

Indigenous Knowledge and Technology in Water Management: An Empirical Analysis from Dhurwa of Bastar

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Abstract:

Water is an essential component on earth's surface for the existence of living organisms including human beings. Growth and development of major civilizations in the world have taken place on the banks of major rivers. Due to its significance, water is not only seen as a natural resource but as a substance that connects many areas of social life i.e., economy, religion, political organization, etc. Veneration of water in the form of gods and goddesses, and associated values, norms, customary practices are testimony to this fact. Tribal communities in India are not exceptional to this argument as water is chief source to sustain agriculture, animal husbandry, horticulture, fishing, and so on. Majority of tribes still inhabit in forest regions and lacks modern irrigation facilities for cultivation of crops. Availability of water is made possible by their traditional knowledge and technology in the form of age-old dikes, springs, tanks, ponds and nallahs.

Similarly, indigenous water harvesting resources such as *jua* (aquifer), *munda* (pond), *kuiyer* (channel), *tikener* (waterfall), *katta* (check-dam), *gutta* (puddle) are popular among the tribes of Bastar in Chhattisgarh. All these resources are made with natural objects such as stone, wood, and earth. Utilization and conservation of these water bodies are facilitated by customary practices, belief systems, taboos and restrictions.

With this backdrop, the present paper focusses on the role of indigenous water harvesting structures in harnessing livelihoods by Dhurwa of Chhindawara in Bastar and socio-cultural dynamics involved in water management. Furthermore, the study also highlighted their indigenous ground water identification, rain forecast, water storage at low laying areas, control of soil erosion, etc. With the primary data, the paper describes how the traditional water harvesting methods play an important role in nurturing and sustaining tribal communities. Different rites and rituals that are observed in tribal communities ensures collective action in sustaining water management.

Key Words: water management, technology, traditional knowledge, conservation, rites and rituals

Introduction

Tribal communities manage natural resources including water optimally through their traditional wisdom and technology. From the arrangement of farm ponds, dikes, dug-wells, aquifers, tanks, nullahs, etc., at village level it is evident that such structures ensure continuous water supply to fulfill day-to-day requirements and irrigation. These small-scale water bodies are responsible for the continuous availability of groundwater. It is a fact that major irrigation is scarcely available in tribal areas and hence they depend on small-scale irrigation for agriculture. But, the enormous growth of population, industrialization, deforestation and so on has severe impact on the existing water resources. To tide over the crisis, tribal communities devised an adaptive strategy in the form of sustainable utilization of water resources through in-built belief system and customary practices.

Thus, indigenous communities in India are managing the local water bodies very prudently through their age-old traditional knowledge and technology. This knowledge is inherent in their customary practices, traditions, belief systems, rites and rituals and in their cosmology. It is exhibited through the veneration of water bodies in the form of gods and goddesses, celebration of agriculture-oriented festivals, appeasement of deities during water scarcity, associated taboos and restrictions, etc. The concept of integrated sustainable water management is in-built in tribal areas by integrating socio-cultural and environmental aspects in water management for sustainable utilization. To protect water resources from over-exploitation, they attribute supernatural powers to water bodies and hence appeased them during auspicious occasions. Pacification of spirits was done in the form of rites and rituals in order to ensure a productive relationship with them. In the process of adaptation, these beliefs not only decide the utilization pattern but also regulate their usage against over-exploitation. Thus, cultural prescriptions and taboos are conserving the existing water resources in tribal areas. The scholarly studies on water management in tribal areas also reveal the symbiotic relationship between human existence and natural resources.

Rawat and Shah (2009) highlighted the customs of Kumaon bride to tie a sacred knot to water pitcher in absence of bridegroom as testimony to the significance of water resource. These customs and traditions relating to water led to conservation and recognition of common rights. But the

deforestation and urbanization have had impact on these water bodies. Similarly, Misra (2010) study on Koya and Kondareddi provided indigenous methods of bio-diversity conservation in the form of sacred beliefs in natural resources in the form of local gods and goddesses. The honour and appeasement of spirits i.e., *Gangalamma*(rivulet), *Bhimul*(rain god), and *Bhumata*(earth goddess) as well as annual festivals such as *gaddipandum* (grass festival), *kondapandum* (hill festival), *chettupandam* (tree festival), *adivirajulapandum*(forest), etc., nurturing the indigenous conservation ethics in their culture. Besides, the rites and rituals also ensure the collective behavior which is catalytic for sustainable management of natural resources.

Scholarly works of Arun Ghosh (1998), Himanshu Kulkarni (2009), Narayanan and Kamath (2012) pointed out the paradigm shift from large or big dams to small water storage structures and centralized governance to more decentralized systems i.e., community management. They pointed out that this community management resolves the problems of accountability, access, and equality. The studies undertaken by Agarwal and Narain (1997), Sengupta (1985), Patil (2006), and Vyas (2011) highlighted the significance of traditional water harvesting structures through case studies from different parts of India and highlighted the role of traditional institutions such as panchayat, user associations, religion, etc.

Keeping in view of these works, the present paper also attempted the documentation of traditional water harvesting structures of Dhurwa community in Bastar region and their management through traditional knowledge and technology. Prior to understand their traditional water management, it is pertinent to understand their socio-economic profile as it is crucial for management as well as conservation point of view.

Dhurwa: A General Profile

Dhurwa is a Scheduled Tribe of Bastar in Chhattisgarh. It is a sub-branch of Gond etymologically known as *Parj* which means carrying burdens. It is believed that in ancient times, Dhurwa used to move from one place to another to carry ghee, milk, curd and honey by *kawad* (sling). Apart from this, they carry the princes on *doli* from one place to another. Due to their occupation, they considered themselves as *Parja* of kings. Their mother tongue is *parji*. Their physical features are dark skin, flat nose, thick lips, strong body and simple stature.

Generally, two types of families are found among Dhurwa, such as nuclear and joint. The rule of lineage is patrilineal and patrilocal families are more. The families group together to form the clan. Every clan has its own totem and they do not harm the clan totem because they consider it as their ancestor. The people belonging to the same clan are considered as consanguine and therefore marriages among their children are restricted. Dhurwa depend on agriculture for subsistence followed by animal husbandry and collection of minor forest produce. They resolve disputes at a *chabutara* (meeting place) in the village, which is known as *tanageri* (traditional council) in local parlance. In which, village head men, *mata pujari* (mother priest), *mati pujari* (soil priest), *sirha* (native medicine-men), *kotwar* (messenger), *patel* (accomplice of priest) and *athpaharia* (temple servant) play an important role in dispute resolution. Their chief deities are *Bharwa Dokra* and *Bhandar in Dokri*. They celebrate different annual festivals such as *asamus*, *naya khani*, *diyari* and *amanuva* on diverse months and dates.

For the present study Dhurwa of Chhindawada in Darbha block in Bastar is selected. As per 2011 census, the total population of Chhindawada village is 4385. In which the number of men was 2162 (49.3 percent) and the total number of women was 2223 (50.6 percent). From the village census, it is known that the number of women is more than male. Chhindawada village is situated a distance of 35 kilometers towards the direction of Jagadalpur tehsil. This tribe has been residing in the mountains and forests from the beginning. They primarily dependent on nature and forest for their survival and hence they have developed a symbiotic relationship. As such they attribute various supernatural powers to hills, forests, and water bodies and appease them during auspicious occasions such as initiation of agriculture, collection of fruits, vegetables, minor forest produce, etc.

Objective of the Study

The main objective of the study is to document the Dhurwa's traditional water harvesting structures and conservation practices through the community rituals and social organization. Further, an attempt is made to test the Vidyarthi's man-nature spirit complex in the context of Dhurwa tribe of Bastar. Besides, an attempt is also made to highlight the traditional methods of recognizing water source, cultural mechanism of conservation, etc. **Methodology**

For the present study, the researcher selected Dhurwa tribe from Chhindawada village of Darbha block in Bastar. There are total of sixteen *paras* in this village like Mundapara, Junapara, Rampal, Kawaras, Padarpara, Mendabhata, Gonchapara, Permaras, Kokarras, Litipal, Koyanapara, Manjhigudapara, Ulipara, Dhurras, Jaamgudapara, Dhapanipara etc. Majority of the population belongs to Dhurwa along with non-tribal communities. The present study is mainly a micro level study based on both primary and secondary data. The traditional anthropological techniques such as observation, questionnaire, schedule, interview, key informant interviews are used during fieldwork. Further, books and journals, *grampanchayat* records, census department, etc., are also consulted as a part of secondary data. A door to door survey is also conducted to understand the demographic scenario of the study area.

Water Management of Dhurwa:

The study area is located in *dandakaranya* region which receive highest rainfall. Due to this reason, ground water is available within two to three meters from the surface. To harvest such ground water, Dhurwa developed many traditional water harvesting structures i.e., *jua*, *munda*, *dabri*, *kua*, pond etc., with their indigenous technology in Chhindawada. Their traditional water management methods are known as *pulkati neer guts* that are continued till date with elaborated rites and rituals. Water plays an important role in their socio-economic and cultural life as no ceremonial act is completed without the use of water collected from earmarked aquifers. Due to its significance, they attribute supernatural powers to such water bodies i.e., *singhrajju* and propitiate them during *jatraor mela* (annual festival gathering), *madai* (festival gathering once in three years), and festival time. Prior to understand this symbiotic relationship, it is relevant to mention the traditional water harvesting structures of Dhurwa.

Traditional Water Harvesting Structures:

***Jua* (Aquifers)**

It is a ground water aquifer which is having 5 to 10 feet in depth and 2 to 3 feet width in a round shape found in midst of dwellings and agricultural fields. It is encircled with wood or stones that resemble like a small well. The stored water inside this hollow structure is used for several purposes i.e., drinking, washing, bathing, farming, etc. It is a traditional method of water storage

resorted by Dhurwa since ages. Based on its size, shape, structure, and location it is known with different names such as *vaya jua*, *bulka jua*, *singhraj jua*, *kalasuri jua*, *laakdi jua*, *junapani jua*, and so on. Its utilization differs in rainy season as the *jua* water overflows to become a *nallah* which is diverted to irrigate agricultural fields and finally stored in pond.

Munda (Pond)

It is a man-made water reservoir having 10 feet deep and nearly 10X5 meters width simply with the dug-out earthen soil. Dhurwa generally construct two types of *munda* i.e., storage of rainwater at low laying area (small size) and another one is locating at a corner of agriculture field (big size). Besides irrigation purposes, *munda* is also used for fish rearing, percolation, flood control, silt capture, and ground water recharge. Water stored in such *munda* are supplied through a manually made channels to the fields located on its catchment. These channels also cover nearby agricultural fields. flood control, silt capture, etc. These *mundas* are playing important role in the lives of the Dhurwa as its water is also used for feeding the cattle as well as their daily requirements. They differentiate each and every *munda* of their area based on its shape, size and usage and name them accordingly like *vaya munda*, *pata munda*, *bhosa munda*, *khera pokala munda*, etc.

Jharna (Waterfall)

When the *jua* is overflowed in uplands are fall from top to down like waterfall. The place at the bottom where water fall make a small *kund* (water stored place) which is known as *tikeneer* in Chhindawada village. Dhurwa consider that *jharna's* water is medicated as it touches many medicinal herbs while reaching its *kund*. Different varieties of trees are found in its surroundings and the water gets cleaned by the bark of those trees. Wooden pipes made with bamboo are attached at the far end of the *jharna* through which water is collected at *kund* in such a way like tap and this water is used for drinking purpose as well as for farming. Dhurwa believed that *kariausi dev* resides in this *jharna* and worshipped in the form of black lion that is considered as savior of *jharna* and forests.

Nullah (Channel)

Dhurwa make man-made water channels connecting catchment fields with the overflown *jua*'s water known as *chhirwa* in local parlance. In the catchment of *jua*, fields are arranged in step wise in such a way that overflown water is flown to terraced paddy fields. They believe that continuous supply of water enhances the fertility of soil and hence busy in making channels during leisure. Dhurwa use flat stones, bamboo made fencing, sand bags at appropriate place so that water is systematically flown to reach the tail end farmers. Keeping in view of its significance, now administration is making *pucca* channels with cement and stones for the better yields.

Pokhar (Puddle)

It is also popular as *dabriin* local parlance which is a smaller structure lesser than a pond. It is made manually with simple tools such as *gaiti* (spade), *rapa* or *favda* (hoe), *tagaadi* (metal basket), *sabbal* (rod with flatten end) and bare hands in agricultural fields to recharge the ground water and thus provide moisture to the crops. Rain water gets accumulated in puddles during the monsoon. Another reason for making such a small pond is to cater the water requirements for their cattle. Fishes and vegetables are grown with the help of puddle water.

Thus, rain water is harvested with the above stated traditional structures and managed to irrigate their fields through well connected *nallahs*. Based on the availability of water, Dhurwa classify the agriculture land for different purposes like *upajau* (low laying embanked land), *maraan* (relatively levelled dry land), *baari* (fenced inland laying adjacent to homestead), *meta* (forest), *banjar* (cattle grazing), hilly uplands, etc. The *upajau* lands are exclusively used for paddy cultivation which is always wet and retain sufficient moisture as they are close to water sources like *jua*, *munda*, and puddle, etc. These *upajau* fields are irrigated during the rainy season by these traditional structures. *Maraan* lands are suitable for other crops such as *urad*, *mung*, and *arhar* sown in June-July and harvested in November-December. The *baari* lands are used to cultivate oil seeds, pulses, vegetables. The crops in *maraan* and *baari* are rainfed as some of the households channel the used water for vegetable cultivation. The rest of the lands *meta*, *banjar*, and hilly uplands are totally rain fed.

Traditional Knowledge of Water Management

In Chhindawada, majority of the aquifers are five to seven generation old. Some of them are built very recently also. For locating the water source, they rely on traditional practices such as coconut, bamboo, *jamun syzygiumcumini*), *doomer (ficusracemosa)*, etc., that are discussed below in detail. Even now, Dhurwa built such aquifer with handmade implements such as *favda*, *gaiti*, and *kasela* (mug). After identifying the source of water, they start digging of the place with *pavda* and the mud mixed water is removed through the *kasela*. They dug a pit upto three to five feet in deep and two to three meters in width. The *dongarbaas* (a variety of bamboo) is used as scale to measure the depth of the pit intermittently. After completion of the digging, *sargi* wood or stones are inserted into it to avoid the fall of surround mud in water. Generally, aquifers are constructed near to the mango, *chhind (phoenixacaulis)*, and *sargi (shorearobusta)* trees as they consider that ground water is abundant at these trees. Further, it is also believed that roots of these trees purify the water and hence amenable for drinking. In case, aquifer is made in open place, they used to plant these trees surrounding to it. Main reason behind this plantation is that these trees lessen the salt properties of the water in those aquifers. The red soil is considered as appropriate place digging aquifer by Dhurwa.

To make *munda*, Dhurwa prefer two type of lands such as marshy and dry land. In first case, it is believed that ground water level is more and hence water is stored for a longer period. The later type of *munda* is made on dry land especially during pre-monsoon period so that monsoon water is used for *khari* crops only. To make this structure, Dhurwa use *pavda*, *gait*, *sabbal* and *kawad* (sling). The unwanted stones in the place are removed through *sabbal* and *kawad* is used to remove the earthen soil. Nearly about ten to twelve knowledgeable persons are engaged for a period of two to three months. It is having eight to ten feet depth, 40 meters in length and 40 meters width. Thus, man-made *munda* can last upto fifteen to twenty years. But it is mandatory to deepen the *munda* with *pavda* once in five years as a part of removal of sediments. Thus, removed soil is transported to fields for manuring purpose.

Even now, Dhurwa dig *kua* (well) manually with 10 to 12 persons who continuously engaged during summer. Water is available within a range of 10 to 15 feet depth. In case of rocky soil, water is found upto 20 feet. The width is generally about 30 to 40 meters. Tools like *pavda*, *gait*,

sabbal, *tagaadi* and *balti* (vessel) are used while digging the well. They use stones at the basement and sides to prevent the mix of the mud. They also keep local variety of fish such as *mongri*, *taru*, *kothri* to purify the water in it.

Dabri or *puddle* is arranged in agricultural fields for optimum utilization of excess *jua* and *munda* water. Generally flat land with red soil is preferred for making the *puddle* by Dhurwa. The overflowing water of *jua* is channeled through *kutchanallah* (manually made *nallah*) with a range of one- or two-kilometer distance. It is made by ten to twelve persons with the embankment of field soil for a period of fifteen days to one month. It is having five to six feet depth, 15 to 30 meters wide. Thus, man-made *dabri* is intact for five years and can be revived with minor repairs with *pavda* and sling. The minor repairs are undertaken during April or May month i.e., prior to monsoon.

Indigenous Ways of Forecasting the Availability of Water

Dhurwa follow ingenious traditional methods for identifying the location of water source. Once the plot is selected by a knowledgeable person, then they dug-out the well or aquifer. Prior to undertake the water testing, *pujari* conducts worship with bare feet at the place and made a sacred trip in the fields by holding coconut in their palm in different directions.

Testing with *Nadel* (Coconut)

To identify the source of water, the priest holds the coconut horizontally on stretched right hand palm and walk towards the eastern direction of the plot. They believe that the moment water table comes beneath the feet of the *pujari*, the coconut starts rotating or erecting. Then they earmark the plot and starts digging at that place. This practice is widely prevalent not only among Dhurwa but also among the tribes of central India as well as caste Hindus prior to making a new well or bore. Apart from coconut, Dhurwa also use *naadkul meri* (*jamun* twig), *neem* twig, and *vedri* (a piece of bamboo) in place of coconut for testing the water source in similar to the coconut testing procedure.

Further, Dhurwa also predict the rain by observing the behavior of trees, termites, frogs, birds, and ants. This prediction is generally made by *mata pujari* through magico-religious practices.

Prior to initiation of agricultural works or ceremonial offerings, Dhurwa observe the following methods to predict the rainfall.

Charungi Meri (Sargi Twig)

Dhurwa believe that *sargi (shorearobusta)* tree is a symbol of their *kuldevi* (clan deity) that had some miraculous powers. The blossoming of *sargi* tree is observed to forecast the rain. Dhurwa believe that in case all the leaves of *sargi* tree falls and a new one grow at the bottom indicates that early monsoon. If the new leaves grow in the upper portion of the tree, it indicates the delay of monsoon. If new leaves are grown in middle of the tree, it means that rains will be on time. As such, Dhurwa start observing the mature *sargi* tree at the end of summer for beginning of agricultural operations.

Baramasi Bird

Baramasi birds are plenty in the study area that are also known as *lavaor pandaki*. This bird keeps on erecting nests at different places in the forest and Dhurwa believe that it forecast the quantum of rainfall in particular direction. In case it arranges a nest on a tree and just opposite direction of the entrance of the nest receive the highest amount of rainfall.

Putkaal (Termite or Ant Hill)

Where ever the mud structure is formed by termites and the mound soil has water vapour, Dhurwa believe that there would be plenty of underground water. They select a place near to such mound for making a new aquifer and thus newly built *jua* near to termite mounds are known as *dengur jua*. Due to this reason, snakes and termites made these mounds as their abode.

Nedil (Soil)

During rainy season, a person walks on the dried *meed* (embankment) of the agricultural field. In case the soil pressed inside the earth, it is predicted that underground water is available at the place. Otherwise they consider that water is not available at the place. Further, they also believed that in case a smoke comes out from the earth soon after the rain, they predict that underground water is plenty at that place.

Dhol Dongri

A small mountain in Chhindawara is known as *dholdongri* from where people used to watch the Dussehra festival. When *dhol* played by Dhurwa for this festival, people used to gather over the *dongri* to watch the festival. On this hill, a special hole is found on a megalith where crab lives. If the rain water fills the hole, the crab came out with water and it is considered as symbol of good rainfall, otherwise, Dhurwa believe that drought may occur.

Cultural Mechanism of Water Conservation

Since water is essential for Dhurwa survival, they have developed a cultural mechanism in the form of beliefs, taboos, and rituals to conserve the above-mentioned water harvesting structures. Breach of taboos may cause the wrath of the deities that would result in an outbreak of epidemics. Thus, the beliefs and restrictions are playing crucial role in reducing competition in over exploitation of water resources in the study area. It in turn preventing the pollution and allowing the regeneration of water bodies. The individuals undergoing life crisis such as birth and death, menstruating women are considered as polluted and hence observe avoidance. During ceremonial occasions, they do not venture these water bodies to fetch the water. In case, they breach the rule unknowingly, a rectification ceremony follows during first fruit ceremonies, *melas*, and *madai*. Besides, they do offer *puja* to Lord *Bhima* (one of the Pandava's brother) for continuous availability of water.

Worship of *Bhimsen*

The symbol of *Bhimsen* is *aaasan* (broad sitting platform made with *sargi* wood) among the Dhurwa community. Near to this symbol one *kudahi* tree is located which is known as the residing place of *bhimsen*. In case of no rain in the village, Dhurwa perform the marriage ritual of *bhima-bhimin* to please rain god. It is observed every year in the month of *bhadon* (September) on the Tuesday at *Bhima dev* temple. For this *jatra*, the headman of each household brings *purana chaval* (old rice). For this *puja*, *mata pujari* worship the *bhimsen* with vermilion, coconut, incense sticks, egg shell and *hajariflowers*. Prior to this *mati pujari* arrange a *macha* (small *pandal*) with the *dongar baasat* the *aasan* of *Bhimsen*. It is known as *chopal*. Later on, he keeps the *purana chaval* at the two front legs of *aasan* and performs *puja*. After formal worship,

the *mati pujari* sacrifices a white cock and black pig at the spot. Dhurwa consider that white cock is a symbol of water and black pig is a symbol of soil. After completion of the *jatra*, Dhurwa start harvesting the crops and consume the traditional dish made with new rice, *urad* (black gram), and *til* (sesame) along with *phenda baaji* wild vegetable leaf). The main objective of this *jatra* is to protect the village as well as agricultural field. For this, people bring old paddy, *mandia* (finger millet), *urad*, *til* in a cup made with *sargi* leaves to this *jatra*. After completion of *puja*, *mati pujari* distribute them to gathering in the form of *prasad*. Though both men and women participate in this *jatra*, the sacrificial food is consumed by men only. However, the sacrificial head of the buffalo is consumed by *mati pujari* and *mandarin* (musical instrument) players. If there are no proper rains in the year, the village headman organizes a meeting with *manjhi*, *mata pujari*, *sirha*, *mati pujari*, *kotwar*, *patel* and all the villagers decide the month and date for the *jatra*. *Bhima jatra* is observed once in three years by contributing generously and performed for three days. Besides this, Dhurwa offer worship *BhimaDeve* every year for good rain and harvest.

Raathmai Jatara

Dhurwa observe a big *jatra* known as *raathmai jatara* at the sacred place of *Bhimsen* once in twelve years. The typical feature of this *jatra* is performed during night only. According to their folklore, once there were only twelve Dhurwa *paras* in the area and they are surrounded by dense forest. To protect them from the water scarcity, Dhurwa started celebrating this *jatra*. Due to this reason only, this *jatra* is performed once in twelve years in the month of *aaghan* (November-December) on Wednesday night between 10 to 12 pm. For this festival, *kichak pujari* (authorized priest for *raathmaijatara*) brings water at 8' O clock in night from the sacred *singhraj jua*. As a part of worship, he offers *hajari* flowers, egg, and incense at the *singhraj jua* and brings water in a small pot. The cow dung is mixed with in the water collected from the earmarked *jua* and smear to the symbol of *Bhimsen*. Later on, he worships the *Bhimsen* with vermilion, *hajari* flowers, banana, coconut, and twelve eggs representing the twelve original *paras* and for twelve years. While performing *puja*, the priest offers *mahuwa mand* seven times to the *Bhimsen*. The twelve eggs are given as a part of food to *Bhimsen* for twelve years. Then he sacrifices a *kala chowki* (black chick) and a *chitkabara* (a white spotted black chick), a white

cock, and two black pigs at the place. Thereafter at 12'O clock in the night, *pujari* sacrifices a red cow or oxen to *Bhimsen*. The head of the sacrificed cow is buried under the *kudai* tree and keep a big stone. Here participation of women is strictly prohibited. The main objective of this *jatra* is to ensure continuous rainfall, peace and prosperity and protection of the *paras* from the droughts etc.

Worship of GramDevior Devta

Apart from these *jatras*, Dhurwa do appease different gods and goddesses for continuous availability of water. Every *parawas* inhabited by *gram devi or devta* who is personified as *mauli mata*. The tutelary deities of their *gramdevi* are mainly *pardesin mata, hinglajin mata, tiranta mata, kankalin mata*, etc. The headman of every Dhurwa household offers worship on auspicious occasion to these deities for their favour in obtaining better yields. Some of the places are earmarked as sacred groves and certain taboos and prescriptions are attached to it. Hence, Dhurwa are prohibited to exploit resource in such places where these supernatural beings reside. Trespass or cutting of trees may invite the wrath of the deities which is expressed in the form of illness or drought. Hence, Dhurwa pacify these deities while collecting resources from these sacred groves such as bamboo, hardwood, and water.

Social Institutions and Water

Further, social institutions of Dhurwa such as family, clan, and political council are catalytic in access and conservation of water resources. Observance of *neerchapanapuja* at aquifers while collection of water for celebration of marriage. *Pannek jua* and *sulel jua* are earmarked aquifers for collection of water to the ensuing marriage ceremony in the study area. Without this sacred water, no marriage ritual or process is officiated by the Dhurwa.

Prior to the marriage ceremony, Dhurwa erect *pandir* (pandal) and all the consanguine relatives assemble there. *Matipujari* offer rice and egg to the *pittarmata* and sacrifice a chick there. He keeps the head of the sacrificed chick besides the egg and the blood is sprinkled seven times on the soil besides *mahuwa* offering in *sargi* leaves. Then the sacrificial head is washed in *jua* water for purification. The last year *mahuwa* dried flowers are mixed with *jua* water in a *dona* (leaf cup) and prepare a kind of *prasad* which is known as *pey*. Later on, they sprinkle *landa* (rice

beer) and *mahuwa* seven times and pray the *mata* for the protection of new bride who is coming to their home. The eggs are broken after completion of whole marriage process. Thereafter, they keep *jua* water, *landajohra*, musical instruments (*dholak*, *jalajal*, *girgicha*, *verot* or flute), one bottle *mahuwa*, *sulfi*, and *sargi* leaves at *mandap*.

The belief system relating to death reveals the significance of water in Dhurwa life. In case pregnant women dies, they bury the dead body after crossing the pond or river believing that spirit cannot cross the river. This custom of crossing river demonstrates the magical powers of river water that prevent the dead spirits to enter into the village. Even the deaths due to accident or illness are cremated in fire and the ashes are immersed in water bodies for not becoming the spirits. They collect water from earmarked aquifers for purification of house soon after the funeral. After disposal of the dead, all the relatives, villagers including family members take bath in the river and then enter the house of the deceased person. Later on, purification of the house with ritualized *kasapaani* (ritualized water brought from *Jua* mixed with bark and leaves of mango, jamun, mahuwa, etc) and *toratel* (oil made from *mahuwa* seeds) to the visitors of the dead.

Traditional *panchayat* and *para* elders such as *sirha*, *patel*, *atpaharia*, *matipujari*, *matapujari*, *devpujari*, and so on are crucial in resolution of water related problems in the village. The member families in each *para* have usufruct rights over such water resources and these resources are used for their subsistence purpose not for the commercial. Since these traditional water harvesting structures are fulfilling the water needs of all the villagers, they collect money for its maintenance and offer *shramadaan* (free manual labour) as and when required. It is their responsibility to control its members for its optimum usage and also coordinate the different activities of *parajatra* or *madai* from time to time.

Beside this, the Council also dealt the offenders by adopting stringent measures so as to restrain them from indulging in destruction or pollution of individual or communal *jua* or *munda*. Generally, fines are imposed in the form of snatching livestock and throwing feast to the community. Due to the fear of loss of livestock or punishment, they do not dare to commit any offence thus resources are protected from over exploitation or pollution of water bodies.

The Council also assists Dhurwa in reunion of the eloped couple with their respective families by the process of *suddhikaran*. In such cases, head of the family first consult *mati pujari* and inform his relatives about the proposed reunion in the community through the process of purification. All the relatives including *mati pujari* assemble at the concerned household for this act of reunion. Then *mati pujari* brings water from *sulel* or *dongapani jua* and sprinkle over the couple to symbolize their marital knot. Further, *mati pujari* bring soaked rice in a *dona*, an empty pot and egg. The pot is filled with *dongapani jua* water and offered worship to *Singhraj dev*. Then he breaks the egg with a knife and offer to the deity for the success of the marriage. After this rite, Dhurwa accept the couple as married otherwise they will be socially boycotted from the respective families or village.

Further, the role of water can be seen in the annual festivals such as *amus. haryali, nayakhani, koltel, diyari, amanuva, medi*, etc. Various gods and goddesses are worshipped on these festive occasions for good harvest, grain storage, protection of the village from evil forces, diseases, and continuous availability of water through good rainfall, etc. Appeasement of deities during these festivals reflects their belief in supernatural beings that are believed to live in natural resources and control Dhurwa from over exploitation. In case they violate any taboo or cultural prescriptions, it is believed that misfortunes may occur in their family, village or society. As such, a symbiotic relationship with the water resources is still maintained by Dhurwa through the medium of sacrificial worship to their gods and goddesses from time to time.

Conclusion

Thus, the traditional water harvesting structures such as *jua, munda, dabri* or *puddle*, and *nallah*, etc., are ensuring water related livelihoods and survival to Dhurwa in the study area. Access and continuous supply of water is being facilitated by the age-old traditional knowledge which is transmitted orally from one generation to another. Further, belief systems such as testing underground water source with coconut, sargi twig, Dhol Dongri are fashioned in such a way that they help in forecast of water resources for their consumption. Dhurwa also believed that their deities exist in the form of natural resources such as forest, mountains and rivers, ponds and control the ecological, environmental and climatic conditions. The worship of Bhimsen and

performance of *rathmaijatra* is testimony to this fact of view besides worship of *singhraj*, *kalasuri*, *bhandarain* deities. Further, the role of water can be seen in the performance of marriages, funeral rites, life cycle and annual rituals. The traditional council of Dhurwa is catalytic in access of water resources and dispute resolution. Thus, traditional knowledge and technology of Dhurwa is facilitating the successful management of water resources and its related livelihoods.

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