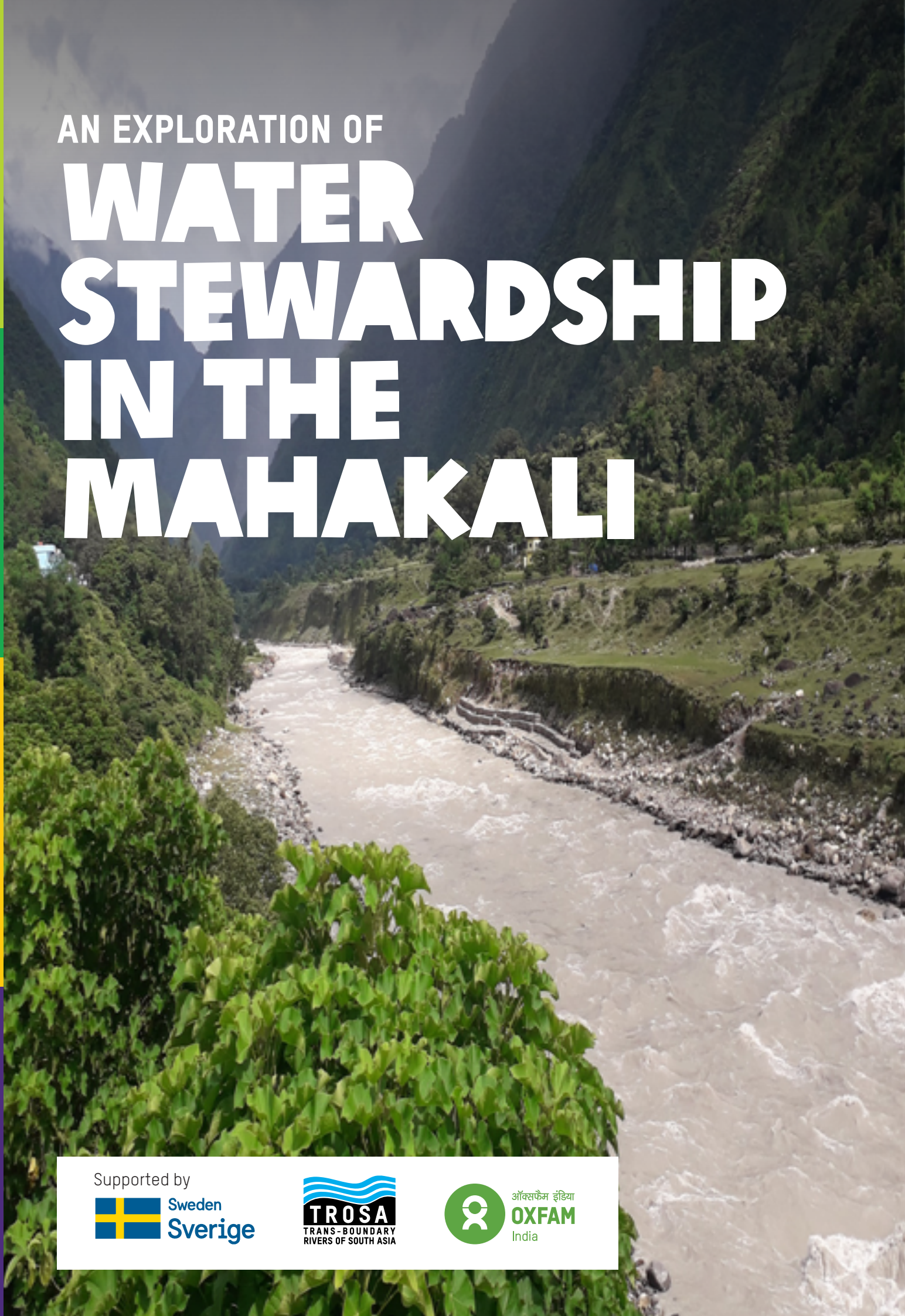

AN EXPLORATION OF

WATER STEWARDSHIP IN THE MAHAKALI

Supported by

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TROSA
TRANS-BOUNDARY RIVERS OF SOUTH ASIA

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TROSA is a five-year regional program (2017 - 2021) jointly implemented by Oxfam and its partners to address the challenges of water governance in river basins of South Asia. It aims to ensure that riverine communities uphold their rights, build their resilience, and participate in water resource management.

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1.1 Introduction and Background

Water is the most essential fuel on which runs the engine of human civilization. Humanity's growing footprint on this limited earthly resource has been mainly due to increase in population growth, industrialization and changing consumption patterns((United Nations World Water Development Report: 2019, Chakraborti et.al:2019, Hamilton et.al: 2019). This excessive pressure now has taken the form of an 'invisible water crisis' (Damania et.al 2019) triggering a myriad of other problems associated with the community's health and livelihood. This growing crisis is also due to a lack of accountability, responsibility, integrity and stewardship at various levels of governance (Tortajada: 2010, Hamilton et.al :2019).

For achieving the goals of 'good water governance', it is very essential that the participation of the community (Neef: 2009, Tortajada:2010, Cleaver and Hamada: 2010) be considered central in the management of shared water resources. After the failure of the technological transfer approach (Black: 1998) in water governance framework, new approaches have now started gaining momentum with the central idea of involvement of local people in the stewardship of their resources (Chambers: 1983, 1997). This mainstreaming of community participation in management of common property resources is now adopted as a normative approach in major water policies. That is why, community perceptions and participation in decision making is now recognized as the most important component of a just water governance regime, as pointed out by Grassini (2017).

The global discourses on climate justice, environmental dynamics and governance which emerged in the twentieth century has also evolved as an important foundation on which the modern water stewardship framework are being reimagined with the inclusion of the community at the center of planning and implementation. In this regard, the UNECE (United Nations Economic Commission for Europe) has underlined the importance of effective governance framework and emphasized on the importance of sustainability of existing ecosystems and community resilience for fighting against the adverse effect of climate change (UNECE, 2019b). The issues of ecological disequilibrium, water contamination, industrial pollution, judicious exploitation of river water, drinking water problem, and Water Foot Print are issues of crucial importance in the current era as they can culminate in some kind of existential crisis and threats endangering the lives and livelihood of populations living in critical geographies. In transboundary basins these issues may act as a catalyst triggering the risk of conflict between riparian communities and cultures. Highlighting the inadequate institutional and community cooperation in trans-boundary river basins UNECE (2018a) underlined the possibility of increased number of scuffle and provoking situations that may act as the fundamental basis of friction between nations on shared water resources.

Water has both favorable as well as unfavorable consequences and manyatime leaves a multi-faceted imprint caused by its interaction with other geomorphological and anthropogenic causes. One the one hand, it can unite communities on the basis of common problems but on the other, it can become a bone of contention between two or more nations and cultures thereby creating more gaps in finding avenues to water equity and justice especially for marginalized riparian communities. According to UNECE (2016), transboundary river and lake basins comprise nearly 60% of global freshwater flow including 600 shared aquifers. Shared waters therefore are the medium of cultural, social, economic and political dialogues between different nations and stakeholders including the private sector and the community who are accountable and responsible for governing them in a comprehensive and inclusive manner.

Ensuring an effective Water Governance regime in transboundary river basins demands co-operation at all levels and if critical issues are not handled properly and diplomatically, it can easily escalate into frictions and tensions both at the regional and local level. All the issues related to water governance between two countries, be it sharing of water, contamination, and distribution needs to be resolved through peaceful dialogue and by inculcating cultural governance within the broader framework concerning hydro-diplomacy. Community rights water cooperation, participation and justice should therefore form the core of any transboundary policy making. That is why it is rightly conveyed in the UN (2018b) document which says "Transboundary water cooperation is vital to prevent conflicts and ensure effective and sustainable management of shared resources."

Transboundary rivers play a crucial role in directing diplomacy and politics, impacts environmental management and ascertains the livelihood of the people in its vicinity. It provides a range of ecosystem services, livelihood strategies and opportunities, nurtures the cultures of communities and in turn water itself gets embedded in the social, political and economic processes of the region. A river in this sense is a local, regional and national resource placed in multiple contexts of utility. Therefore, viewing water stewardship through a very centralized diplomatic tool representing the singular interests of some specific stakeholders shall have to face severe challenges in attaining the goals of sustainability. A centralized view is more prone to overlook the networked ecosystem services by taking a myopic understanding of nature-extended to water, as merely resource to be harnessed. Keeping a narrow approach may only amplify the impact generated by the various hydrological factors thereby triggering other socio-economic and ecological vulnerabilities in the community (Grigg: 2011: 799). An alternate to this exclusive consumerist view of water and its governance may be attributed to a very traditional approach of resource extraction without responsibility adopted by policy makers without considering the dynamics involved in the sphere of hydrology and the cultures sharing shared water spaces. A more refined community centric approach provides the possibility to consider alternative spaces of parallel imageries and facilitates the possibility of dialogue:

[1]Read the statement by the UNECE on the concerns it had raised on the growing friction on transboundary water resources "Trans-boundary waters in many areas of the world are however not used sustainably and cooperation in many trans-boundary basins is not adequate to tackle the existing and emerging challenges. The situation is projected to aggravate in the coming decades owing to increasing pressures from population growth, agriculture, energy production and the impacts of climate change" (UNECE, 2018a)

often an indispensable structure for transboundary communities. Such a decentralized and multi-dimensional approach incorporates instrumental avenues to address the multi-faceted spatial dynamics of water governance.

In this context, understanding Water Stewardship can help us explore direct and indirect Water Footprint and further assess how the consumption and exploitation of water in various production processes can affect sustainability of life and livelihood across the river basin. Generally, a very comprehensive corporate water stewardship assessment through the lived experiences of people can help us get a holistic insight to the production assessment culminating in the facilitation of the dialogue between the state, private actors and the community. The concept of Water Footprint Assessment is a new idea developed and conceptualized by Hoekstra and Hung (2002) with the aim to promote the idea of judicious water use by various stakeholders including the private actors. This unique idea which is evolving through multidimensional discourse created by academicians and development practitioners, holds the same importance like ecological and carbon footprint in the discourses on sustainability. In this analysis, water stewardship is being seen in relation to community's rights to a safe environment and the practice of environmental ethics by state and private actors during the production of goods in transboundary basins. Fresh water is a limited resource and the understanding of its consumption in various ways is very crucial for strengthening water governance regimes in transboundary basins. These sources of water in critical geographies are exposed to various vulnerabilities caused by anthropogenic factors especially industrial production processes which have been identified as one of the leading polluters of water, air and land globally. That is why it becomes very essential that narratives and discourses on water governance also include in it the understanding of corporate Water Stewardship in transboundary river basins.

[2]Virtual water trade A quantification of virtual water flows between nations in relation to international crop trade, Value of Water Research Report, Series No: 11, IHE DELFT, Available at https://www.waterfootprint.org/media/downloads/Report11.pdf

1.2. Rationale for the Study

This study is an attempt to address challenges related to water consumption and pollution in a transboundary basin with multiple stakeholders embedding itself in the context of the social space of the rivers. Exploration of water stewardship forms a part of the transboundary dialogue between the stakeholders of India and Nepal aimed at understanding the nature of consumption of water in a transboundary region by taking the private actors into consideration and the community into participation. Discourse on water stewardship and footprint endeavors to help the various stakeholders in taking ownership in developing a collaborative framework on critical water quality issues in the Mahakali Basin.

In this context, understanding Water Stewardship can help us explore the impacts of direct and indirect water footprint on the lived geographies and further assess how the consumption and exploitation of water in various production processes can affect sustainability of life and livelihood across the basin. Thus a very grounded approach of analyzing the everyday life of the riparian communities can help us get a comprehensive insight of the production assessment which can pave the avenues for developing a framework for the facilitation of dialogue between the various stakeholders in order to ensure responsible stakeholdership and holistic transboundary water governance.

1.3. Objective of the Study

1. Understanding water stewardship in the Mahakali River in relation to lived geography and experiences.
2. Exploring perceptions and narratives from the people on the Water Footprint of private actors in selected areas of the Mahakali Basin.
3. Understanding the interconnectedness between water and livelihood in upstream and downstream riparian areas of the Mahakali.

1.4. About the Study Area

The study area is in the States of Uttar Pradesh and Uttarakhand, and Province 7 of Nepal in the Mahakali River Basin (also known as Sharda Basin in India). The focus districts included:

1. Lakhimpur Kheri District of Uttar Pradesh and Uddham Singh Nagar District of Uttarakhand in India.
2. Kanchanpur, Dadeldhura, Baitadi and Darchula districts of Nepal.

Figure 1: A Zonal map of the Sharda River Basin:

A Map prepared with the help of the TROSA Community Mobilizers

The Mahakali River originates at the conjugation point of India, North-Western Nepal and China in The Great Himalayan region which is still a point of controversy among these three countries. From its origin, the river starts flowing downward bordering India and Nepal. In India, the river flows through the 'Pithoragarh', 'Champwat', and 'Udham Singh Nagar' district of Uttarakhand state and Pilibhit Lakhimpur and Sitapur district of Uttar Pradesh. In Nepal, the entire 'Mahakali zone' is divided into four administrative districts i.e. 'Baitadi', 'Dadeldhura', 'Darchula', and 'Kanchanpur'. Several tributaries join into the river at different points of confluence. Due to its tremendous flow upstream, the river is personified as the Hindu Goddess 'Kali'. However, when it enters the Terai plain, it becomes calm and hence is called 'Sharda', again symbolizing another Hindu Goddess. The upstream region of the river is mountainous and most of it is covered with dense forest. Human settlement is dispersed in this region. The river carries substantial sediment from the mountainous region in the form of natural pollutants but due to sparse population and lack of any heavy industries in the upstream region any anthropogenic pollution remains relatively low as compared to the densely populated downstream areas. When the river enters the plain, loss of gradient results in rapid sediment deposition making a shallow riverbed, subsequently facilitating the occurrence of frequent floods in greater parts of the region. The

major problems in the upstream of the river are dumping of solid waste in Mahakali river (as most of the dumping sites in Nepal and India are located on the bank of river). In addition to it, sewage from the households, waste from commercial hotels and enterprises connect to the tributaries of the river, improper management of crimination spots account as major sources of pollution in the river. In the downstream region of Uttar Pradesh, industrial and agricultural pollution are the major problems frequently disorienting the ecological balance of this area augmenting the effects of the most prominent hazards like floods and erosion.

1.5. Conceptual Framework

This study follows a regional approach in evaluating the water geographies of the Mahakali river basin. It identifies the corporates and the community as the stakeholders in creating the Water Footprint geographies, albeit with embedded power disequilibrium in their relationship. To that end, designing issue-targeted interviews with each group brings out a comprehensive structural framework associated with each group of stakeholders. Based on the interviews and the focused group discussions, key issues are identified and analyzed. The study-region characterizes an unequal social space because of its caste hierarchy and also tries to explore the power inequalities intricately embedded in the social structure. Even though the study does not address the ubiquitous networks of inequality and discrimination in details, the outcomes might be in subtle recognition of its importance as an influential factor.

A better terminology representing the social space of the communities of the Mahakali river basin would be riverine ecologies which are environmentally sensitive communities, with agriculture as the primary source of livelihood. The role of women in such riverine ecologies is more significant than their male counterparts because the prevalent narratives identify woman as environmentally more conscious and concerned, since the last few decades' narratives and discourses on water governance have brought into light the significant contribution of women in agriculture and has also established the discourses on the feminization of poverty along with the environmental and economic vulnerability of women as a stakeholder group.

Although women's social roles and positions in community based water governance regimes are visible but their vulnerability emerging out of the same structural foundations often remain invisible and are manyatime ignored in policy level discourses. Structured gender relations affect all aspects of life, including rights and access to and control over resources, levels of decision-making power, labour, cultural aspects and even national identities. The impact of gender relations manifests in any institution of the society, and water being an indispensable resource, considering the role of gender (here, only women) becomes crucial for existential growth and sustainability of governance regimes. It acknowledges the significant role of women in managing household water consumption and that is why women have been involved as an indispensable cohort within the community for the study.

The framework is based on engaged field visits, ethnography with a dialogical approach and focus group discussions. The following table lays out the thematic dialogues that have emerged from the field studies and the report has adopted these themes as central to the study.

1.6. Methodology

The current framework of qualitative exploration is based on engaged field visits, ethnography with a dialogical approach and focused group discussions. The community narratives were taken from the various classified zone in the basin. The selection of the study sites, communities and corporate, has been mostly qualitative in nature. Based on the objectives of the project, the following methods were adopted to collect perspectives and opinions of communities in the study region.

Target Interviews and Targeted Focused Group Discussions:
This method entailed data collection with two different sets of pre-determined specific questions directed at both the groups. Special members (influential decision-makers) from each of the groups were identified for interviews on the similar issues. The results of these interviews were utilized as core discussion points in the Focused Group Discussion. This ensured that the 'significant' issues are adequately addressed for both the corporate and the community.

A Brief Household Open-ended Questionnaire for the Community:
Arising out of the Focused Group Discussion, there were ample issues on which individual data/household unit-data could be collected and hence an attempt was made for the same. Sometimes individuals from the target community are not comfortable enough to speak out on certain issues they might deem as controversial. In the caste-based society of Uttar Pradesh, power relations, subtle caste differences and discriminations might render the data output from group discussions incomplete. Often people open up to face-to-face interviews while discussing social issues which they otherwise omit in the presence of members from their community. Therefore, an open-ended questionnaire based household survey was conducted to make sure that the data collected is inclusive to the best possible maximum.

Special section of interviews focusing specifically on the role played by women in utilization of water and consumption of water for various other activities:
Acknowledging the significant role of women in water access and utilization, a special section of interviews focused on the interlinkages and networks that center-stage woman in the household consumption; so that a gendered water footprint perspective could be documented.

Mental Map:
A mental map is one of the best tools to retain and display spatial depictions of the socio-geographical space they are a part of. Making a map helps contextualize how people locate themselves in the trans-border region of Uttar Pradesh and Nepal. The samples from the

Source: Taken during the field work, June 2019

community on which this activity is administered was small, but crucial stakeholders of the community who are well aware about their surroundings were included in the discussions.

Narratives through time:

Multiple narratives emerged from the members of the community about the dependence, interlinkages, influences and impact of industries and the changing water geographies in their community over a period of time. Therefore, the timeline has been documented and woven into the narratives presented in the report.

Conceptualizing Water and Water Footprint - Narrative from the Community:

The study begins with the notion that it would be of special interest to include a narrative about the very concept of water stewardship from the community itself. The fundamental question therefore was how the community and women perceive and conceptualize the increasing need to save, conserve and justly use water for their own uses - this needs to be a narrative emerging from the geographies of the river basin. Community perspective has therefore remained central to the thematic design of the study.

Transboundary Community Dialogue

Since transboundary issues are crucial to this study, collecting data separately from the two communities and then drawing an analysis of the two was considered an important criterion in the study. Therefore, a focus group of communities, representing both Nepal and India was conducted with the idea to explore the common livelihood issues, understanding about water-sharing and the conflicts of water governance as manifested in their daily spaces.

2.1 Major Concerns from the Community

Various field visits were conducted to identify the important issues of concern in the community. A glimpse of the major concerns to understand stewardship and footprints of the community and the private actors is being depicted through the following summary table.

Table 1.1: Table depicting the various issues in the Mahakali

Flood	People from the Nepal side of Mahakali river basin receive less amount of water during dry season while in rainy season they often have to face floods. Early warning system in the region is not very efficient and the rehabilitation process from the administration is also not very adequate. The same concern was raised by the people residing on the Indian side of the basin as well. Often water is released without any warning signals to the communities resulting in their crop damage in the most difficult geography of the upstream and the already polluted agricultural lands of the lower Sharda Basin.
Sharing of Water	Equal access to water resources is yet a challenge for the transboundary communities and conflicting political scenarios have led to compromise of livelihood in the area. Access to water for irrigation purposes has been identified as one of the major concerns for the riparian communities in the Mahakali River Basin.
Weak Local governance institutional set up	Even though both the countries have constitutionally equipped their local administrative bodies for water governance in their respective region, they have practically very little experience, information, knowledge, mandate and will to take action. They always have to look to the higher authorities for solving their problem and because of bureaucratic inefficiencies, communities at the border have to face severe challenges in securing basic water rights.
Data unavailability	Local administrative bodies and water user association members struggle in maintaining comprehensive and continuous real time data on critical hydrological parameters at the unit level of administration. They do not have information related to the number, type and amount of water resources available in their region, contamination level in water, real time implementation of various programmes and schemes of government, water footprint of individual, family, community and

	corporates of their region, livelihood and employment status of women, crop pattern, water budgeting, etc.
Water Quality	Villages situated near the sugar supply industries have to struggle with safe and clean drinking water. The sugar industries in the lower part of the basin have been irresponsibly dumping waste in the rivulets turning some into unhealthy drainage channels. Quality of water during the peak production season is being compromised by the big businesses in the region. While spring water contamination is a major issue in the upper stream with the high presence of Escherichia coli, lower basin suffers from chemical contamination triggered by mismanaged industrial waste. Community members also reported about the unaddressed water quality issues in groundwater sources in some prime locations in the basin. The varying water table and the high presence of iron and arsenic in some areas have been reported very strongly by some community members.
Accountability	Water footprint in its technical form is an alien concept for rural community people but traditional knowledge on conserving water could be observed in certain instances. There is a difference between community members' and corporates' understanding of the problem. Most of the time they make the state and the community accountable for reducing water footprint. Role of administration is also not adequately satisfactory in this matter.
Livelihood and Sustainability	People from both sides of the river face dual challenges of water scarcity in dry season and floods in rainy season. Because of this, the communities on both sides of the border have to face serious threats to life and livelihood.
Lack of Awareness and Technical Knowledge of Water Resource Management	The awareness and technical knowledge to pursue ecosystem based adaptation (EbA), Integrated River Basin Management (IRBM), Integrated Water Resource Management (IRWM), Rain Water Harvesting system, sustainable development, etc. is lacking even among the civil society and local leaders. They struggle on exploring pathways for coping with the various water issues that influence community life.
Corporate Cooperation	The corporates of that region have mostly confined their attention to production and profit making. While the focus on the heavy loss of revenue every year due to crop damage during floods is a concern identified easily, the everyday struggle of the community due to water contamination is yet to be addressed. There is no platform where all

	three stakeholders i.e. Community, Corporate and Administration could come together and plan water stewardship to deal with these issues.
Lack of knowledge of Government Schemes	There is no coherence between planning and functioning of various government departments both at the national and regional level. The community lacks access to basic information on flood early warning, water availability, major government schemes and livelihood provisions provided to them by their respective governments.
Unemployment	Members of fishing community have been facing severe loss of livelihood due to diversion of water from Sharda canal since decades. The lease system in fishing is also reducing their opportunity as private actors with influential mechanism and resources often invade the local spaces and occupy those places which were traditionally used by local riparian communities for fishing. It is also banned in some areas for environmental and other technical concerns due to which some villages have withdrawn the occupation completely and have explored alternative livelihoods. In some parts, illegal fishing through dynamite bombing and poisoning was also reported to be a major problem.
Soil Erosion	Soil erosion during flood is a very serious issue. The river bed is full with siltation. Government is not putting any effort to solve this problem. This is a serious security threat for the communities and animals in this region.

Source: Focused Group Discussions and Interviews with various stakeholders.

A. Understanding Water Stewardship through perceptions and lived experience

The study follows a regional approach in evaluating the water geographies of the Mahakali river basin. It identifies the corporate and the community as stakeholders in creating the Water Footprint geographies, albeit with embedded power disequilibrium in their relationship. Designing issue-targeted interviews with each group brings out a comprehensive structural framework associated with each group of stakeholders. The study-region characterizes an unequal social space because of its caste hierarchy and hence power inequalities are intricately embedded in the social structure. Although addressing such omnipresent networks of inequality and discrimination is beyond the scope of this project, the outcomes might be in subtle recognition of its importance as an influential factor.

A better terminology representing the social space of the communities of the Mahakali river basin would be - riverine ecologies. Riverine ecologies are environmentally sensitive

communities, with agriculture as the primary source of livelihood. Understanding of gender spaces in such riverine ecologies is very pertinent because of the burden of responsibility that women are entrusted by the patriarchal power structure with less or no chance of participation in decision making. Social science research has always been highlighting the need for the recognition of feminization of agriculture in poverty alleviation and the need for the assessment of environmental and economic vulnerability of women as a stakeholder group. Gender allows women's social roles and positions to become more visible. Structured gender relations affect all aspects of life, including rights and access to and control over resources, levels of decision-making power, labour, cultural aspects and identities. The impact of gender relations manifests in any institution of the society, and water being an indispensable resource, considering the role of gender (here, only women) becomes crucial. This study acknowledges the significant role of women in managing household water consumption and hence women have been involved as an indispensable cohort within the community for the study.

B. Geography of water in upstream Mahakali: Riverine communities of Nepal

The Mahakali is revered as a sacred goddess in both India and Nepal - an ecological religious approach embedded in the common Hindu culture in both the countries. The river is associated with the Purnagiri temple in Uttarakhand and hence, believed to be blessed by Purnagiri Mata. The life of an individual in the Nepali community is marked with intricate encounters with the river throughout their lifetime; starting from the celebration of birth, marriage ceremonies and rituals including death and post-death rites which begins and ends at the Mahakali.

Water in such a context acquires identities assigned by the social space in which it is located. It becomes more than a natural resource exploited for its economic utility - it becomes a social enabler, a cultural icon, a religious representation of the nature of the community. The river is not just an economic resource for these agrarian economies; it imbibes within itself the values, spirituality and belief system of the communities. However, not all rivers are assigned this reverence. As a farmer so justified, "all the Him rivers are holy, we revere them because they are the lifelines of our society." By 'Him rivers', she meant the rivers originating in the Himalayas - a manifestation of the oral traditions of knowledge, common to both India and Nepal.

In this sense, water and its identities simultaneously also constitutes the identity of the society and its communities. For agrarian communities, the overlap between water as livelihood and water as sacred arises from its economic necessity to sustain life because the sustenance of such society depends almost entirely on access and availability of fresh water. Such riverine ecologies can almost entirely be defined from its dependence on its over-arching resource - water.

The society of Nepal, similar to that of India, is stratified along caste identities, which is still a determining factor of the livelihood pursuits or 'permissible' occupations of the people. The people carry out agriculture as their primary occupation, cultivating rice, wheat and vegetables.

Rice and wheat are grown with a commercial interest whereas the growing of vegetables is primarily to cater to domestic consumption and fodder for the animals. With the continued efforts and leadership guidance by the civil society organization working in the field of water governance, various transboundary networks and dialogues have been initiated to serve as an auxiliary to occupational pursuits.

The tunnel cultivation of vegetables serves as a good example for the community highlighting women leadership in water management. There has been an increasing focus on arriving at a gender-just water governance in these peripheral geographies whilst recognizing the fact that there are improvements yet to be made in the overall governing apparatus. Cleaver and Hamada (2010) argues that governance needs to include a balanced understanding about the ways in which a societal structure influences the allocation of resources through economic policies, legislation and to 'consider how different people are able to influence the outcomes of particular governance arrangements to produce gendered outcomes'. They further argue that development interventions taken to address water governance 'need to widen their gaze away from a narrow focus on establishing mechanisms of access, disconnected from the wider social context'; and access needs to be improved according to the context established by the social structure. In this context, therefore, the tunnel cultivation of vegetables led by the women of the Nepali society serves as a successful example of gender-just water governance.

As a dichotomy to this laudable water governance model functioning in the society of Nepal, is the harsh other side of the coin: gender inequality embedded and reinforced within the society when it comes to determining access to water. Women are almost entirely responsible for the household chores, ensuring water availability in the household and caring for the needs of the domesticated animals of the household. Whereas this model of responsibility on women for providing water echoes in the communities of India too, religious regional customs adds another layer of exclusion to the women. During menstruation, the women are precluded from accessing water from the household hand-pump because of their 'impure' touch. This cultural ritual is translated into spatial practice within the Nepali community, extending the imagination of pollution of water to a psychological reasoning justified through the regional religious customs.

For the Nepali society, water is sourced from both surface and ground. In the villages, groundwater has taken precedence for domestic consumption, household chores and for taking care of the cattle. The groundwater is accessed through hand-pumps to all the households and is used for drinking. It is considered a safe source of water and the water is subjected to no further process of filtration and is consumed directly from the hand-pumps. The water extracted via pumps was subjected to testing for its purity about a decade ago post a flood season in 2012, and no more tests have been conducted ever since. Groundwater is also the source of irrigation for the agricultural activities carried out by the villagers.

We call it regional because this form of separation of women during her period of menstruation is not unanimously practiced by all the Hindus. In India, it is practiced by the Assamese Hindu community of India's North East and by the Nepali community in both India and Nepal. In this sense, there is a regional attribute present in determining such a practice and is not limited by religion.

Figure 2: The picture shows the riverine community on the banks of the Mahakali or the Sharda

Source: Google Earth, as accessed on June 30th, 2019

There has also been a shift in the source of water for the community in Nepal - from the surface water of the Mahakali to groundwater. As per the recollected memories of the elderly villagers, the water of the river and its small tributaries was used for direct consumption, household chores and for agricultural activities in the past. There was a steady decline in the availability and quality of the water which discouraged the villagers to continue with the use of the water directly. The primary cause was singled out to be pollution created through the dumping of waste and cremation activities on the bank of the river.

> *"How do you drink the water of the river when you have just cremated your loved ones on the bank of the same river?"*
>
> *"I saw the waste dumped on the water we drink. Once you see the waste wallowing in the river, you just can't bring yourself to drink that water."*
>
> *"The river was our one solution to everything - drinking, cleaning, cooking, bathing... But then it got polluted and so we cannot use that water any longer."*
>
> *- Community narratives about the change in sources of water*

The floods of 2012 brought further changes in the quality of water. The villagers initially dug wells in the process of looking for alternative sources of water. The presence of frogs and other reptiles discouraged them from further exploring water in wells and ever since then, hand-pumps have been the source of groundwater. The perception of the community about the situation of water contamination and the real scenario overlaps critically and there is an associated gap in knowledge when it comes to awareness about the pollution of water.

The dumping of garbage constitutes the primary waste in the Mahakali. There are no industries in the vicinity of the upper basin of the river and hence, unlike India, there is no industrial pollution. However, agrarian pollution does constitute a brewing problem for the society in the days to come. Currently, most of the manures and fertilizers used are organic. Small amounts of urea and chemical pesticides are used in agricultural activities in order to ascertain a profitable yield. Whereas most of them are absorbed in the soil, but in the monsoon, surface run-off of such chemical fertilizers joins the river from the fields. This constitutes a possible risk, because an unchecked intensification of the use of chemical fertilizers could grow into the major source of water pollution for the upper basin Mahakali in Nepal.

Water contamination in the Mahakali is a matter of serious concern for government of Nepal as well. At the local level of governance, water has faced different challenges where the active role of the villagers and the Village Pradhan has already been successful in achieving the desirable results. Fish-poisoning and fishing through dynamite had surfaced as concerns within the community in the past. Through various village level consultations and organized intervention at the community level, such fishing activities carried out by the people were checked and brought under control. However, the local authorities have faced severe challenges in ensuring co-operation from the private actors who have been committing environmental crimes and endangering the fish population in the region.

Figure 3: Village Bhujela: A riverine community on the banks of the Mahakali

"Fishing in the river has always been in our memories. But these new short-cuts to fishing: through mass poison and dynamite are ills and must be discarded."

"Poison fishing and dynamite fishing kills everything in its way. We tried to stop them, we got the village Pradhan involved. But isolated incidents like that sometimes happens anyway."

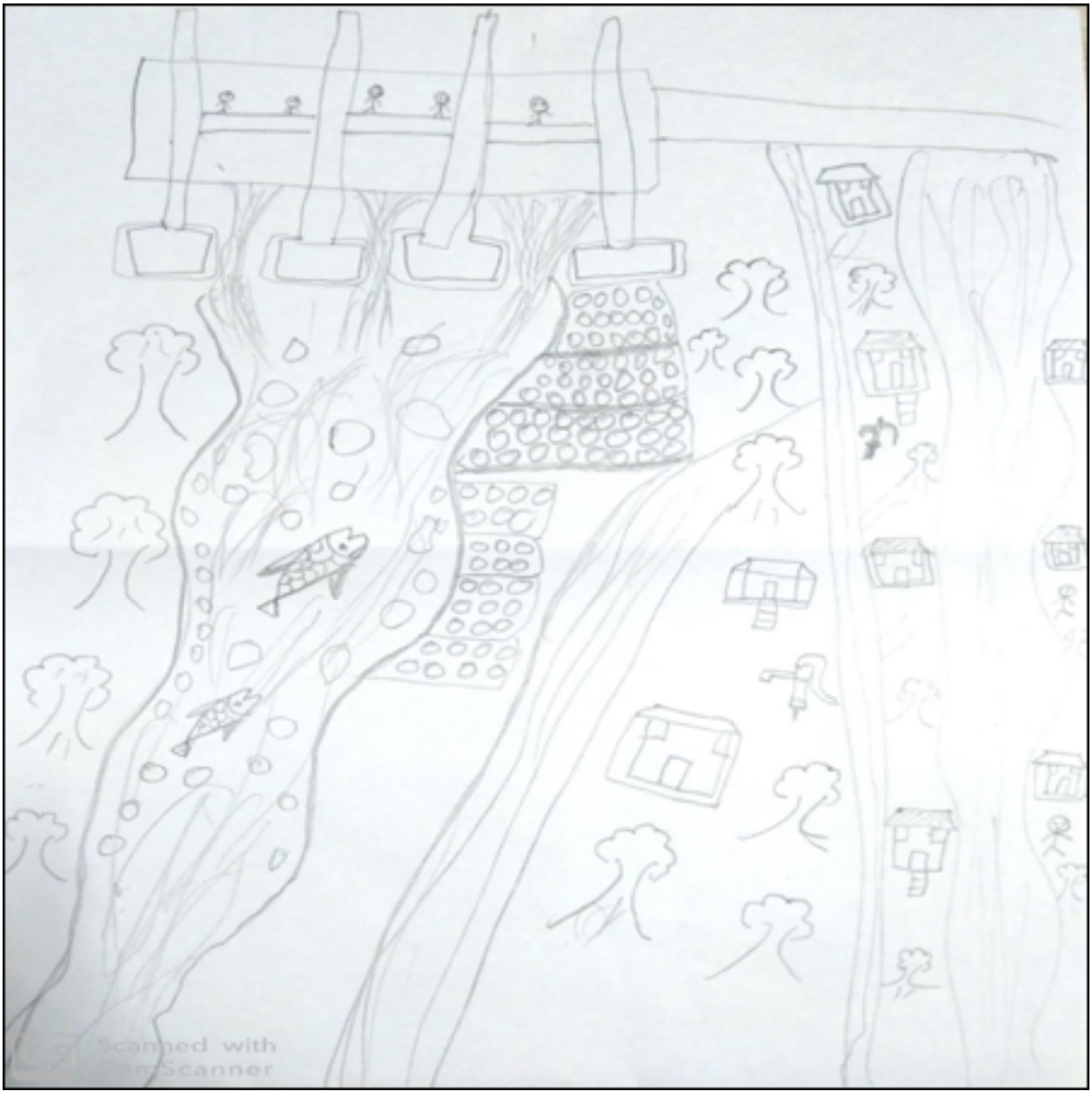
- Community narratives about poison fishing and dynamite fishing

The community is embedded in its associated identity with the Mahakali in two intricately connected ways: the first is through the transboundary identity assigned by the river barrage and the other is through agriculture as its occupation. Sharing of water has generated multiple spatiality of engagement between the two counties of Nepal and India. The Nepali society stated that water availability is a genuine problem which has hardly been considered at the table during dialogue between two transboundary governments.

Figure 4 : The mental map details the barrage and its controlled waterflow, the pebbled levee of the Mahakali, the village with their household units, agricultural fields and hand-pumps. The dividing channel through the village is a small rivulet named after the village itself - Bhujela river. The surface run-off from the agrarain fields drains into the Bhujela which contomittantly drains into the Mahakali. The icons of the social space identified by the community through this map is indicative of the dependence of such riverine communities on water. June 2019.

[4]Note that the settlements are dispersed with the homestead lands merging with the cultivated areas. Unlike the villages of the Ganga plain of India where settlements follow a cluster-pattern with cultivable lands forming the periphery of the villages, the villages in the plains of Nepal follow a grid pattern (refer picture 2) with the agricultural land attached to the household.

Figure 5: The map depicts the same place as depicted in the previous map, although this mental map also captures the issues related to poison fishing and dynamite fishing. The depiction of the village through its agrarian fields and homestead on the bank of the Mahakali reaffirms the depiction in the previous maps. The intricacy of the embedded spatiality associated with water of the Mahakali can be easily identified in the mental maps prepared by the community.



The Nepali communities living at the border areas reported that they face severe challenges in accessing the river water for various consumption purposes. Although a treaty is in place establishing the proportionate distribution of water between the two countries, in the dry period (lasting from October to January) when water is scarce, water needs of the Nepalese communities are not adequately met. In the monsoon (July - September), when water is in excess, excess water released from the canal often creates overflow in the river. As a result, the village has lost almost 10 of its members due to such unwarned, sudden release of water in the past few years. The death of these people has been the source of a substantial bad-blood between transboundary relations.

"The problems of water in our community is that there is no water to begin with." (emphasis original)

"We do not get enough water for our consumption. When water is scarce, all the water is diverted leaving our areas dry. But in the rainy period, when water is in excess, it is released in our territories causing floods in the adjacent villages."

"We don't have problems of water contamination; we have problems of water availability. Although there is a treaty on water sharing still in place, we get no water during dry season."

- Community reporting about transboundary water sharing

C. Geography of Lived Spaces in the Lower Basin: A different story in the same basin

The lower Mahakali basin is predominantly agrarian with small towns acting as service centres for the rural population. Historically this region was considered to be 'unhealthy' for human habitation owing to its marshy natural habitat. Following the colonial administration, lands were classified into forests, wastelands and cultivable lands with the official recognition that there were ample 'wastelands' to be converted into economic lands generating revenue for the State. The partition of Colonial India into India and Pakistan at its independence caused one of the largest cross-border migrations in the history of South Asia. Farmers migrating from Pakistan (mostly Punjab) into India generated immediate demands for vacant lands, wherein the newly constituted Government of India directed the migration flow into the Terai lands of the now Lakhimpur district of Uttar Pradesh. This migration added another component of diversity to the already diverse 'salad bowl' of the society of Lakhimpur. The cultural marker is evident in the name used for common parlance for this region - 'Mini-Punjab'. Given such an ecological context of abundance of water, the farmers had traditionally adopted the cultivation of sugarcane and it continues to be the dominant crop cultivated in the region. Post the green revolution, agrarian practices have become more mechanical and intensified so that extensive acres are mono-cropped with sugarcane. A number of sugar mills have come up in this region, using the harvest to produce sugar.

In the last decade, this industry-agriculture system has accentuated a lot of negative externalities of production leading to extensive contamination of the surface water hampering community's basic right to safe and clean water. It is to be noted that the region is already a water abundant region, also prone to floods during the monsoon period and during any disaster, the impact accentuates with other dynamic implications. Any contaminating episode of surface water (rivers, rivulets, lakes or wetlands), therefore, means engendering a polluting effect to the scale of a disaster in the future.

The community narratives about surface water pollution documents that the sugar mills 'dump' unprocessed waste into the river and rivulets of the region, destroying the river's ecological balance, robbing the rural region of its surface water source and during floods the polluted sewage of the factories creates a highly unhealthy environment for the people of the region. This process is an inter-connected phenomenon. The basin hosts a number of sugar factories which acts as the basis for the livelihood and the economy of the region. Whereas these industries have brought about economic growth, there are negative externalities associated with the production process itself. Waste generated from the sugar factories are a highly debatable issue with diverging narratives from the community and corporate, with the latter completely negating the existence of the problem of waste disposal.

D. Geography of Contamination: The Tale of Sugar Mills

"The water runs black once these factories dump their waste in the river. How can we use that water for our needs?"

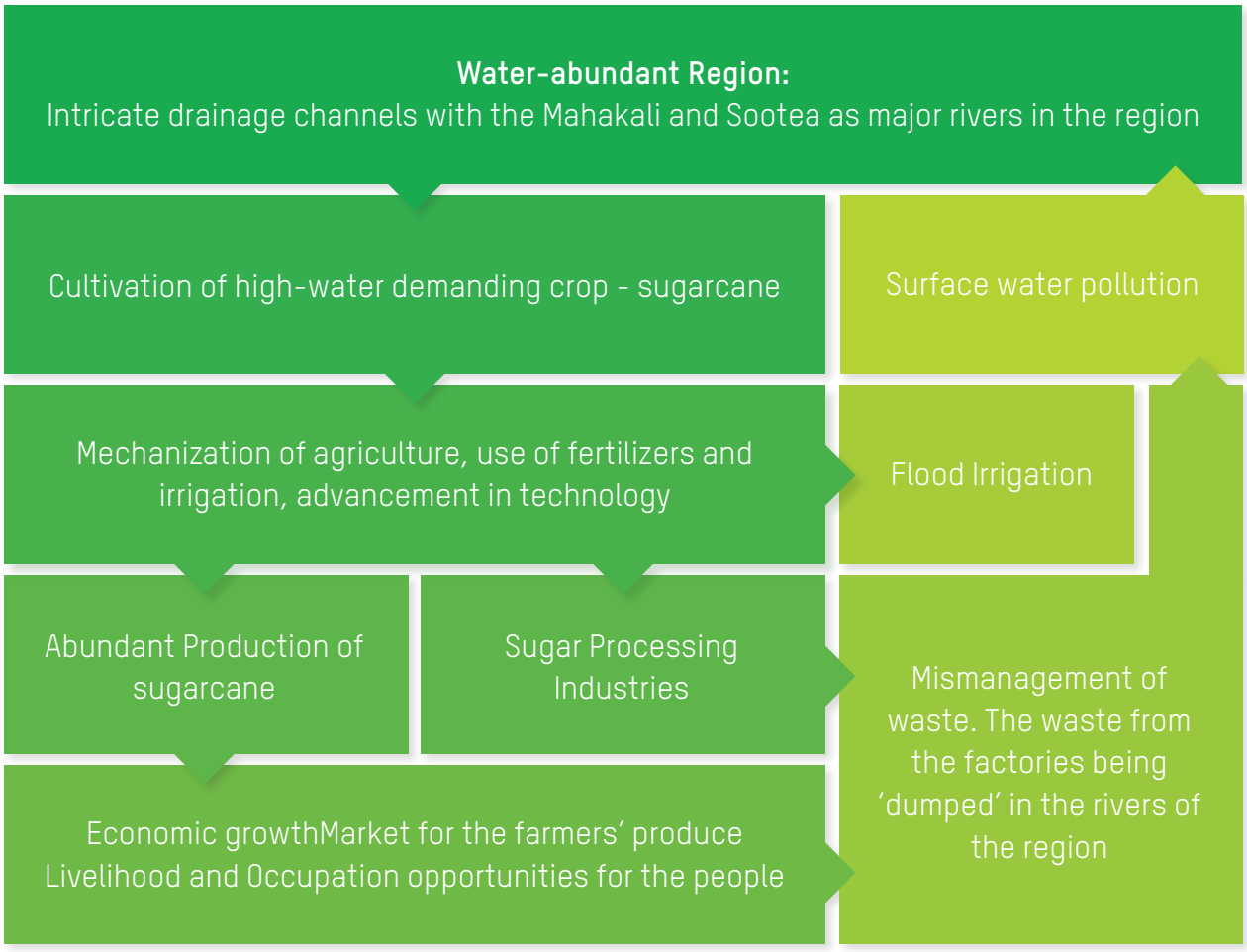
"The polluted water kills the fish, our buffalos cannot go there anymore, our children can't play in the river anymore. And the smell! It's like filth all over the place!"

"In the dry period, they don't release the waste. Once the rains begin they release it then, so that we won't notice. But we are not blind. How can you not notice that the water is running black?"

- Community narratives about water contamination in the region

The diversity in the Indian society is better depicted through the imagery of a 'Salad Bowl' where each of separate participants/components continues to maintain their distinctive but not absolute identities instead of being amalgamated into a unitary whole, described through the imagery of the 'Melting pot'. For example, the society of the US is depicted through the imagery of a melting pot and Indian society through the imagery of the 'Salad Bowl'.

Figure 6 Chart depicting a time line analysis of the process of surface water pollution in the Palia Kalan region of Uttar Pradesh, June 2019.



For Palia Kalan, water is perceived in terms of the utility it provides to the community. It is indeed a commodity for the industrialists manufacturing sugar, a resource for subsistence and a livelihood necessity for the agriculturalists and most significantly, water is increasingly becoming an entity triggering discontents. The contamination of water figures as the prime issue of concern in the water geographies of the region, albeit substantial auxiliary water related issues exist in various forms. In this the contamination from the discharge of industrial waste figures the most prominent one which has not yet received adequate policy attention. The community narratives hold the industrialists accountable for negligence and corruption; which might be very well be a case of non-participatory industrialization in the form of mismanagement of waste disposal and non-adherence to state protocols.

Table 2: Some of the high priority issues related to Water Contamination inferred from the issues identified by the Community

1.	Contamination of the Sootea and Mahakali because of waste disposal by the sugar mills has heavily impacted water quality in villages near the industries.
2.	Contamination of surface water may be a triggering factor to groundwater contamination especially areas near the contaminated points.
3.	Water contamination has a negative impact on the general wellbeing, health and livelihood of the people. Communities who were earlier dependent on fishing have abandoned it because of the shrinking fish population in the water sources.
4.	Dumping of waste from the industries and unrestricted extraction of riverine resources by private actors have largely remained unchecked.
5.	Waste-carrying drains from the sugar mills to the river tends to pollute the nearby areas much more than the entire region. The region has specific sites of intense pollution where the impact is observed by the community to be much worse during flood season.
6.	The sugar manufacturing industries seems to over utilize the ground-water in the region which has only added to the impact created by depleting water quality at the vulnerable hotspots in the basin.

Source: Tabulated from Interview, Focus Group Discussion and Questionnaire-administered Survey in the communities of Palia Kalan, Lakhimpur

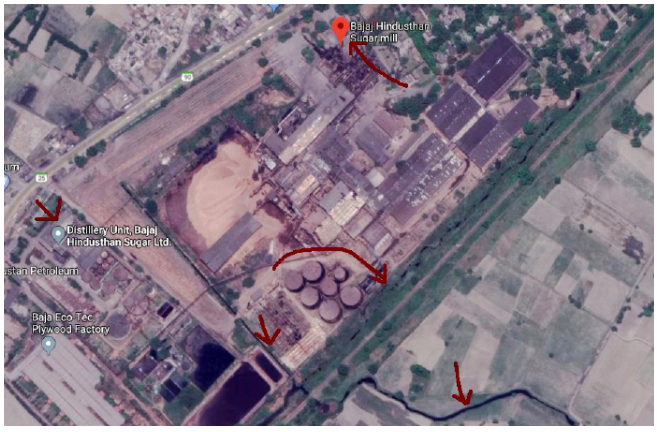
Apart from the visible contamination of the surface water, there are other allied yet serious issues which generally lies hidden and unaddressed. Figure 7 is an abstract visualization of the interrelationship between economic dependency and contamination of land and groundwater sources in the community. The picture shows how the waste produced by the sugar manufacturing industries in Palia Kalan on one hand is a manure used in sugar fields and on the other has cascading impacts on the quality of water in a complex web of interlinkages.

Refer to the Policy Brief on Understanding Corporate Water Stewardship: Narratives from the Sharda Basin by Upadhyay and others (2020)

Figure 7: Sugar Cane Waste: A Slow Poison for Groundwater

Source: Photo taken during field work, June 2019

Infact, the last form of the waste generated in processing of sugar from sugarcane is in the form of a black mull which releases a repugnant smell. This granular waste however is claimed to be very fertile and considered a very appropriate inorganic fertilizer by the private actors. Some of the farmers in the community reported that although it helps in better yielding of sugar cane, it has contaminated the land in various ways. Some of the respondents also informed that people generally dig out about 10 inches of the soil in each crop season before cultivation for better productivity. This waste generated out of the production process could be one of the major contributors of groundwater contamination and proper studies on its contribution on agricultural degeneration could be a scientific consideration. Since farmers have been using harmful chemicals to save the crops from pests, the joint impact generated by the combination of the fertilizer and the pesticide on the general ecological and human health during flood season especially women and children requires policy level attention.



Source: Google Earth, as accessed on June 30th, 2019

The above pictures depict the waste generated from the sugar mills. Note the black drainage from the sugar mills and its meeting point in the source of fresh water near the settlements. The drainage of the waste meets the Sootea rivulet in Palia Kalan.

E. Challenges and Issues of Water apart from the Industrial Waste in Palia Kalan, Lakhimpur

Although waste disposal by the sugar industries figure as the over-arching concern among the communities of Palia Kalan with regard to water quality, there are other intricately connected challenges relating to access to safe drinking water surrounding its availability, management and just utilization which defines the water geographies of the region. Groundwater constitutes the primary source for domestic consumption, household chores and irrigation in the region. Access to safe drinking water is an important issue of concern in Palia Kalan because the presence of heavy metal content in certain locations is reported to be very high. Although government data is insufficient to back as evidence, the community narratives could be a connecting link to examine the interlinkage between the depth of the boring and the detection of heavy metals like arsenic and iron in certain locations. During the course of the field visits, the community responses in unison to the 'very high' iron presence in the groundwater in certain locations within and outside the Palia Kalan region was a normal observation.

> *"If you take a glass of water filled from our hand-pump and let it rest for a while, the water turns red. That's how much iron we have in our water. We have to drink that because we have no other option."*
>
> *- Farmer of Palia Kalan*

There is a direct impact on the health of the community due to presence of arsenic, iron and bacteria in the groundwater. There is no other viable source of drinkable water for the community and in such a dire reality the continued consumption of the polluted water has led to serious health issues in the area. With regard to safe drinking water, the communities have placed their demands under the leadership of the certain basin level institutions and civil society organizations. These demands depict the struggle that these communities have been facing for a long period of time.

i. Construction of water tanks in a number of places in their villages for water storage
ii. Provision of the 'India Marka 2' hand-pump in the respective households
iii. Gram Vikas Yojana to be accountable for proper distribution and maintenance of hand-pumps in the villages

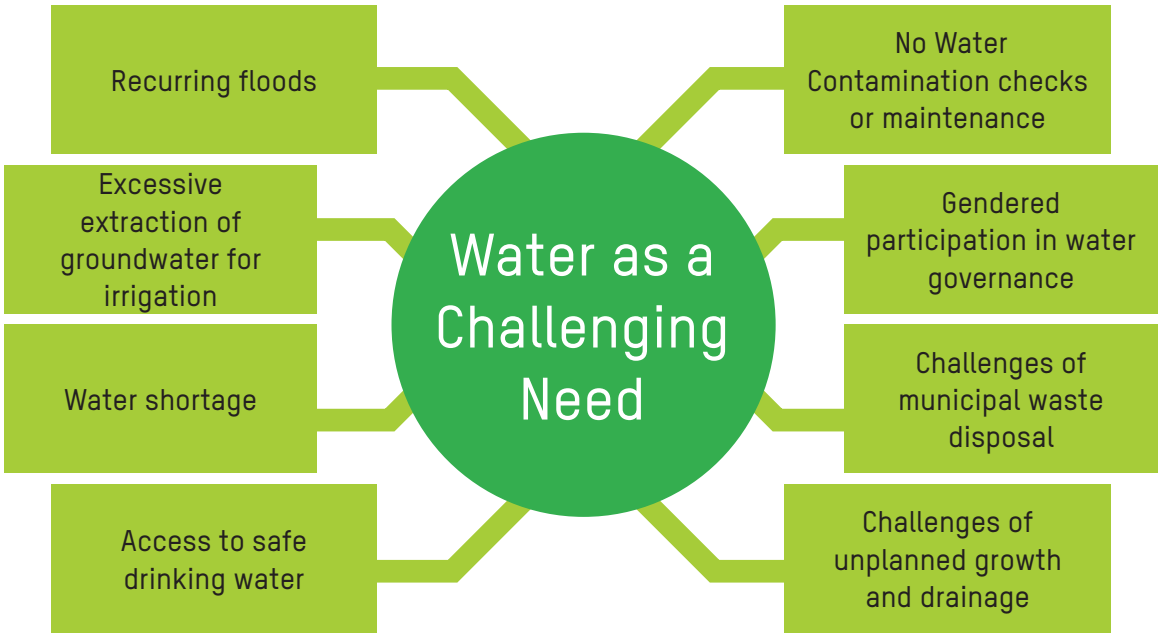
During the study it was found that the community struggles in collective ownership and that is why some elderly women have expressed the need for behavioral change especially among the male members of the villages. In the words of a village mobiliser, "Some male members of the communities themselves are not conscious of their contribution to the contamination of water because they do not take it as a serious issue." For example, the community practices the

method of 'poison-fishing' wherein they contaminate the river with poison. Although targeted at the capture of a good shoal of fish, continued poison fishing destroys the riverine ecology apart from further making the water inaccessible to the human population.

The community also does not maintain sustained cleanliness of its water resources. There is a need for generating awareness among the community about how crucial just water-use and management has become along with providing them information about the harm of using contaminated water for consumption and poison fishing. In this regard, the Panchayat should take steps to make the community aware and ensure proper management of water resources. In addition to this, there has also been an increased cutting of trees in the villages and its vicinity. Therefore, the interference of local governance in planting more trees is also necessary.

These steps towards achieving a just water governance would also address the issue of shortage of water faced by the community. Shortage of water for household needs and agriculture impacts prospects of livelihood adversely. In this regard, rainwater harvesting could be explored as a possible solution, taking lessons from a very successful rain water harvesting system adopted by Uttar Pradesh's arid neighbor - the state of Rajasthan. In addition to it, some short term and long term approaches could also be adopted by the community as well as through the Local Governance body. This could act as a viable solution to making sure that safe drinking water is continuously available to the communities.

Figure 8: Understanding the intricacies of water as a challenging need for the communities of Palia Kalan. Prepared from the cumulated narratives of interviews, focus group discussions and surveys in Palia Kalan, June 2019



Excessive use of groundwater for irrigation figures is another challenge to water conservation, management and governance. The community practices flood pump irrigation for cultivating sugarcane. This crop requires very high quantities of water for which flood irrigation is understood to be suitable. Excessive use of groundwater risks affect the underground aquifers and has long term negative impacts on the vital sources of drinking water. Since a major part of Kehri depends on sugar supply chains, it has direct and indirect influences on vital water sources in visible and invisible forms. The practices of irresponsible extraction of water either for irrigation or sugar manufacturing purposes add to the mismanaged municipal waste governance as well as because the town has been sprawling in eco-sensitive areas with inadequate recognition of voices from the marginalized communities.

Irrigation technologies like the sprinkler and the drip technologies are alternatives to flood irrigation but they are expensive and hence inaccessible to the majority of economically challenged villagers. Increased accessibility of the community to the expensive but water-saving irrigation technologies could be a governance intervention made in the community. A possible alternative could be to use surface water instead of groundwater, which will require the construction of canals for providing access to the fields, but given the drainage pattern of the Terai, it could be adopted in a smaller scale and is a viable alternative.

Figure 9: The practice of flood irrigation in the Palia Kalan region. The region cultivates sugarcane and wet paddy, both requiring substantial quantities of water.

Source: Photo taken during field work by Authors

The community also identifies flood as another challenge. Hydrological hazards are an impediment to livelihood, a disruption to daily life which severely damages life and property; sometimes also leading to mass displacement. Flood in itself is a colossal socio-ecological process and suggesting solutions and adaptive strategies for the same is beyond the scope of this report. Nevertheless, the community identified solutions to mitigate and manage these hazards are given below which may be considered by basin level planners:

I. Ensure timely warning about floods through establishment of an Early Warning System

II. Clear siltation in the river bed of the Sharda

III. Ensure a proper system of pre-flood planning and flood management machinery

IV. Provide livelihood options to the effected communities

V. The community should stay alert on the timeliness provided by the Community Water Club and Civil Society Organizations

Just like natural floods, drainage is another challenging issue for the communities of Palia Kalan. There is lack of sanitation and proper drainage among the villagers for which the local government can be involved for awareness generation among the communities. The industrial town of Palia has been exerting tremendous pressure on the environmental and human resources of the nearby villages because of irregular waste governance including municipal and industrial discharges in the river and its small tributaries.

The river ecology of the Mahakali and its auxiliary channels like the 'Sootea nala' remains severely disrupted which has also impacted the groundwater sources in the relative sense in the areas surrounding Palia Kalan. Among the most affected in this are women who have been traditionally entrusted with the responsibility of household management including the fetching of drinking water for the family. In addition, limited participation of women in local intervention on water contamination in Palia Kalan has excluded them from decision-making.

From the Community to Policy Makers: The Voices from the Community

In acknowledgement of the issue, the community is unanimous on the following pragmatic measures to act as possible pathways towards improving the quality of surface water and preventing further water contamination.

a. The sugar mills and the government need to acknowledge and respect the water rights of the communities inhabiting the Sharda river basin. Only in this way, a justifiable use of water by the corporate can be achieved.

b. The sugar mills should purify/recycle the waste generated in their industries and should ensure that the water is harmless before releasing it into the river.

c. Ensure accountability and co-operation of the corporate sector in dealing with the challenges of water contamination faced by the riverine communities on the banks of the Sharda.

d. Justifiable use of the groundwater by restricting unabated extraction of the groundwater by the corporate sugar factories.

e. Use the already contaminated groundwater as proof to justify demands for appropriate actions.

f. Implement strict adherence of the mandated government rules and regulations in manufacturing sugar.

g. Initiate dialogue between community representatives and the Government at the local level first, extend the issues and challenges faced by the community to the corporate through the local government.

h. Generate awareness among the riverine communities of the Sharda about safe drinking water.

i. The Village 'Water Management Committee' at the Panchayat level should address water related issues in their villages.

Figure 10: Below depicts sites of water contamination highlighting the challenges faced by Palia Kalan in achieving a just water governance

Source: Photo taken during field work by Authors

3.0

The Transboundary Community Narratives about Restricted and Managed Water of the Mahakali

Impact of Livelihood

Boundaries are often sites of conflict, disagreement and sometimes sites of violence in South Asia. The imagery of a boundary instils discomfort, confusion and mostly a fear of authoritative governance creating tensions in the lived spaces of border communities. The boundary between Nepal and India also exhibits similar patterns.

It is in specific sites of economic resources like the Banbasa barrage where the presence of the State in enforcing the boundary is displayed; in other scenarios, one can cross over from country to country without even realizing the 'boundary' because the geography is a plain field without any demarcations whatsoever. Mostly, small rivulets or highway roads demarcate boundaries between the Lakhimpur district of Uttar Pradesh in India, and Nepal. These are soft boundaries, where the communities are essentially transboundary in their connected livelihoods and overlapping religious and cultural beliefs. The border is a shared frontier space, where the imaginations of a hard boundary versus a soft frontier merges into creating the daily geographies of the region which is manifested very well in the form of a transboundary mobile population in the pursuit of livelihood.

The Sharda/Mahakali forms the administrative boundary between India and Nepal, assigning different governance structures to the communities of India and Nepal. However, the river unites the fisher-folk of both the countries because it acts as as a shared resource for fishing. The Banbasa barrage on the Mahakali is also the site from which various transboundary narratives obtain their conflicting forms. This barrage divides the river into anthropogenic channels of water, diverting volumes into the Indian State of Uttarakhand to be utilized in Uttar Pradesh, and another channel to Nepal before leaving the scanty water to run into the riverbed. The water control and management is governed under the Mahakali River Treaty between Nepal and India.

However, the resource sharing in such frontiers are good platforms to build international goodwill, but conflict and disagreements are almost ubiquitous realities that needs to be accounted for because they are intrinsic to defining the spatiality of the region. The water dependent livelihood space provides scope for community based participatory water governance which could be the foundation for water diplomacy between the two nations.

"We have a roti-beti relation between us. We give our daughters in marriage in India and recieve the same from India too. When we share our daughters, we also share our food, obviously. So, we are like a big family."

"We are no longer allowed to carry out fishing. Even though it's our river, we have no access to it."

- Conflicting narratives in the transboundary of Nepal and India

Figure 11: The Banbasa barrage on the transboundary region of Nepal and India. It is an open border between the countries and there is daily flow of population between the two countries through the path over the barrage. The control of water of the Mahakali is the major reason for 'conflicted' narratives by the communities in the frontier.

Source: Google Earth, as accessed on June 30th, 2019

Although there have been friendly ties between India and Nepal for ages in the form of exchanges and ties in various ways, some marginalized identities have been struggling in securing the livelihoods which they have been practicing for ages. Among them are the Suna community which used to earn their livelihood by fishing and sand-gold sieving activities. After The barrage invoked a system of controlled access to the water of the river, it resulted in intermittent availability of fishing opportunities. In such controlled access scenarios, the community has been forced to give up fishing as their primary occupation and explore other alternative sources of livelihood. The dry river bed however, still is the source of livelihood for the community. In the absence of fishing, the community has taken to sand mining and pebble-breaking activities. The struggle for securing their livelihood could be understood from the narrative provided below by a community member.

> *"The river which used to provide us more than we needed lies dry with pebbles in front of us now. We cannot fish because there is no water for the fish to live. And in the small channels where fish are present they are so inaccessible that we found it better to give up fishing altogether."*
>
> *- Suna Community, Nepal*

Figure 12 : Sand-mining and pebble-breaking as livelihood in the dry riverbed of the Mahakali. The river still constitutes the prime lifeline of livelihood for the community in Nepal. This is indicative of the fact that a river is more than its water and therefore water governance needs to expand its boundaries to take such spatiality into account.

Source: Photograph taken during field work

While traditional fishing has been compromised, there are new actors in town who have basic environmental ethics and yet continue to exploit the vulnerable geography of the Mahakali. The fishery industry in the upper basin has become highly mechanized and fishing is a contractual activity leased out to big commercial enterprises for ensuring efficiency in production and generating more profits by the private actors. This translates into exclusion for the fishing communities of both Nepal and India. The poor rural fisher-folk have no access to the river to fish and even when they get an opportunity, there is hardly any good catch. This has had a negative impact on the food basket of the community which had traditionally comprised of fish.

> *"These contractors clear the river of everything, they take the big fish as well as the small fish and leave nothing behind. That is harmful for the river ecology too."*
>
> *- Fisher-folk on the Indian side*

This situation is also reported by the fisher-folk of Nepal who reported that India has curtailed their access to their river. Another aspect of control faced by the Nepali community is through the defense personnel employed in the barrage and the border check posts. The border security personnel restrict the people from Nepal from accessing the river for fishing, which has, in exceptional situations also led to secretive fishing by the community members.

"The men in uniform do not let us fish in our river. They cite the reason to be 'security purposes' which means nothing to us. We are not a danger to ourselves."

- Fisher-folk on the Nepal side

For the Indian fishing community downstream, waste disposal on the Mahakali by the sugar industries is another negative externality which disrupts fishing. The waste is a toxic chemical which has led to the increase of cancer in fish in the river besides leading to increased deaths in the fish population. As a result, some fisher-folk have now turned to other forms of daily wage labor activities and some have migrated to other areas in search of a better livelihood. In the focus group discussions, members from the communities of both Nepal and India participated. The challenges and issues were discussed and some of the common challenges and solutions that emerged from the discussion are provided in the figure below:

Figure 13: Understanding the Shared Livelihood of the Mahakali: Challenges to Fishing as a transboundary occupation. Prepared from the cumulated narratives of interviews and focus group discussions with the communities of Nepal and India, June 2019

Water Stewardship and Disrupted Livelihoods in Nepal	1. Limited water available during dry season 2. High rate of outmigration due to changing livelihood patterns 3. Contractual monopoly of some private actors 4. Damaged crops due to floods during Monsoon 5. Information on early warning is being received very late 6. Reduction in the availability of fish and fishing is no longer a sustainable livelihood
Water Stewardship and Disrupted Livelihoods in India	1. Contractual Monopoly 2. Cancerous growth in fish from waste disposed by the sugar mills 3. Poison-fishing 4. Annual flooding by the Mahakali does not allow the construction of pond or tanks supporting pisciculture

4.0 The Path to a Better Water Stewardship

From the Community to Policy Designers: Voices from the Community for Better Livelihood

To explore the idea of water stewardship in the Mahakali River Basin it is also very important to understand the way the communities of both India and Nepal perceive the nature of basin level footprint issues in relation to their livelihood. Through a consultative process, communities on both sides were asked about the problems they face along with the solutions they think their respective government should consider as part of their responsibility in order to optimize water usage in a manner that better livelihood opportunities are generated for communities in both India and Nepal. Communities from both the nations were divided into groups and were engaged in group activities wherein they discussed the problems they face in the their socio-political and economic environments. One of the major objectives of this consultative process was also to build a sense of stewardship within the community so that they can comes together to solve their problems in an organized manner. Some of the recommendations by the communities of both the nations are shared below.

Identifying pathways to livelihood challenges faced by the transboundary community of Nepal and India in relation to their livelihood

- At the village level there are no ponds, therefore there is no opportunity for the poor to take up pisiculture. In response to this, tanks or ponds could be constructed with the involvement of the government (local and state) on both the sides for pisciculture.
- Contracts for fishing should be given to the locals. Refine the restrictive behavior of men in uniforms when it comes to fishing by the locals.
- Avail lands for construction of ponds for pisciculture in the dry areas.
- Sugar Mills should strictly adhere to the rules and regulations mandated for their waste disposal so that the communities dependent on the river resources are not negatively affected.
- Village Locals do not have the required resources to carry out fishing as an occupation/ livelihood. In response to this, tanks or ponds could be constructed with the involvement of the government (local and state) for pisciculture.
- Ensure that only the big fish are commercially collected so that there is a continuous availability of fish in the river which would help maintain the river ecosystem.

Source: Focus group discussion with the transboundary community

Policy matters concerning water stewardship requires a thorough understanding of the situation on the ground so that policies are more organic fulfilling the aspirations of the people. The idea of responsibility in state affairs especially concerning water is not new but nations are yet struggling to ensure a comprehensive people centric water policy. In order to ensure an effective governance of the endangered riparian resources and marginalized population living in critical transboundary geographies, it is also imperative that constitutional and legal provisions related to the governance of water are pragmatic and sustainable in nature. Some of the key points for preparing good water stewardship are highlighted by various UN and international agencies. They involve identification of major risks and opportunities in the transboundary basin, arrangement of finance and technology, capacity building, policy and institutional coherence, multi-stakeholder partnership, preparation of database, evidence based advocacy of community based water governance and water stewardship. This helps in influencing governmental policies effectively, motivating decision-makers to carry out innovative solutions, setting water targets, landscape management strategies like restoration, conservation and sustainable management to provide essential services like clean and abundant water supply, aquifer recharge, flood control, etc.

Water geographies of the Mahakali river basin have to be explored through the various dynamics of water sharing, mismanaged wastes and water pollution. Evidence from the current endeavor has brought to light the various narratives from the community on the urgent needs for regulating the activities of the private actors in the basin. It has highlighted the concerns that the transboundary communities on both sides have expressed on shared water resources thereby paving the way for a framework for exploring livelihood opportunities for the communities of the Mahakali.

In delineating water geographies of the riverine communities in this river basin, the report has brought out the challenges and concerns that various gender groups face in relation to water and how sustainable approaches in both the nations have not been realized on the ground in favor of the excluded identities who are kept away from decision making at various levels of governance. A solution to this could be achieved by ensuring participative and gender just water governance values which can not only ensure equity but can bring intrinsic changes in frameworks and paradigms. This approach should be adopted both at the micro and macro level with equal participation of women in policy design, planning and implementation of developmental initiatives in transboundary riparian areas. For this it is very essential that equal participation of all gender groups be seen as an intrinsic aspect of decision making and co-operation on shared resources.

The scenario of water quality in the Mahakali is alarming and the implications of the irresponsible footprint by various actors may have alarming impacts in the years to come. On one hand while sugar is a high water consuming product, on the other however, the supply chain traps the riparian communities in an exploitative labyrinth of dependency. Sugar industries not only impact water quality in the region but also influence the general livelihood of the people

because without this product which is responsible for the degradation of their neighborhood, the communities would struggle to earn a livelihood. Frequent flooding causes a big amount of loss for the sugarcane farmer as well and the impact is disproportionately felt by small farmers and livelihood groups from marginalized communities. Hence, a progressive step has to be taken wherein on one hand the livelihood of the farmers is secured and on the other, water quality is also not compromised at all.

Guiding points for Policy Designers and Basin Planners: Recommendations based on the analysis of people's lived experiences

Water Stewardship and footprint therefore has larger significance and while addressing a holistic basin level issue, it is important that we consider the various policies in both India and Nepal in an integrated manner. The following narratives emerge out of the various discussions with the stakeholder representing the concerns of both the countries which may be considered for immediate policy level discourses:

- There is interdependency between the two countries regarding their shared water resources which influences water policies to a significant extent. Since shared irrigation projects are crucial affecting livelihood of transboundary communities, both nations should engage in dialogue for a more equitable distribution.
- The infrastructural and institutional development of the bordering region is also a challenge for both the countries. The high rate of unemployment and loss of earning from the river due to various reasons is also a matter of concern for both countries. Hence both the nations should devise plans for promoting diversified livelihood catering to the needs of the communities in the border areas.
- Balance of national interest and water needs of the community is a need of the hour and both nations should endeavor to preserve their age old cultural ties and harness local potential for improving the overall governance of water resources in the basin.
- Private actors should be held accountable for their actions and progressive step should be taken for more efficient waste governance for the improvement of quality of water for various community consumption.
- Action on shared waters should be transparent, pragmatic and organic which demonstrates accountability and responsibility.

Ironically, from the corporate perspective stewardship is confined to the primary focus on damaging of crops and reduced water supply which hinders their production processes. Stewardship has been mostly understood by them as a state and community's responsibility. There has been very less discourse on the struggles of the community who not only supply them with raw material and labor but also compromise their general wellbeing because of the unaccountable and hazardous footprints of the private actors. In the sugar belt of the basin farmers often use harmful fertilizers in the pursuit of higher production which do not only have a detrimental impact on the quality of soil, but also have the potential to pollute water sources adjacent to the field. It is high time that the concerned private actors take responsibility and reflect accountability in their policies and action by restructuring their production processes and comply with state regulations. To achieve improved water quality, they should ensure more investment in efficient waste management and ensure that their production process does not harm the environment in any way. Understanding and evaluating the water cost of production is also helpful in devising further approaches towards the judicious use of the scarce resource. Through a participatory approach both the state and private actors should involve the community in decision making in matters related to production processes and pave the way for achieving the desired goals of sustainability. This will eventually lead to the strengthening of community based transboundary water governance regimes in the basin.

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