1: Interview details and participants characteristics*

**TABLE 2**

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APPENDIX 1

Interview guide

INDIVIDUAL

Community
How long have you lived here? Is there a strong sense of community? Are you part of this community? Is caste important here? What caste do you belong to?

Livelihoods
What does your day look like? Do you work? With what? If you work - where is the job? Do you get paid? Do you have any other income source? Selling items on markets for example. Do you depend on your husband's income? Do you have any education? Who is responsible for household duties?

Personal

WATER

The river
Is there clean water in the river? Or is it polluted? If so: why do you think the water is polluted? Do you visit the river or use it in any other way? Do you use water from the Betwa river? Do you feel safe when visiting the river? If no, why?

Water Perception
What is clean water for you? Where do you get water from? Is it far? Where do you shower/bathe? What do you do with the water? Drink, cook, bathe, clean etc.? Do you store water? If so, how?

Politics
Has there been any political action taken in regards to water supply? New wells etc. or more toilets etc.? Is the water supply dependent on/or affected by the seasons? Who ensure that the family has water?
SANITATION
Practises and Perception
What kind of a toilet do you use? Is it your own, or public?
Does it work well?
Do you use the toilet for all purposes? urination and defecation? (or open defecation?)
Where do you defecate openly?
Can you go when you want to or are specific times better?
Do you feel safe? Do you go alone or in a group with women?
When you have your period, how does it work with sanitation pads? What is the preferred way to handle it? In toilets or openly?

HEALTH
Patterns
Do you often get sick? How? Stomach- or headache? Physical pain?
Where do you go if you are sick? Is (eg. hospital) it a good place?
When was the last time you visited a doctor/hospital?