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Environmental Injustice in the water Sector in Sri Lanka

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Abstract. An increase in water requirements with climate change has become a burning issue in South Asia. Over 2 billion people experience high water stress at present. According to UN predictions, by 2030 from 24 to 700 million people will be displaced by intense water scarcity experiencing a shortage of access to sufficient quantities of water for human and environmental use. The hydraulic empires of Sri Lanka in the past in Orient societies had been concerned about water conservation and storage to use during water shortages and to develop irrigation systems. They enforced their power and bureaucracy extensively to develop the waterworks systems with great skills and technology and water management model. At present, free-flowing water has become a profit-generating mechanism, creating injustice and inequalities in the water sector in Sri Lanka. Due to Inequality in water allocation, distribution, and access to water resources have made social inequalities making opportunities for the affluent class to gain, waste, and exploit water resources while have-nots lose and struggle leading them to poverty and social breakdown. With globalization and modernization, depletion of natural resources brought devastating impacts on marginalized communities making conflicts between human and environmental resources. With the human interaction of the global biosphere, marginalized communities who are least responsible for the pollution and degradation, undergo environmental injustice by experiencing the global environmental consequences as a result of rapid industrialization and resource exploitation at global and local levels. The main objective of the study was to explore the discourse of environmental justice in the water sector in Sri Lanka. The study is based on both qualitative and quantitative data. Content analysis of the relevant literature, informal discussions, and observations were carried out. Environmental injustice occurs when unequal societies place most of a load of environmental damage caused by development on low-income populations, discriminated social groups, disadvantaged communities, traditional ethnic communities, working-class, marginalized, and vulnerable populations. Also, Environmental injustice makes developing countries suffer from limited environmental resources creating inequalities in natural resources between countries and societies. Environmental inequality and political economy are interrelated and a global phenomenon. Trade, transfers of wastes, trade-in toxic waste, and climate change expand the injustice where value is accumulated only by one party while deepening and distributing global environmental risks to the other. As a response to these environmental inequalities, injustices, and racism, adequate attention was given beyond national boundaries on sustainable resource conservation to eradicate socioeconomic environmental inequalities. Communities live in hazardous and unfavorable conditions based on race/ethnicity, social class, gender, age, and location seem to be affected by environmental burdens and, in contrast, mainstream environmentalists began to focus on sustainability and conservation, which raises issues on the fairness of humans' treatment of the environment.

Keywords. Environmental injustice, inequality, water resources, women and water

Introduction

Sri Lanka had been a water-rich country with an advanced hydraulic civilization and systematic water conservation. 'Hydraulic civilization' which had been in Oriental societies was believed to rule by hydraulic empires who managed the irrigation development extensively. Economic development became significant in managing the irrigation systems as K.A. Wittfogel (1981) described in the 'Oriental despotism' approach. Therefore, using absolute power, the empires controlled the distribution of water ensuring equality to all farmers while developing a labor force for the sustainability of the irrigation system. Irrigation became the main factor to originate the power-centered political authority and it helped to develop the early hydraulic civilization in Oriental societies. Therefore, the political structure of the oriental societies influenced for the development of hydraulic civilizations in the past. Control flood and access to water were done with the help of administrative systems while imposing power on citizens to maintain control over access to water and conserve it (Brohier, 1934).

In the modern world, the systematic environmental conservation and water governance have become a challenge due to the fact that many countries undergo regressive financial burdens. It threatens the competitive economic development while threatening the survival of human beings. The contemporary world is experiencing many environmental and climate change crises creating socio-economic and political issues in society. Environmental degradation, depletion of natural resources, climate changes, natural disasters, human-wildlife conflicts, and water poverty are leading environmental issues to encounter at present in Sri Lanka while experiencing severe socio, economic political consequences.

The country is in deep struggle looking for solutions for deliberately created environmental problems by few which cannot be reversed or regenerate. As a result of these issues, there are many concerns regarding ecological democracy and the environmental rights of people as it is considered that every citizen has a right to clean air, water, etc. Today, the discourse of ecological justice and environmental discrimination have laid the foundation for the emergence and functioning of environmentalism or environmental movements.

Water as the most valuable natural resource has become the focal point of many environmental movements in the world. According to Shiva (2002), water-based development projects are the sites of conflicts and there are many forms of hydro wars and ecological terrorism in terms of water. Thus, the discourse of environmental justice is mainly located in the context of hydro politics and water poverty.

The main objective of this paper was to explore the discourse of environmental justice in the context of the water sector in Sri Lanka. No life is assured in the absence of drinking water. Water is also supposed to be one of the key factors that determined the livelihood of people among the farming community especially in the dry zone of Sri Lanka. Moreover, the sanitary fulfillment and everyday life of people totally depend on available water sources at the household level. It decides the lifestyle of people and determines the workload of women in many societies. Access, ownership of water sources, and use of water for drinking, livelihood, and daily sanitary requirement are a significant part of the ecological justice of water. Thus, this paper attempts to explore the ways that water-based ecological justice is met in the life of people in terms of drinking, livelihood, and sanitary purposes.

Sri Lanka is at risk of water scarcity as a result of climate change, water exploitation, and pollution apart from factors related to geographical and agricultural economic developments. The country is sensitive to fragile water systems and limited water resources and it is predicted that Sri Lanka is likely to experience severe drought in near future. There is an increasing trend in annual air temperature, and exceptional variations in rainfall patterns (World Bank Group, 2020). As a result, the country experiences variations in weather patterns which

in turn leads to water issues by increasing the intensity of rainfall, flood and drought, forest fires, and human-animal conflicts causing a conflict between life and death of the communities. In 2016, a significant increase in high rainfall was reported, causing severe flood condition, displacing a large number of people as 'Environmental refugees', in turn affecting the water quality of drinking water sources by directly polluting and destroying the water sources (Global facility for disaster reduction and recovery, 2017). Also, on the other hand, risks and uncertainties as a result of these disasters have led the communities and environmental refugees to encounter socio-economic and psychological shocks and stresses as well (Makwana, 2019).

Methodology

The objective of this research was to conduct an empirical study to provide an in-depth analysis of environmental injustice in the water sector in Sri Lanka. The secondary data and information as per the research objective were collected from the government agencies of Sri Lanka and referring different journals, reports, and books. Content analysis of publicly available data and semi-structured interviews were used to gather qualitative information. The study was aimed to analyze the content of records, incidents, newspaper articles, documentaries, and archival records systematically and objectively, identifying specific characteristics of messages which related to the research objective. All the records were classified and analyzed according to a structured criterion. The primary data was collected through semi-structured interviews with a purposively selected sample of 30 participants with an equal number of males and females. The primary data collection was done as per an interview guideline to collect the insights of the issue while conducting key informant interviews. The collected data were quantitatively analyzed based on the themes and discourse used in the field of sociology of natural resources and political ecology.

Water Resources in Sri Lanka: a historical overview

Even before the third century B.C, Sri Lanka had been marveled in hydraulic civilization with engineering technology and water resource management. Waterwork systems were advanced with great skills and technology and water management models, such as canals and tank cascades were used not only for irrigation and agriculture but to maintain ecosystems for water availability throughout the year. Hill streams were blocked and guided to storage tanks where water was taken to larger tanks through water channels from the storage tanks. Nearly 20,000 village tanks and reservoirs were sustained from rivers in the country. However, people were depended on rainwater and cultivated large lands, constructing reservoirs and tanks in dry zones. *The Minneriya tank* covers nearly 1900ha and *ParakramaSamudraya, Mahakanadarawa tank, Kalawewa* were constructed as storage reservoirs obstructing run-off to the sea. *King ParakramaBahu* was never let, "even a small quantity of water obtained by rain, go to the sea, without benefiting humans" (Brohier, 1934).

However, since these reservoirs were insufficient due to the high demand for water with the growth of population after 1948, the *Gal Oya* scheme which is the replica of the Tennessee Valley Development Project in the U.S.A was introduced. The river was dammed and converted into a tank which is now called *Senanayake Samudraya*. On the other hand, *Mahaweli*, which is the longest river in the country initially diverted during the construction of Yoda-Ela. In 1961, the Mahaweli development programme which was known to be the largest multipurpose national development programme in the history of Sri Lanka was introduced. At present, it is estimated that there are nearly 73 major irrigation reservoirs, and 160 medium-scale reservoirs available in the country. Minor scales reservoirs are over 10,000 and the island is prosperous

with more than 20 major wetlands. Also, seven unplanned hydroelectric reservoirs cover over 8000 ha in Sri Lanka (Muller & Hettige, 1995).

Nevertheless, “Of the total volume of 120,000 mcm rainfall received in Sri Lanka, 10% is used for irrigation, 6% for domestic and industrial purposes, while about 23% of the total volume escapes to the sea as runoff through 103 river basins and 54 small drainage basins which cover 90% of the country. The amount of surface water indirectly available is nearly 36%. The remainder is lost as evapotranspiration” (Climate change secretariat Ministry of environment, 2010). Around 60% of rainwater in the wet zone is a runoff to sea and in the dry zone it is estimated that 35% to 40% per year is discharged to sea unutilized by people (UNESCO Sri Lanka et al., 2006) due to the mismanagement.

Hence, at present, risks and issues have been encountered in the water sector, and many experience drinking water issues in quantity and quality in Sri Lanka despite being a water-rich country of having several large reservoirs and rivers.

It is estimated that safe pipe-borne water coverage is 50.5% on the island (Ministry of City Planning and Water Supply, 2018). Changes in precipitation could be observed during past years as wet areas become wetter and dry areas become drier causing excessive flooding and droughts. Moreover, rapid urbanization has led to contamination of water, unsustainable agriculture practices, and untreated wastewater discharge, and depletion of water sources. The finding revealed that untreated water is directly discharged to the Mahaweli and Kalu rivers, which is the main water intake in the country in turn threatening humans as well as biodiversity. Moreover, since the groundwater originates as precipitation, mainly in the form of rains, unseasonal rain patterns have caused disturbances in quantities in water in wells, streams, etc. These kinds of climate variability and extreme weather conditions, in turn, decline productivity and crop yields and also impact access to reliable drinking water as it reduces the water supply (Turraletal., 2008). Furthermore, the content analysis and in-depth interviews revealed that it leads to devastating economic and social disasters, such as famine, forced migration away from drought-stricken areas, and conflict over remaining resources. On the other hand, farmers are dragged deeper into poverty and food deficits resulting in indebtedness in unable to cope with climate risks.

Access to water sources

During the dry period, which run-through several months of the year, Sri Lankan farmers experience severe water shortages. Climate variability and extreme weather conditions, reduces the water volumes and water supply impact in access to reliable drinking water as well as declining productivity and crop yields (Withanachchi et al., 2014). According to the findings, this condition has to lead to economic and social disasters, for instance, forced migration away from drought-stricken areas, and conflict over remaining water sources.

The findings revealed that paddy farmers who withdraw agricultural water from reservoirs are constantly in competition and conflict with fellow farmers over water use in the reservoirs as the water resources are overcommitted. Opportunities are available for headman of the villages and the wealthy farmers to withdraw water from lakes and agro-wells to the paddy cultivations whereas poor farmers are not. These reservoirs and wells cannot provide water to meet the demands of the paddy cultivations. Hence, frequent suppression of powerless farmers and their unresolved social stratified suffering often lead them to obtain micro-loans in turn leading them into debt. It is evident that inequality in water use based on social power, bureaucracy, and poor governance in agricultural water distribution is the most common scenario in the farmer community. The distressed farmers are in agony as they are constantly in never-ending poverty and debt crisis.

The bulk water delivery services are often offered by private water vendors in the dry zone areas, selling a water liter for Rs.3.00. The cost of water per liter varies depending on the area and the supplier. However, according to the field data, 'Ajinomoto powder' which is commonly used in Sri Lanka to enhance food taste, is used as a water treatment substance and delivered to households. The villagers simply name these bowlers as "Ajinomoto water bowlers". This has become a usual occurrence in the villages and the absence of other alternatives to meet the drinking water needs have led the community to purchase water for drinking.

On the other hand, Reverse Osmosis plants (RO), which have become a popular water treatment system in the dry zone are installed in Chronic Kidney Disease of Unknown etiology (CKDu) prevalence areas where drinking water quality is low. One liter is sold at a rate of Rs.1.00 in many areas therefore a family of four members, approximately spend Rs. 45.00 per day. Some were used to obtain water from the tube – wells despite low water quality for washing and cleaning purposes while some purchase from affluent neighbors in the village. There is another set of communities that trap rainwater during rainy seasons to use in prolonged dry spells.

However, the findings revealed that the communities who are using RO water are unaware of the fact that RO water does more harm than untreated water as it removes 92-99% of required minerals needed to the human body in the process of purification. The World Health Organization points out that RO water brings a "definite adverse influence on the animals and human organism"(World Health Organization,1980 cited in Kozisek,2004). However, since these communities are heavily used to RO– treated water taste, they refuse to consume water that is provided with the national guidelines and required SLS water standard.

Water has become a commodity as some gain and some lose even though access to water is a basic human right. The findings further revealed that access to safely managed drinking water tends to determine by social status. The victims of the water crisis are mostly, economically disadvantaged and socially marginalized communities. Access to water has become a symbol of social class and a subtle water conflict between rich and poor is evident even at the grass-root level due to the ignorance of the rich in addressing water issues. The field data show, easy access to drinking water has gained by the rich than poor even in rural areas and this has led to create a social division and controversial relationship among the community. The losing the social recognition within the community and losing the income by water sellers have become the underlying causes behind the ignorance and it is evident that the social division is initially created at grassroots levels in the village context in which further develops in the multilayered system within the economic and political process further making more favors to the rich marginalizing the poor.

Furthermore, in situations where community-based rural water supply projects are introduced to the village levels, there are instances that public opposition and influences laying barriers in implementation making objections and sabotaging the solutions given for access to water for all. The rejection of proposed water projects is usually a result of biased opinions, existing belief systems in groundwater, losing personal gains, and cultural barriers in which the majority need was overlooked to secure the interests of a few. According to the respondents' views, there is a conflict of interest and controversial relationship among the community in terms of establishing water projects in some villages. The political economy of the village has become powerful enough to determine the implementation or the rejection of the community water projects even after initiation of the project which brings positive impact for the community.

On the other hand, controlling water bodies and determining the distribution of water networks depend on the ranking of social groups or social stratification on the basis of caste,

religion, and ethnicity. Society is unable to get rid of stratification or the ranking of social groups on the basis of notions of high and low, the wealthy and the poor, the powerful and the weak, high status and low status. In some Sri Lankan rural villages, the significance of the caste system has deeply rooted where discrimination and limiting access to resources are justified by the social system making the economically and socially disadvantaged social groups humiliate in public, violating their rights. Even during the empowering community sessions, workshops, and programmes, the cast separation is vivid as the communities in the subordinate caste tend to exclude and demarcate from forbidding them from getting involved with the dominant caste. The findings also revealed that the deliberate destruction of water sources to sabotage the water project has caused the delay or withdrawal of the schemes from the project areas even after utilizing provisions for the initial ground water investigations.

Moreover, the geographical location of the water sources and water availability lead to determine the access to water as dominant castes tend to resist the consumption of water available in the areas where subordinate caste live. On the other hand, the dominant caste makes access restrictions to water sources located in their geographical locations. The situation is similar among different ethnic groups as there are instances where one ethnic group resists water distribution to another ethnic group. These situations have caused subtle clashes among different minority groups.

Environmental justice and racism

In third-generation of human rights, it is considered that people have a right to a healthy environment, a right to natural resources, intergenerational equity, and sustainability (Domaradzki et al.,2019). However, these rights are partially met in developing countries as capitalists decide the needs and wants of people such as water allocation, water availability, quality of water, and other natural resources. Water allocations, management designing policies are controlled and managed by the higher authorities in the political arena. The ownership of natural resources is mainly handled by the rich. They can either decide to preserve the resources or destroy them. The water rights as Shiva says have eroded at present. Free-flowing water has become a profit-generating mechanism, and water wars that have been predicted by Shiva are already taking place in the world(Shiva, 2002).

On the other hand, developing countries are not resource-poor, nevertheless, they have intentionally become resource-poor due to the exploitation of abundant natural resources for unplanned, unsustainable economic development(Jha&Whalley,2001). Inadequate availability of natural water resources has led developing countries to suffer from water scarcity and limited access to water resources. Water scares countries can engage in virtual water trade by simply relying on water-rich countries in food production. The product can export and import among water scare countries as a solution for the water deficit. All water consumed in the production process is calculated to accumulate water in water-scarce countries. When rich countries have options and solutions for water issues, poor countries with high population density become helpless to adapt to water stress situations. However, this is impossible to implement in developing countries as the distribution of water from water-rich areas to water-scares areas within the national boundaries is unlikely due to additional costs and fewer infrastructure facilities.

The findings revealed a segment of a population especially low-income and socially backward population is left out for them to consume contaminated water and allowing them to reside in risky fragile areas. Due to negligence in natural resource management, and the drawbacks in policies, law enforcement, and cultural recognition, surplus and deficits are mis-determined in urban and rural areas. Besides that most of the developed countries overexploit

natural resources to accelerate their economic developments. This affects the low-income countries in long run affecting air, environment, and water as the pollutions across the national boundaries. Same as the inequality between the center and peripheral countries, inequality of distribution of natural resources can be observed in the marginalized vulnerable populations and economically sound social classes. Therefore, these ecological injustices have been politicized based on the vulnerability of communities. Ignorance in providing lasting solutions for these issues which can be easily resolved is common to be observed in the Sri Lankan context.

Environmental justice movements were first initiated in the 1980s in a response to the dumping of toxic chemicals in marginalized residential areas in North Carolina and later “environmental justice” was theorized and defined by the US Environmental Protection Agency as “no group of people should bear a disproportionate share of the negative environmental consequences resulting from industrial, governmental and commercial operations or policies” and calls for “fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies” (Johnson,2006).

In the connection of water and environmental justice, access to safe water or environmental resources has inherently connected with inequalities based on poverty, race, gender locations, and political power. Pollution, race, and poverty are always linked with unequal distribution of social and environmental costs among different social strata(Bullard, 1993). When considering environmental justice for communities, Environmental racism is one kind of environmental injustice that can be simply defined as the marginalization of a racial-ethnic group based on environmental hazards (Pillow & Vazin,2019) and it is not the result of explicitly discriminatory policies of the countries. Since the term environmental racism was first introduced in 1982, ample research has established that low-income communities of color are much more likely to be exposed to environmental hazards and the health effects as a result than affluent or white communities (Jeffrey, 2008cf Jantz, 2017).

Minority Issues

Estate Tamils also, known as up-country Tamils, are immigrant laborers recruited from South India during the British colonial period in the 19th century. They are more likely to live in environmentally hazardous conditions due to racial oppression and diminished economic opportunities. Estate Tamils perceive the damage caused by the ecological system as life-threatening as a result of racial vulnerability. This minimizes their socio-economic and political opportunities which can mobilize them to better socio-economic strata in the society. Nevertheless, the findings revealed that the absence of fair treatment in access to water resources, segmenting them in disaster-prone geographical areas and the poor living conditions have led them to expose to environmental hazards. Limited access to water resources has led minorities to expose to numerous water and sanitation-related issues, experiencing socio-economic and psychological stresses, especially for women during their menstruation period. Discrimination from society and political bodies has also led them to segregate environmentally, socially, politically, and economically. The lack of their organization and political powers also has worsened the situation due to the absence of a platform to voice their rights and frustrations.

On the other hand, since the living space for the minority groups are segmented and the areas they live are prone to landslide, they are marginalized in the social system. Therefore, the tendency to be victimized in environmental hazards is high for minorities than the Sinhalese

majority. On the other hand, the double standard way in which the communities are looked upon made the minorities further marginalized not only from the environmental crisis but from society as well. It explains further in terms of their health, quality of life, and livelihood that they are segregated in society even in natural disasters.

According to the findings of the in-depth interviews and content analysis, it is obvious that the environmental injustice in Sri Lanka is connected with party politics, and access to water resources is politicized within the frame work of power as the water issues are perceived based on political dimension than on social stance. Since these Tamil settlements are in disaster-prone areas, their vulnerability in access to water resources is taken for granted by the politicians. The tendency of the politicians is to make a vulnerable situation a political battleground in order to secure their votes. Rather than providing easy access to water resources and resettling them in a safe geographical area, politicians are reluctant to elevate the social status of these people and un-resolve the issues. In vulnerable situations, politicians are more likely to grab political advantages than providing permanent solutions making the situation a political platform.

Women, water and sanitation in Sri Lanka

In developing countries where the population is continually increasing, freshwater has become a precious and scarce resource. Conflict for Water is a conflict for power. Power hierarchy in control over water resources and water distribution is significant in grass root levels even though fundamental and human rights in the Constitution of Sri Lanka guarantee the right to equality.

However, the findings revealed in the South Asian region, access to water solely depends on power relations and politics. Grass-root environmental action varies based on economic class. Most vulnerable groups perceive the damage caused to the ecological system as life-threatening as the involvement of class-conscious economically sound middle class in collective environmental actions is rare. However, discrimination in access to water is the most degrading and inhuman discrimination which clearly violates basic human rights.

Moreover, according to the field data collected from observations in the dry zone in Sri Lanka, women and girls walk many miles to water points to fetch water. Since the household water needs have become the responsibility of women they travel long distances to water points, sometimes many times a day with a heavy load of water buckets. Her psychological and physical conditions especially during her menstrual period are ignored. Sometimes during droughts, women in shanties in cities stand in the queues near public taps and Wells wasting their productive time which can be utilized in generating an income. Most of the families in the dry zones are daily wage laborers and both men and the woman engage in labor work equally. When women walk miles to fetch water, it becomes an additional burden as it affects family income as a whole. Also, poor access to water impacts sanitation and hygiene, and overall health condition in the family. They use less water compromising their water needs while prioritizing men and the elderly. Also when women and girls walk miles to water points, their security cannot be ensured and they become more vulnerable to abuse and violence. The findings revealed that animal attacks, verbal and sexual abuse are frequent in the social setting therefore women and girls often become prey to wandering men and animals.

Also, despite gender differences, women experience water insecurity more than men. Women are perceived as domestic water suppliers. The presence of unsanitary water due to leaking chemical wastes and other substances affects women as they are the primary providers of household water. However, the discriminatory social structures, attitudes that are deeply rooted in the society create gender inequality, in turn, creating inequalities and oppression in

women's access to water resources (Tennakoon, 2016). As per the eco-feminist perspective, Karen Warren describes the oppression and domination of women in terms of nature. While women are more concerned about nature and its issues, men are concern about culture which consisted of unjust, domination, oppression, and hierarchies. Women and nature are feminine which is morally controlled, exploited, and violated by men. Both include feminine traits, are interwoven, and in the conceptual frameworks. Both are creative, sensitive, give birth, and sustain lives and undergo suppression and mistreatments by the patriarchal, ethnocentric, racist cultures(Warren, 1996)

As Warren (1996) says the findings revealed that women are discriminated against socially, environmentally, politically, and economically in their own social system. Economically disadvantaged communities pay a high price for water than affluent families. One liter of water is sold between Rs 2.00- Rs.3.00 by private water vendors and therefore, a family of 5 members spends approximately Rs 800.00 for drinking and cooking purposes for a month while another spends the same amount for the consumption of 24000 Liters per month. The unequal disparities in access to water solely depend on people's social conditions. Less privileged communities reside in water difficult areas while privileged have easy access to water.

On the other hand, the field data revealed that the access to water in environmental disastrous situations in emergency camps by the displaced people results conflicts in water use due to the fact that water needs are not properly met. Quantitative and qualitative issues in water supply and inaccessibility of water, sanitation, and hygiene make women and girls ill at ease. They need convenient access to water to maintain menstrual health and hygiene. However, access to water in the emergency camps becomes a challenge to women due to the limited amount of water availability. Their needs are ignored and responses are overlooked.

On the other hand, the findings revealed that women and children become victims of water pollution. Water pollutions are the result of bribery and informal and formal political relationships by the poor and rich. Gender-based patriarchal decision-making has become prominent in water pollutions in rives and canals as most of the decisions are taken in favor of the rich through political negotiations and bribery (Mahees et al.,2009). Many canals and rivers are polluted due to the discharge of factory waste, grey and black from septic tanks, and illegal constructions. There are limited control and monitoring mechanism by the responsible government institutions to limit the water pollution as politics are involved in every aspect.

On the other hand, the findings revealed, Urban poor or low-income communities experience uncertainties as they live in illegally constructed informal urban settlements which have been indirectly approved by politicians in the area. Limited availability of water, water-borne diseases, high child and infant mortality rates are common characteristics of these informal settlements. There is a considerable number of low-income settlements in the Kotte Municipal council in which are concentrated in Rajagiriya. Discharging wastewater including grey and black from septic tanks to canals has made it highly polluted with unpleasant odors in Delkanda and Wetland park in Nugegoda. It is found that water is highly contaminated with fecal matter and the situation worsens during heavy rains when the cities get flooded with polluted water. As a result women and children become victims of health issues including water-borne diseases. They bathe and drink polluted water. In the patriarchal system, the consequences of water pollution had to face by women and children.

The social system is dominated by men and they decide the form and reforms of the water world while controlling and shaping the access of natural resources based on caste, class, gender by reinforcing water insecurities among marginalized communities. Voices of women in water issues are ignored in the existing social context. Unequal power relations have made

them excluded in water governance. Their water needs and domestic workloads and insecurities are least concerned in every aspect of the decision-making process.

Women emphasized the need for sanitation facilities as they lack the appropriate waste disposal system. Some latrines are absent of water connections and seem to be in poor condition and some even do not have latrine facilities. Some share a latrine with a pocket of houses while others practice open defecation. These shared latrines lack proper water facilities even though it is shared by many. They tend to practice open defecation which in turn affects their health by wide-spreading many diseases and illnesses. Since they do not have any choice they live in the same environment, consuming contaminated water exposing themselves to various health issues.

Women and menstruating girls seem to encounter issues as a result of difficulties in access to water in which leads to health issues as their intimate hygiene and bodily cleanliness depend on the availability of water. Inadequate washing, washing clothes without soap or unclean water, and reuse unwashed undergarments are common practices among females in lower social-economic groups in rural areas. The absence of latrine facilities in their households increases their hygiene issues and transmission of infectious diseases which may also lead to wider economic and social impact.

The findings also revealed during the menstruation period, girls go absent as many rural schools in Sri Lanka lack adequate water supply and private latrine facilities. This condition is more severe in mixed-gender schools as girls have to walk as the latrines are located outside or in a corner of the school premises. These girls find difficulties in managing their menstrual hygiene in safety and dignity as they expose to humiliation from male students. There are some occasions that teachers request the students to fetch water from nearby houses for them to use latrines. It has become a duty of students to fetch water for school staff and it is discrimination in which school children are treated less favorably and use them to fulfill their personal needs.

Social stratification

On the other hand, the findings revealed groundwater is vulnerable to fecal contamination due to leaks in septic tanks and latrines in highly urbanized areas. The situation becomes worse when the low land areas get flooded extensively. Also, since some areas are lying in the wet zone of the country; and during heavy rains, the groundwater table usually increases. Therefore, this can affect the community that uses boreholes and wells for their daily water consumption as underground water tables can be polluted when wastewater seeps from soakage pits and absorb it to the ground. In-depth interviews revealed that women, especially in low-income settlements have poor knowledge of sanitation and hygiene practices and water-born diseases. They are in a constant battle to survive in an inequality social system where access to clean water has become a status symbol.

According to the findings, water contamination and river water pollution in major rivers in Kalani, Mahaweli, and Kalu rivers have led to cause maximize of water source pollution. Kelani is one of the major drinking water sources in the Colombo District where water is treated and distributed by the State Organization. However, Solid wastewater, oil leakages, domestic sewage, garbage, and agriculture runoff directly discharges from factories, houses, and hotels the wastewater is discharged without being treated causing the river waters to contaminate. Women who live close by using the river water for their domestic daily work such as washing and bathing in a belief that water is clean.

However, it is mandatory for the factories and hotels which discharge wastewater to rivers to treat water before the discharge. There are 4000 illegal constructions in the Kelani river banks in which most of the waste is discharged into the river although it is the main source for

drinking water in the Colombo District. Even though it is regulated by the Environmental protection Authority the water quality in the River is highly contaminated and deteriorated (Abeysinghe&Samarakoon,2017).

The infinite planet, production exploits, and destructs nature by creating environmental catastrophes. Sri Lanka experiences the greatest threats and risks in polluting groundwater. The case of Rathupaswala and Thunnana drew attention to waste removal of the factories and groundwater contamination. This brought out the voice of the grassroots people against groundwater destruction. Today, many nations and local communities are engaged in serious conflicts regarding water. Though Groundwater is the most secure source of water it has started to pollute causing a severe impact on water quality with the concentration of deadly substances like lead, cadmium, vanadium, and arsenic which badly impact humans (Wijewardhana et al., 2016).

In agricultural areas which are most prone to kidney diseases are contaminated with excessive levels of nitrate(Rajapakshe et al.,2016). Therefore, people in these areas buy water for their drinking purpose and use water in domestic wells and lakes and reservoirs for other domestic purposes. It could be observed that the application of pesticides specially Aginomoto, to kill weeds has become a famous application among dry zone farmers. Also, the discharge water in Ro plants in rural villages directly releases to soil and surface water bodies which usually runoff to nearby lakes and rivers and concentrate in the water bodies. Hence it contaminates groundwater, soil, and surface water.

On the other hand, the Salinization of groundwater in the coastal areas is a widespread problem in Sri Lanka. 'Kalu' is a major river that receives high rainfall throughout the year(Ampitiyawatta & Guo,2009). According to the findings, the coastal area of the river shows high salinity since Sea waters mix with river waters at the river mouth polluting pure water which can be used by the community. Seawater intrusion is blocked by laying sandbags every year for a period of time in the vicinity of the river mouth and these bags are often washed in various circumstances and replacing the bags has become a habit every year. This has become a continuous practice to accumulate profit from sandbags. Constructing a salinity barrier as a long-term solution is yet to be implemented. This destroys the availability of safe drinking water to the community causing them to purchase water during such time. The area is at risk as a result of many socio-economic and environmental issues that are hard to comprehend at present. The area experiences water scarcity despite good rainfall while experiencing both floods and droughts. Effective and sustainable use of water services does not seem to be feasible to the community due to financial difficulties and insufficient availability of water intakes.

These disparities in access to water resources are constructed by people who hold power. Since the elite in the political arena least experiences the devastating consequences, the State intervention to address the issues seems to be limited.

Conclusion

The existence of human being solely depends on access to water and is a basic human right which cannot be obstructed by any living being. It is not a private property of the State or Market where it is sold for private interests, accumulation profit by exploiting the water resources by establishing water market, trading freely even across national boundaries. Right to water is given to living beings by the Law of nature where ownerships are dispersed. However, as a result of Capitalism water resources have been shifted from common property to private ownership by prizing water as per the demand. Sri Lanka is gradually experiencing water shortages despite being a water-rich country and the situation has become worse in rural areas in dry zone where low-income communities are highly victimized due to insufficient freshwater

resources. Injustice within the country and between the countries in regard to environmental impacts in the water sector is a result of the deliberate destructive behavior of a few. Inequalities in access to water, mis-management of water resources, poor development strategies, and insensitivity towards natural resources have led the country into uncertainty to meet the future demands of water.

On the other hand access, ownership, and control in water resources are linked up with power and politics, as sharing these resources has led to create social problems. Hence, treating human beings with dignity and respect, irrespective of gender, ethnicity, religion, class, and caste in access to water which is a right of every existing living being is poorly recognized in every stratum of society. While the oppressed fight for water rights, polluters, on the other hand, fight for the right to pollute. However, in the end, the pollution burden is bared by the oppressed regardless of the severity of the pollution while the State ensures the rights of the polluters.

The ecological rights or democracy based on the water will be a serious social crisis in the future due to the limited sources and discrimination in supply. It will create many social movements and political protests especially in developing countries like Sri Lanka. Therefore, the states and civil society organizations must pay special attention to social justice in access to water.

References

- [1] Abeysinghe, N.M.DE.A.,&Samarakoon, M.B. (2017). Analysis of Variation of Water Quality in Kelani River, Sri Lanka. *International Journal of Environment Agriculture and Biotechnology* 2(6), doi: 10.22161/ijeab/2.6.1
- [2] Ampitiyawatta,A.D& Guo, S. (2009). Precipitation trends in the Kalu ganga basin in Sri Lanka, *The Journal of Agricultural Science*, 4 (1). 10-18
- [3] Bohier,R.L. (1934). *Ancient Irrigation Works in CeylonVolume 1, Ceylon:Ceylon Government Press*
- [4] Bullard ,R.D. (1993). Race and Environmental Justice in the United States *Yale Journal of International Law*. 18 (319). Available at: <https://digitalcommons.law.yale.edu/yjil/vol18/iss1/12>
- [5] Domaradzki, S.,Khvostova, M.,&Pupovac, D. (2019). Karel Vasak's Generations of Rights and the Contemporary Human Rights Discourse,*Human Rights Review*20, 423–443doi: 10.1007/s12142-019-00565-x
- [6] Global facility for disaster reduction and recovery. (2017). *Sri Lanka Rapid Post Disaster Needs Assessment Floods and Landslides*. <https://www.gfdr.org/en/publication/sri-lanka-rapid-post-disaster-needs-assessment-floods-and-landslides-may-2017>
- [7] Jantz, E. (2017).Environmental racism with a faint green glow, *Natural resources journal*,58(2), doi <https://digitalrepository.unm.edu/nrj/vol58/iss2/12>
- [8] Jha, R ., & Whalley, J. (2001). The environmental regime in developing countries, in C. Carrsro&G.E. Metcalf (Eds.), *Behavioral and distribution effects of environmental policy*, (pp.217-242). University of Chicago Press.
- [9] Johnson, B. L .(2006). *Environmental Policy and Public Health*, London, CRC press
- [10] Kozisek ,F.(2004). *Nutrients in Drinking water; Health Risk from Drinking De-mineralized Water*, WHO Guidelines for drinking-water quality. WHO Press
- [11] Mahees, M.T.M.,Sivayoganathan., &C.,Basnayaka,B.F.A.(2009).Water Pollution in PingaOya, Mahaweli River : Water Resources Research in Sri Lanka. In Dayawansa,N.D.K., Pthmarajah., &Mowjood, M.I.M (ed.), *Symposium proceedings of Water Professionals' Day* (pp.127-138).GISSL.

- [12] Makwana,N.(2019). Disaster and its impact on mental health: A narrative review, journal of Family Medicine and Primary Care: doi: 10.4103/jfmprc.jfmprc_893_19
- [13] Ministry of City Planning and Water Supply. (2018). *Annual performance report. Performance*. Available at: <https://www.parliament.lk/uploads/documents/paperspresented/performance-report-ministry-of-city-planning-water-supply-2018.pdf>
- [14] Ministry of Environment. (2010). Vulnerability profile: Climate Change Secretariat Water. The national climate change adaptation strategy for Sri Lanka. http://www.climatechange.lk/adaptation/Files/Water_SVP_Nov-16-2010.pdf
- [15] Muller, P., &Hettige, S.T.(1995). *The Burring of Vision- The Mahaweli, Its Social, Economic and Political Implication*, Ratmalana, Sarvodaya publishers
- [16] Pellow, D., &Vazin,J. (2019). The intersection of race, immigration status, and environmental justice, ,sustainability, 11(14), doi: <https://doi.org/10.3390/su11143942>
- [17] Rajapakse,S., Shivanthan, M.C., &Selvarajah,M. (2016).Chronic kidney disease of unknown etiology in Sri Lanka. *Int J Occup Environ Health*,22(3), 259–264.doi: 10.1080/10773525.2016.1203097
- [18] Shiva,V.(2002).*Water Wars: Privatization, Pollution and Profit*. London: Pluto Press
- [19] Tennakoon, S.D.R.(2016 March 18). *The eco-feminist perspective of women access to water resources*. In 2nd Research and development study symposium-2016 , Colombo, Sri Lanka.
- [20] Turrall,H.,Burke,J.,&Faures,J-M.(2011). *Climate change, water and food security*. (Report no. 36) .Retrieved from <http://www.fao.org/3/a-i2096e.pdf>
- [21] UNESCO Sri Lanka, Ministry of Agriculture and Irrigation and Mahaweli Development. (2006). Case study :Sri Lanka national water development report <https://unesdoc.unesco.org/ark:/48223/pf0000147683>
- [22] United Nations.(2009).*World Water Development Report* .Retrieved from https://www.unwater.org/publication_categories/world-water-development-report/
- [23] Warren,K.J. (1996). *Ecological feminist philosophy: An overview of the issues*, USA: Indiana University Press.
- [24] Wijayawardhana,D., Herath, V., &Weerasinghe,A. (2016). Heavy Metal Pollution in Sri Lanka with Special Reference to Agriculture: A Review of Current Research Evidences. *Rajaranta University Journal*, 4(1),52-66
- [25] Wittfogel, K.A.(1957). *Oriental despotism. A comparative study of total power*. 1981 edition ;New York: Vintage Books.
- [26] WithanachchiS,S., Köpke S., Withanachchi C.R., Pathiranage R., &Ploeger A. (2014). Water Resource Management in Dry Zonal Paddy Cultivation in Mahaweli River Basin, Sri Lanka: An Analysis of Spatial and Temporal Climate Change Impacts and Traditional Knowledge. *Climate*. 2(4):329-354.
- [27] World Bank Group.(2020). Climate Risk Country Profile Sri Lanka. Retrieved from <https://www.adb.org/sites/default/files/publication/653586/climate-risk-country-profile-sri-lanka.pdf>