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RESEARCH ARTICLE

WATER CRISIS, SANITATION PRACTICES AND WOMEN'S MENSTRUAL HEALTH

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Abstract

Water, air and light are the three essentials for survival and sustenance of human life. The lack of any one of these makes life difficult. Of these, air and light remain available whereas the water crisis is deepening everywhere. Given the water scarcity in the low income settings, the women are the worst sufferer, for they are expected to manage water even if they have to walk miles to fetch water. Among several consequences the water crisis negatively affects sanitation and hygiene in the immediate setting, adversely affecting living environment. At the personal level, the women and girls are unable to practice sanitary hygiene thus leading to morbidity and disease burden. The poor women due to their low ability to afford scientifically designed hygienic sanitary napkins are compelled to use and re-use old clothes. The water scarcity makes it difficult for them wash and rewash the used clothes. Such unhygienic practices endanger women health. In the backdrop of which this paper deals with the inter-linkages between women and water at the domestic and personal level, as well and analyses the effects of these inter-linkages on women health.

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Introduction:-

The deepening water crisis, increasing atmospheric pollution, smog (smoke mixed with fog) and volatile organic compounds (released by gasoline, paints and cleaning chemicals) affect sun light, which adversely affect human existence. Given the water scarcity in the low income settings, the women are the worst sufferers. May it be their personal hygiene and health, household sanitation or existence at societal level, the consequences are far reaching. The problem begins with extremely high expectations from women to manage water even if they have to walk miles to fetch water. Although water fetched by them is used for the entire household chores and by men folks also, the onus of providing water is on women. In the backdrop of the problems being confronted by women, this paper examines how increasing water crisis effect women, household and neighbourhood sanitation and personal hygiene and menstrual health. The paper uses secondary sources reflecting on the problem and also refer to primary data from empirical study conducted in Shimla, a hill city and only class I city in Himachal Pradesh. The latter is based on personal interviews with 1092 heads of households or their respective representative, constituting 10 per cent of the total households spread over randomly selected 12 of the 25 wards of a city, the only class I city, and capital of a hill state, first of British India Government and after independence of Himachal Pradesh.

Emerging Water Crisis, Sanitation and Women Health

The water crisis, sanitation and women menstrual health issues are not confined to local communities but are part of global scenario and concerns. These have compelled global community, United Nations, a highest level international political forum, which on September 25, 2015 adopted Agenda 2030 for Sustainable Development. At the onset, the

Preamble to 17 goals, primarily, meant a plan of action for people, planet and prosperity of all. It envisaged strengthening universal peace, eradication of poverty in all forms, a greatest challenge and indispensable requirement for sustainable development. The historic declaration enjoined upon all the countries to be the stakeholders and act in partnership in the implementation of the plan of action to achieve 169 targets laid out in the 17 goals. The agenda pledged to carry along all the nation-states so that no country and people are left behind (UN 2015).

In pursuance of the global SDGs, the Government of India adopted the agenda and formulated a comprehensive plan of action India Sustainable Development Goals. It incorporated a large number of schemes with the objective to end poverty in all forms. The schemes listed as Mapping of Central Sector Schemes under different ministries in 2018 (NITI 2018) also constituted strategies and programmes. The schemes to eradicate poverty through different schemes laid emphasis on guaranteed employment and assured livelihood, skill development, pension, employment generation programmes and so on. The first priority was amelioration of extreme poverty among the people living on less than US \$1.25 a day. The targets laid down included bringing down the proportion of men, women and children of all ages living in poverty, covering vulnerable and the poor, ensuring them equal rights to economic resources, access to services, ownership and control over land and other forms of property, ending hunger etc. (NITI 2018: 1-6). It is important to submit here that each of the seventeen SDGs 2030 agenda directly or indirectly as a matter of policy addressed women's issues, who like other disadvantaged and deprived sections of the society have been considered under-privileged and vulnerable.

However, it is an irony that human society comprising 49.6 per cent of women (UN 2019) and the society goes on through procreation involving both men and women, the latter remains deprived and under-privileged. The reason is 'globally gender inequality has been one of the oldest and most pervasive forms of inequality with onus of household burden (managing and raising family) largely on women. Because of their confinement their educational, occupational and economic mobility have been slow and tardy. They, world over, remain 'low paid, unpaid, undervalued and their voices denied, unequal to men and more likely than men to live in poverty. This position of women is substantiated by the fact that globally they are paid 24 per cent less than men; and 75 per cent of women in developing regions work in the informal sector. There are approximately 600 million working in the most insecure and precarious conditions' (OXFAM 2023). The role of women though of great significance yet for long did not get recognition and even now continues a story of neglect and deprivation.

The Global Gender Gap Report 2022 substantiates this fact, specifically with reference to their situation in India. The report states that across 146 countries, though considerable progress has been made yet no country has attained full gender parity. The health and survival gender gap has closed by 95.8 per cent, educational attainment by 94.4 per cent, economic participation and opportunity by 60.3 per cent and political empowerment only 22 per cent (World Economic Forum 2022). The report further states that in the backdrop of the slow and evolutionary speed of progress towards gender equality it would take almost 155 years more to narrow down the gender gap. Hence a question in the global as well as Indian context arises is it possible to meet the target laid down in the SDGs 2030. India, which stands at 135th place in the list of 146 countries, has a score of 0.490 in the Gender Inequality Index. Although the latest Economic Survey (2023) states India making remarkable progress in closing down the gender inequality gap in comparison to other South Asian countries average value of 0.508 and world average of 0.465, yet it remains at rank 122 in the list of 190 countries.

A recent survey report released on Multiple Indicators, January 2020 to August 2021 period, conducted by National Sample Survey Organization (NSSO) though appreciates progress made yet points out a lot of space remains to be covered. In reference to hygiene and sanitation 97 per cent of the sampled respondents in the rural and urban areas have indicated access to improved toilets (latrines). But the term 'improved' implies that respondents already had access to latrines which were of inferior quality and now they are using improved quality. There are 78 per cent rural and 97 per cent urban dwellers who stated access to improved toilets. With regard to access to water 77 per cent rural and 93 per cent urban have on-site hand washing facilities. But piped water availability though also improved is available only to 25 per cent rural and 75 per cent urban households. The cooking medium for millions of women even today after all the big claims remains firewood in the rural areas. The excessive use of coal and firewood exposes them to harmful effects of smoke and pollution. The use of LPG, a clean medium of cooking is available to less than 50 per cent rural households and 92 per cent urban. This is a fact recognized in the report that the basic amenities are keys to hygiene and sanitation but lack of the same for millions of women poses threat to their life, especially in the rural areas.

Given the fact there is water scarcity, particularly in the low income settings, the women are the worst sufferer as they are expected to manage water on their own. It is argued,

“For women, the water crisis is personal. They are responsible for finding a resource their families need to survive- for drinking, cooking, sanitation and hygiene. ...In their efforts to get water for their families, they often face an impossible choice- certain death without water or possible death due to illness from dirty water..... Today, women around the world spend a collective 200 million hours a day collecting water. In addition to time spent in collecting water, millions may also spend significant amounts of time finding a place to go. Thus making up an additional 266 million hours of time each day lost, because they (women) have no toilet at home” (water.org 2023).

Among several consequences caused by water crisis, lack of access to safe toilets, and hygienic and sanitized settings, the women face sexual violence (see Gonsalves et al. 2016), spend long hours of labour in collecting water, consequently are left with no time for education, economic activities (Graham 2016), and face death, disease and sanitation crisis globally (WaterAid 2013). It is just not in the case of women in Sub-Saharan African countries or parts of South Africa where the referred to studies were conducted, rather water crisis caused issues concerning women and their lives frequently occur in the under-developed and the developing countries.

The lack of basic amenities has adverse consequences at the societal as well as individual women and her household level. Such deficits create a vicious circle of insanitation and unhygienic living environment. The conditions being counter-productive not only perpetuate insanitation and unhygienic conditions, illness and create other health issues but also reproduce ongoing inequality between men and women and act as a symptom of discrimination against women (WaterAid 2023: 28). This is a common place observation that poor and the marginal women suffer more due to existing amenity deficits, especially water scarcity and gender disparities impacting their education, health and workforce participation. It is observed,

“2.5 billion population lack access to a toilet and this global sanitation crisis disproportionately affects women and girls. They need the privacy of a toilet during menstruation; they are at increased risk of violence if they don't have to go outside. Ultimately, a lack of sanitation affects female empowerment and women's health,” (ibid.).

The lack of water availability for drinking as well as for other day-to-day necessities is surely to lead to even food crisis, hunger, malnutrition, disease and deaths. The recent draught conditioned water crisis in Somalia has indicated, as per United Nation published study (UN 2023) that 58 per cent of people from 31 countries are suffering from fresh water shortages. The study found that water shortage has increased from 49 per cent in 2014 to 61 per cent in 2022.

Empirical Scenario in the Mountains

It is an irony that Himalayas, a perennial source of water to the people of plains is now gripped with water crisis (Koshy 2020; Shrestha & Nepal 2022). Koshy (2020) citing from a journal (Water Policy) mentioned that eight towns in the Himalayan region of Bangladesh, Nepal, India and Pakistan were nearly 20 to 70 per cent deficient in their water supply. Paradoxically, the consumption of bottled water which is directly extracted from ground water is increasing whereas availability of fresh water supply is crippling. Paradoxically, drinking water and water as such is part of the Sustainable Development Goals Agenda, the predominantly market profit oriented expansion of bottled water industry is counter-productive and works against achieving the target (UN 2023). Some scholars argue that water scarcity is not the problem, rather the crisis are created by the pro-rich water management and distributive system devised by municipal corporation and the idea of optimum use of water, which in fact is not (DTEstaff, 2023). Notwithstanding the claims and counter claims, the fact remains water crisis do exist and affect a substantial percentage of population, especially those belonging to low socio-economic classes, particularly low and lower middle class women. It is due to the objective of setting right the system that the plan of international action on SDGs 2030 has been adopted by the Government of India in totality. A perusal of SDG 3 to 6, namely good health and well-being (SDG 3), quality education (SDG 4), gender equality (SDG 5), clean water and sanitation (SDG 6) and affordable and clean energy (SDG 7) all revolve around women as they are the one who use water more for the activities assigned to them and scarcity of water affect their lives most.

Women and Domestic/Household Sanitation

This is an accepted reality that inadequate water supply affects household sanitation in more than one way. An average household has 4.4 members as per the statement of global data (2021). A field survey (Shaban & Sharma 2007), though more than one and a half decade before indicated that a household in Delhi requires 377.7 liter, Mumbai 406.8 liter, Kolkatta 443.2 liter, Kanpur 410.9 liter, Ahmedabad 410.9 liter and Madurai 363.1 liter per day. Accordingly in each of the major cities per person per day water requirement is 78.0 liter, 90.4 liter, 115.6 liter, 96.2 liter, 77.1 liter, 95.0 liter, and 88.2 liter respectively. Despite the claims by the residents of these cities that have adequate water supply but the fact is that this satisfaction is based on their adjustment with whatever water they receive per day. Shaban and Sharma (2007) noted that in all cities the consumption as per indication of availability of water shows water per capita is much lower than what is recommended by the Bureau of Indian Standard and the tenth Five Year Plan. The recent information and data released by Ministry of Jal Shakti (2020) is depressing as the per capita availability of water in the country is reducing. It is stated that in the year 2001 the per capita availability was assessed at 1816 cubic meter which reduced to 1545 cubic meter in 2011. It is further expected to reduce to 1486 cubic meter and 1367 cubic meter in the year 2021 and 2031 respectively.

The data from the survey carried out by the author of this paper (Sharma & Bhandari 2019) in a mountain city revealed that on an average the minimum per day water requirement of a household comprising 4 to 5 members is approximately 300 liter, which may vary depending upon area of the house. A two bed room house with kitchen, two wash rooms (cum-toilets) occupied by 4 persons requires minimum 25 liter water for cleaning of floors, 200 to 300 liter for bathing, flush and washing. Majority of the households get approximately 200 liter per day, sometimes on alternate days. The exceptions are houses occupied by the elites, including businessmen, politicians, bureaucrats, journalists and others who get supply round the clock. The argument made above that there is enough water but the problem is of management and fair distribution also holds true to a considerable extent in the case of a mountain city which is also tourist place as well as capital of a state. The tourist in-flow during summers and then from mid-September to end of October, the floating population increases and water is diverted to hotel industry. The use of corrupt practices by the officials and hoteliers also increase. The local population suffers as the supply of water is considerably affected. Over the years the population of the city has also increased and the demand for housing shooting up. The expansion of settlements and increased construction activities further jeopardize water supplies. The non-expansion of the water supply system, seepage, old and broken pipelines, and lack of funds multiply the problems for women. The reason being initially water reservoir was built only for 25,000 to 50,000 people. At present the population of the city has already touched 2,32,000. The number of households has also multiplied over the last few decades, but the water reservoir has not expanded to cater to the growing water needs of increasing population and members of their respective household.

This is not uncommon to observe that wherever the water supply is inadequate sanitation of the entire house, especially kitchen, toilet(s), rooms and even of the open spaces is affected by the compounding un-cleanliness. This is more so in the case of most houses and buildings in the mountains due to damp conditions, lack of light blocked by haphazard growth of habitats and excessive use of fossil fuels for cooking and heating. The emission of stink cannot be ruled out. Under the given conditions, women are the ones prone to suffer more due to inappropriate water supply and sanitation (Wendland et al. 2012). The unhygienic toilets (public) as well the house threaten the health of women and girls who are more likely to attract infections of reproductive or urinary track (Phillips-Howard et al. 2011). A quote below indicates the drudgeries of water scarcity created crisis in the Himalayan regions,

“Women from across the Hiamalyas are speaking out against discriminatory gender-roles that place them at the centre of the region’s selling water crisis. But is anyone listening?” (Qadri & Qadri 2022).

The problem does not seem to have any solution in the near future, claims the above analysis (ibid.). The authors further argue that the problem is going to increase further due to melting and losing ice cap to the extent of one-third of its volume by the end of century. This may be mentioned here that millions of people living in mountain regions, namely Ladakh, Jammu and Kashmir, Himachal Pradesh and Utrakhand are being affected due to melting glaciers in Western Himalayas. This is the reason that United Nations (2014) while reviewing SDGs 2015, expanded its scope by including hygiene, water and sanitation concerns in the SDGs 2030.

Women, Water, Personal Hygiene and Sanitation Practices

Gender disparities all over the globe and in India constitute one of the most critical issues though women number almost half of the population. The disparities exist in education, health, and employment which not only hinder life chances available to women and girls but also leave them dejected. In some societies the governments world over

have realized the fact that in the management of water inadequacies the involvement of men and women is significant in sustainability in sanitation. Since in India, women are responsible for household chores among which fetching water is the priority. But during winters and rainy season it is extremely difficult to fetch water. The burden on women also creates physical and mental problems for them (Qadri & Qadri 2020). Even during the field work it was found that almost 90 per cent of women state that water shortages force them not to wash clothes for days as these don't dry up easily, the house remains unclean too. They get infections, cold and cough and physically unwell soon. The women in pregnancy and in the menstrual cycle suffer most from insanitation.

The discomfort during menstruation is conditioned by water inadequacies and socio-cultural conditions governing women's life in India in general and mountain regions in particular. There are approximately 355 million women and girls in India experiencing menstruation related indignity in the management of menstrual hygiene (Kiawah Trust & USAID 2014). Indignities and embarrassment is caused by lack of knowledge prior to onset of menarche, shock of the fears and unusual feelings, and lack of counseling and management. The prevalent economic inequalities and patriarchal influences, the women also experience deprivation in meeting their personal needs, like buying scientifically designed sanitary napkins. The inability of women belonging to lower socio-economic strata of society to afford safe and hygienic methods (using safe sanitary napkins) on one hand and lack of support from state on the other make their menstrual experience and management difficult for women. Although women in the mountain regions are very hard working, engaged in agricultural and horticultural productive activities yet they are subjected to discrimination, and suffer from a sense of inferiority in relation to men.

The lack of sanitation facilities, specifically toilets for an estimated 63 million adolescent girls living in homes (ibid.) confronts them with the issue of privacy, a formidable challenge. The lack of access to high quality menstrual management products, as is observed that 88 per cent women and girls in India use homemade alternatives, namely old cloth, rags, hay, sand or ash (ibid.). In Himachal Pradesh, it is encouraging to find 94 per cent households having access to toilet facility, with urban areas having more (98 per cent) than the rural (93 per cent). In all other districts of the state the access ranges from 86 per cent (Kangra) to 98 per cent (Mandi). Only in three districts, namely Bilaspur, Mandi and Shimla 100 per cent households have access to toilet facility (NFHS-5 2021: 4). Given the high access to toilet facility, hygienic practices among girls of 15 to 24 years, the findings suggest that 86 per cent use sanitary napkins, 31 per cent use cloth, and 7 per cent use locally prepared sanitary napkins during their menstrual periods. A total of 92 per cent of the women use hygienic methods of menstrual management in Himachal Pradesh. There has been improvement in this highly important area of women hygiene as compared to 84 per cent found during NFHS-4 (ibid.: 29).

However, in the use of methods of menstrual protection and management there are variations conditioned by age, residence, levels of schooling, religion, and caste (Table 1, Annexure- 1). While age-wise differences are not minimal, residence wise variations are considerable. It is found that more rural women (32.5 per cent) make use of cloth in comparison to urban (20.0 per cent). The use of sanitary napkins is almost the same but data also indicate that percentage of hygienic method user is relatively higher in the urban area, suggesting less accessibility and affordability of hygienic methods in the rural areas. The years of completed schooling indicate that those with no schooling represent the highest among cloth users whereas with the increase in the level of completed schooling the percentage of cloth users declines considerable. It suggests education is an important condition in menstrual management. This is substantiated by the fact that with increase in the number of years completed in the school, the percentage of sanitary napkin users also increases. The religious-wise data indicate variations. While the maximum cloth users come from Muslim background, the percentage of such women is lower in other religious denominations, least among Sikhs, followed by other and Hindus. The highest percentage of sanitary napkin users is found among women belonging to Sikh community followed by Other, Hindus and Muslims. The caste-wise findings indicate that the number of cloth users during menstruation is highest among the Scheduled Castes women, followed by Scheduled Tribe, OBCs and Other. But variation is relatively high and low. The variations in the sanitary napkin users' category is also minimal, ranging between 84 per cent (SCs) to 89.8 per cent (OBC).

Along with the social characteristics, economic status is important in the determination of use of a method in the menstruation management. This is argued that usage of hygienic methods among women belonging to richest wealth index is almost eight times higher than women belonging to poorest category (Kathuria et al. 2018). In addition, cultural taboos create difficulties for adolescent girls in seeking help and guidance (Chothe et al. 2014). The meanings, beliefs and myths attached to menstruation, such as unclean, ritualistically and religious impure, restrictions and prohibitions, ignorance and inhibitions among parents all affect women's knowledge and attitude to

address various issues concerning women's physical and mental health. A report Menstrual Health in India brought out by Kiawah Trust sponsored by Bill and Melinda Gates Foundation (2016) points out menstruation health has not been prioritized. Most aspects of menstrual hygiene remain unexplored. The report indicates need for prioritizing menstrual health of women and girls for a healthy society.

Concluding Observations:-

Menstrual Hygiene and Improving Women Health

The issue under consideration cannot reach conclusions on the basis of brief discussion on some of the aspects of relationship between water, sanitation practices and women's menstrual health. Whatever one may say about the improvement taking place, which is a fact also, but there is lot to be accomplished. Even today, globally there are millions who face denial of a dignified and healthy way of management during the menstrual cycle. The girls and women with disabilities face even greater challenges in managing menstrual periods (UNICEF 2019). The non-availability of required facilities and lack of knowledge result in poor hygiene which is a cause of reproductive track's infections and reproductive health related problems. The disabilities are not merely physical or mental. These include poverty, inequalities and inequities, lack of awareness and knowledge of menstrual management, education and economic deprivations. Moreover, the society needs to be educated so that the myths associated with menstruation, fears of stigma, and other such disabilities are dispelled.

Annexure I

Table 1:- Methods of Menstrual Protection and Management by Background Characteristics (Ever menstruated women aged 15 to 24 years).

Background characteristics	Method of Protection/Management								
	Cloth	Local	Sanitary napkins	Tampons	Menst. cup	Other	Nothing	%age hygienic method	Number of women
Age									
15-19	30.0	6.6	87.7	0.0	0.2	0.0	0.0	92.7	1,389
20-24	31.9	7.0	84.4	0.2	0.2	0.1	0.1	90.5	1,392
Residence									
Urban	20.0	9.5	86.8	0.7	0.0	0.3	0.0	96.3	343
Rural	32.5	6.4	85.9	0.0	0.2	0.0	0.0	90.9	1,438
Schooling									
No Schooling	89.0	5.3	53.6	0.0	0.0	0.0	0.0	58.9	24
5-7 years	58.4	6.6	78.6	0.9	0.0	1.4	0.0	84.4	65
8-9 years	45.6	10.0	75.9	0.0	0.0	0.0	0.2	85.1	319
10-11 years	28.9	4.7	90.2	0.0	0.0	0.0	0.0	97.2	52
12 plus more	26.7	7.1	87.3	0.1	0.3	0.0	0.0	93.1	1672
Religion									
Hindu	30.7	6.9	86.0	0.1	0.2	0.1	0.0	91.5	2,654
Muslim	49.7	7.7	81.5	0.0	0.0	0.0	0.0	88.0	60
Sikh	21.9	3.1	94.1	2.9	0.0	0.0	0.0	97.2	52
Other	27.0	6.4	93.5	0.3	0.6	0.0	0.0	99.4	16
Caste/Tribe									
Sch. Castes	39.7	6.4	84.0	0.1	0.4	0.1	0.1	89.6	757
Sch. tribe	31.4	6.4	86.9	0.0	0.6	0.0	0.0	92.5	141
OBC	30.3	2.6	89.8	0.0	0.0	0.0	0.0	91.9	466
Other	26.3	8.5	85.8	0.2	0.1	0.0	0.0	92.5	1,407
Total	30.9	6.8	86.1	0.1	0.2	0.0	0.0	91.6	2,781

Source: NFHS-5, p. 167

- Note: 1. Total includes women with less than 5 years of schooling and women who don't know their caste/tribe shown separately;
 2. Due to multiple responses percentage may increase 100 per cent.
 3. Locally prepared napkins, sanitary napkins, tampons, and menstrual cup are considered to be hygienic methods of protection.

References:-

1. Chothe, V; J. Khubchandani, D. Seabert et al., 2014, "Students' Perceptions and Doubts about Menstruation in Developing Countries: A Case Study from India," *Health Promotion Practices*, Vol. 15, pp. 319-26.
2. DTE Staff, 2023, "World Water Day 2023: India can sow the World How Water Management can be Reinvented, says CSE," *Down to Earth*, Wednesday March 22, downtoearth.org.in/news/water/world-water-day-2023 (Accessed on 23.03.2023).
3. FSG, 2016, *Menstrual Health in India: Landscape Analysis*, India, www.fsg.org
4. Global Data, 2022, "Average Size of Households in India (2010 – 2021)," <https://www.globaldata.com> (Accessed on 23.03.2023).
5. Gonsalves, G S.; E H Kaplan & A D Paltiel, 2015, "Reducing Sexual Violence by Increasing the Supply of Toilets in Khayelitsha, South Africa: A Mathematical Model," *PLoS ONE*, Vol. 11, No. 6, e0155981, (Accessed on 18.03.2023)
6. Graham J P.; M. Hirai & S S Kim, 2016, "An Analysis of Water collection Labour among Women and Children in 24 Sub-Saharan African countries," *PLoS ONE*, Vol. 11, No. 6, e0155981 (Accessed on 19.03.2023)
7. IIPS & ICF, 2021, *National Family Health Survey (NFHS- 5)*, India, 2019-21, Himachal Pradesh, Mumbai: IIPS
8. Kathuria, Bhawna & Sherin Raj T P, 2018, "Effects of Socio-Economic Conditions on Usage of Hygienic Method of Menstrual Protection among Young Women in EAG States of India," *Amity Journal of Healthcare Management*, Vol. 3, No. 1, pp. 40–52.
9. Kiawah Trust, 2015, *Owning Her Future: Empowering Adolescent Girls in India*, Dasra, India: Kiawah Trust.
10. Kishor, Sunita & Kamala Gupta, 2009 (August), *Gender Equality and Women's Empowerment in India*, Mumbai: GOI, MOH&FW and IIPS.
11. Koshy, Jacob, 2020, "Water Crisis Looms large in Himalayan Regions," *The Hindu*, March 02, New Delhi
12. OXFAM, 2023, "Why the Majority of the World's Poor are Women," *OXFAM International*, <https://www.oxfam.org/en/why-majority-worlds-poor-are-women>
13. Phillips-Howard, P A; L/ mason, J. Hopkins, R. Rheingans, K. Alexander & K Laserson, 2011, "Water and Sanitation Issues in Relation to Sexual and reproductive Health Across the Female Lifespan, Background White paper," *Liverpool John Moores University, United Kingdom*.
14. Population Census, 2023, "Shimla Urban Population 2011-2023," www.census2011.co.in/census/metropolitan/4-shimla.html, (Accessed on 24.03.2023).
15. Press Information Bureau, 2020, "Per Capita Availability of Water," <https://pib.gov.in/PressReleasePage.aspx?PRID=1604871> (Accessed on 23.03.2023).
16. Qadri, Haziq & Inzamam Qadri, 2022, "Our Life is Wasted: On Melting Glaciers and Gender Roles," *Women's Rights*, November 21, <https://www.fairplanet.org/story/our-life-is-wasted-on-melting-glaciers-and-gender-roles/> (Accessed on 25.03.2023)
17. Shaban, Abdul & R N Sharma, 2007, "Water Consumption Patterns in Domestic Households in Major Cities," *Economic and Political Weekly*, Vol. 42, No. 23, January 9,
18. Shrestha, Arun Bhakta & Santosh Nepal, "The Himalayan Waters: Complex Challenges and Regional Solutions," *Down to Earth*, Monday, November 30, <https://csestore.cse.org.in> (Accessed on 21.03.2023)
19. Singha, Anand, 2023, *Economic Survey 2023- India has made Significant Progress in Gender Equality*, <https://www.cnbctv18.com/india/economic-survey-2023-india-has-made-significant-progress-in-gender-equality-15809351.htm> (Accessed on 18.03.2023)
20. *Tribune*, 2023, "Progress Report- Gains made, but Hygiene Indicators far from Ideal," (Editorial), March 18, Chandigarh: *The Tribune*, p. 10.
21. UNICEF, 2019, *Guidance Note: menstrual Health and Hygiene for Girls and Women with Disabilities*, <https://www.unicef.org/media/98881/file/MHH-Disabilities-Guidance-Note-ENG.pdf> (Accessed on 27.03.2023)
22. Uniliver Domestos, WaterAid & WSSCC, 2013, *We can't wait: A Report on Sanitation and Hygiene for Women and Girls*, <https://washmatters.wateraid.org/uk/sites/g/files> (Accessed on 19.03.2023)

23. United Nations, 2019, World Population Prospects, Geneva: Department of Economic and Social Affairs, Population Division.
24. Wendland, C.; M. yadav, A. Stock & J. Seager, 2017, "Gender, Women and Sanitation," in J. B. Rose & B. Jimenez-Cisneros (eds.) Water and Sanitation for the 21st Century Health and Microbiological Aspects of Excreta and Wastewater Management (Global Water Pathogen Project), (J. B. Rose & B. Jimenez-Cisneros (eds.), Part 1: The Health Hazards of Excreta: Teory and Control), Michigan State University, E. Lansing MI: UNESCO (Accessed on 23.03.2023)
25. Zumbish, 2023, "Run-up to UN Water Conference: A Third of People Surveyed by Global Study suffer from Freshwater Shortage," Down to Earth. Wednesday, March 15, <https://www.downtoearth.org.in/news/-88241> (Accessed on 23.03.2023).