Chapter 16
Importance of Women's Indigenous Knowledge of Water Conservation and Management in Sri Lanka

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Abstract Indigenous knowledge held by women are different from men due to their daily roles, interests, and experiences. Despite their perspective, knowledge help by women is seldom integrated into the decision-making process. In the present study, elderly village women from Sri Lanka are enquired about the value of water to them, the local practices for use, storage and conservation, and the loss of indigenous knowledge. The findings of the study demonstrate the importance of water as perceived by these women when they relate water to life. The elderly respondents identify several local water use and conservation practices including recycling the wastewater to water the plants and for cleaning up soot from used pans and pots. However, the elderly village women unanimously stated that indigenous and local water knowledge and practices are declining rapidly since households get piped water supply and people do not have any more motivation and need to save water compared to previous times. Hence, the local practices that were adopted to save water are no more practiced leading to loss of knowledge. The study demonstrates the gap in integration of indigenous knowledge while planning for piped water supply to households. In case of any future disruption in supply, the local people will be in despair as they do not hold the indigenous knowledge anymore. The current study highlights the importance of integrating indigenous water knowledge held by village women into the decision-making process for future water sustainability.

Keywords Water knowledge · Gendered approach · Indigenous knowledge · Local water practices · Water reuse · Sri Lanka

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16.1 Introduction

As of 2021, an age where technology has advanced and a number of countries are highly developed, billions of people still lack access to clean water, which is a very basic need for every human being (Felter and Robinson, 2021). More than 2 billion people live in countries that experience water stress, which is when 25% or more of a country's renewable freshwater resources is being withdrawn (UN-Water, 2021). Consequently, as population continues to grow with water being used and managed in the scenario of business-as-usual, communities facing water stress will continue to grow along with the increase in water scarcity. Water scarcity can be due to water shortage or inability of people to access water, and it is seen to increase all around the world at double the growth of population (UN-Water, 2021). Such shortages can also have a cascade of impacts on ecosystems, biodiversity, agriculture, and food. This can also lead to tensions among regions and countries as they compete for a valuable resource as the scarcity is not evenly distributed around the world. The most impacted by this would be the world's poor who are already facing many other challenges. As such, sustainable use and management and conservation of water are of utmost importance to ensure that freshwater continues to be a renewable resource available for healthy ecosystems and healthy communities.

Traditional practices of water management from indigenous people around the world have developed from their interactions with the natural world and not having access to modern technology. Many countries have still not fully integrated indigenous knowledge in policy planning and decision-making when considering water management and conservation. In countries like Australia, even though effort is being made to be inclusive, there are clashes between western solutions and indigenous knowledge as different aspects of the environment, processes of nature and using natural resources related to water are viewed in different ways (Ayre and Mackenzie, 2013). However, in many other countries, the importance of indigenous knowledge is not studied in depth. A lot of effort needs to be put into gathering indigenous knowledge before its lost and then to preserve it so that it can be used in current and future problems that arise in managing water sustainably (Nianthi and Dharmasena, 2009).

During the International Conference on Water and Environment in January 1992, one of the main outcomes was the agreement that women play a major role in water provision and management but that they hardly take part in water governance, and this has not improved much since (Khayat, 2021). The importance of recognizing the role of women in water management and including them in governance of it can be highlighted from the case in Malawi from the 1980s when the government of Malawi introduced a piped water distribution system to low-income communities as explained by Trivedi (2018) of the World Resources Institute. A committee consisting of 90% men was created to manage community-run taps and collect payments; however, since it was mostly women who stayed home and used the water and the men were mostly not home, the committee did not fulfil its duties. Once a high proportion of women were included in the committee and trained, the

payments were done with regular meetings, and access to water increased with redesign of taps, leading the project to success. According to the report by UN Women (Prasad, 2018), in household without direct access to water, 80% of the time, women and girls bear the responsibility of collecting water. This role means that women are more likely to have more knowledge on how these systems work and what the requirement are for an efficient water system that will be taken up by a majority of people. This type of role in collecting water also means that women will have less of a change to pursue a career and girls are hindered in their education process which in turn affects their career path. A study in Ghana found that while women did realize they have a crucial role to play in water governance, they face hindrances in participating due to social and cultural norms in a male-dominated community where men play a bigger role in public (Svahn, 2011). Similarly, data from many other projects around the world show that including women in the decision-making process regarding water will only push the project to be better and successful in achieving its goals (Women for Water Partnership, 2016). Women's knowledge in water management has accumulated for years from them being cast in the roles of collecting and managing water, and they are very specific to local conditions, which is a common feature of indigenous knowledge. Therefore, women's input in water governance is very important as they are better able to recognize issues that are overlooked, leading to better outcomes.

In the past, Sri Lankan women played a specific role in managing water for household needs including livestock watering. This indigenous knowledge of Sri Lankan women is sparsely studied, and women are seldom included in the decision-making process. It has been identified that there is a major lack of data regarding water issues and gender (Athukorala, 2002). Women farmers also still continue to undertake a variety of techniques in farming practices, including irrigation, derived from the indigenous knowledge that has been passed down, and they are well aware of these benefits as per a recent study (Hettiarachchi, 2022). Furthermore, in recent times, women's participation in rural water schemes, which can be seen as business models, has led to women taking up some leadership roles in these schemes but not necessarily as entrepreneurs as there are a number of challenges they face including lack of formal education, family commitments, lack of empowerment, etc. (Donald Sinclair, 2020). Thus, this chapter aims to explore and understand the knowledge currently retained by some indigenous women in Aranayake, in the Sabaragamuwa Province of Sri Lanka, to determine the importance of consolidating such knowledge of indigenous women to better manage and conserve water.

16.2 Research Methodology

16.2.1 Study Area

Sri Lanka has a number of administrative division levels where provinces (the first major division) are divided into districts (administered by a district secretariat). Each

district is further divided into 5–25 "divisional secretariat" divisions (DS divisions) and broken down into even smaller administrative units called "Grama Niladari" divisions (GN division) which are a collection of few villages. The area selected for this study was Aranayake, a DS division within the district of Kegalle in the Sabaragamuwa Province of Sri Lanka (Fig. 16.1) and which covers an extent of 122.8 km^2. The Kegalle district has an area of 1694.5 km^2 (Survey Department 2022) where, according to the Department of Census and Statistics (DCS), approximately 47% is cultivated, while 0.96% is taken up by large inland waters, 9% makes up forested areas, and 33.6% consists of home gardens (DCS 2021). High rainfall can generally be observed for most of the year from April to December with peaks in May and October (DCS, 2021).

The Aranayake DS division's main sources of income include cultivation of tea, cloves, and pepper. There is also some paddy cultivation. The major stream of Sabaragamuwa Province, known as Maha Oya, originates in Aranayake and flows out into the Indian Ocean from the west of Sri Lanka. The main sources of water for people living in Aranayake include natural springs, Maha Oya, and piped water from the National Water Supply and Drainage Board (NWSDB). Some people use pumps to pipe water from natural springs to their homes; however, a majority have access to piped water from the NWSDB.

16.2.2 Data Collection

In line with analyzing indigenous women's knowledge on water use in Sri Lanka, the sample was restricted to women over the age of 60. Ten women were interviewed from two GN divisions in Aranayake DS division, namely, Randiligama (four) and Yodhagama (six), as indicated in Fig. 16.1, which cover an extent of 4.73 km^2. Half of the women interviewed were over the age of 80. A structured interview was conducted for qualitative analysis. The questionnaire focused on everyday sources of water for use in the household. The questions aimed to understand the significance of water to women and how its importance and the way water is used have changed over time. The questionnaire also aimed to determine how water availability has changed over time. Specific questions to understand folktales regarding water and local and traditional practices of water use and conservation were also included. Overall, the same eight questions were asked from each person. For some of the women, the question(s) needed to be asked/clarified multiple times due to their problems with hearing or them requiring clarity on the question. The interviews were conducted in Sinhalese and recorded with verbal permission from each interviewee. The answers where then converted to English for analysis.

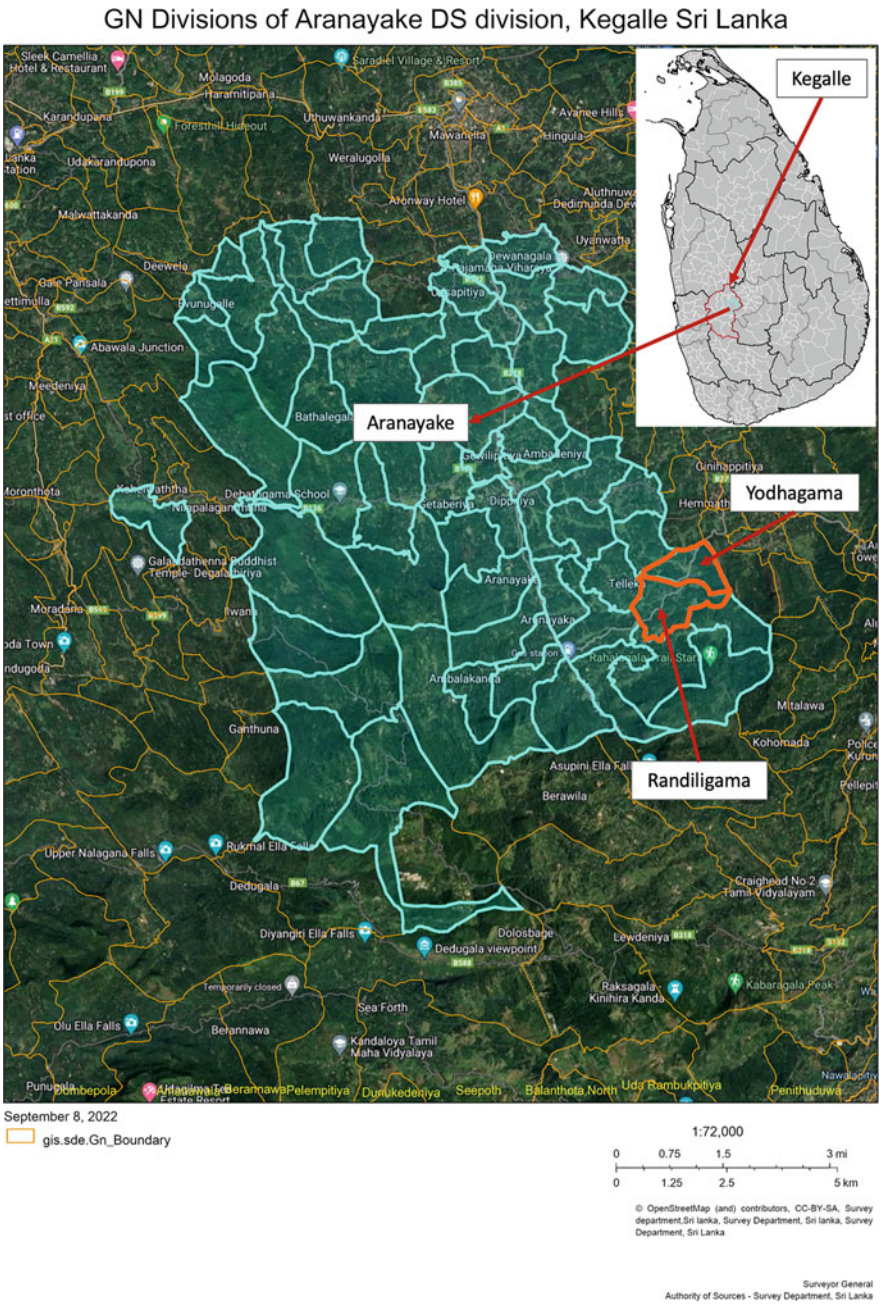

Fig. 16.1 Map of Sri Lanka and location of Aranayake and study area. (Source: Survey Department (2022))

16.3 Results and Discussion

Gender plays an important role in mediating the interaction between human and environment. It often influences the use, knowledge, management, access, and control over environmental resources (Sunderland et al. 2014). Women and men held different knowledge, perceptions, and preferences for environmental conservation, and these may influence which conservation and development options are most appropriate for a given site (e.g., Rao et al., 2003). Women, being the provider as well as highest user of water in household, decide the use, the treatment, as well as the conservation of water for domestic purpose. Due to the different tasks that women perform at the household and community level and the amount of time they spend in their immediate environment, it helps them to acquire knowledge on a range of matters related to the management of water (Mcleod et al., 2018). Women possess significant knowledge on availability of water and practices to use water wisely to minimize losses. Women have a lot of experiences in conserving resources for family as well as community consumption and have a comprehensive understanding of their local surroundings (Shonsey and Gierke, 2013; Carvajal-Escobar et al., 2008).

In the present study, data collected through interviews are analyzed qualitatively using thematic analysis.

16.3.1 "What Is Water to You?"

To explore how elderly women from the study area value water, the first question asked to them is "what is water to you?". The received answer, as expected, was unanimously "Water is life." All the respondents agreed that water is the most essential natural resource required for sustenance and that there is no alternative to it. Water, being the most important natural resource, has always been highly valued, and for women who take care of the daily household chores, water is an integral part of their lives. Understanding the significance of water is the first step toward its mindful use and conservation.

McGregor (2001) reiterated that "water is life" and is considered "a living entity." Several articles also stated that water is life, water is sacred, and water is alive with a spirit (Chief et al., 2016; Cave and McKay 2016; McGregor, 2012). This difference or similarity in understanding what water is is the basis of how different peoples manage, understand, and exist with water.

16.3.2 Changes in Water Values and Availability.

When asked if the value of water has degraded over the years, the elderly respondents unanimously agreed. As now water is available at every household through piped connections, the availability has significantly improved, and women no longer must suffer from the hardships of collecting water from a distance. But, as two respondents pointed out, piped water is sometimes muddy, especially in monsoon season, and not suitable for use. Earlier, when the women used to collect water from wells, they used to never get muddy water. One respondent (age – 65 years) said:

> *We never collected muddy water from the wells. If water in the well started looking muddy or off colour, we used to remove all the water and let the new clean water from the spring collect in the well again. Since we went to the well to collect water, we could also see any issues with our agricultural fields (paddy and vegetables) like water levels and that way we used to be able to protect them as well. But now we can't see such issues since we do not go to the wells often.*

The respondents agree that though the availability has been significantly high, the water values have decreased. With increased land clearing and pollution, water is losing its natural properties, and it becomes difficult to consider them as holy. The contaminated water is not used for drinking or any other purpose; thus, the value of water as a pure resource declines.

16.3.3 Local Water Practices for Use and Conservation.

In rural developing countries, women and girls are recognized as primary stakeholders in household daily activities, including fetching water, cleaning, cooking, washing, and sanitation, as opposed to men (Garcetti and Kevany, 2013). In the current study, the elderly respondents stated different practices that are used for water storage, use, and conservation at the household scale. The use of these local practices primarily depends on the socioeconomic conditions of the household. An elderly respondent (age – 82 years) from Alagalla village stated:

> *We would bring water from the well and filter it into a kettle and boil the water before drinking. Also, the water used to wash rice is reused to wash cooking pots and pans to remove soot. Since we cook on woodfire there was a lot of soot collected on the pots and pans. Since we must walk far to collect water, we try to save water by reusing it.*

Boiling water is a well-known practice for consumption purpose in households with no other water filtering equipment. The reuse of water left after washing rice in removing soot is an indigenous practice adopted by local households. Another respondent (age – 81 years) from the same village responded:

> *When washing dirty pots and pans, dishes, and cups/mug, we follow a certain process. First, we pour clean water into a basin, then we wash the dirty items. After the washing is done, the dirty water is used to water vegetable patches, plants, and trees instead of throwing it out. Then we rinse everything again with some more clean water, and the water from the second*

wash is usually used for brick making when required for any construction around our house. We also use water that has been used to wash rice to wash pots and pans and water plants to save water. We filter water using cloth.

The reuse of water is a common practice by women to save water. As women must collect water from a distance, they are more mindful about the conservation of water. Women are not only adopters of water conservation practices but are also responsible for educating children and supervising family members in performing these practices (Weng and Nitivattananon, 2007).

Another elderly respondent (age – 74 years) from Medhiliya village mentioned about a local technique for collecting rainwater. She stated:

Rainwater is collected into basins by tying branches from Areca nut tree, where the leaves are plaited together, so that water can be directed from the tree to the basin. This water was used for purposes other than drinking.

Though these local practices are not highly specific to the study area, and various rural areas across developing and less developed countries practice similar techniques, the examples cited here help to understand how women value water and adopt practices for its judicial use.

16.3.4 Loss of Indigenous and Local Knowledge

The global discourses about indigenous knowledge and practices of water emphasize on them being lost. Globally, the indigenous cultures are losing at an even faster rate than the loss of species. In the present study, irrespective of the villages, all the respondents agreed to the fact that indigenous and local knowledge are losing rapidly. The respondents explained that piped water supply has made water easily available and that too in sufficient quantity. Hence, the local people do not need to collect water anymore, store them, or filter them. This has led to loss of motivation and conservation attitude among people which in turn leads to the loss of indigenous and local practices that were previously carried out to save water. While piped water supply is one of the major achievements from the water quality, quantity, and health point of view, it has its disadvantages leading to the loss of valuable indigenous and local knowledge and practices, as perceived by the local respondents. At a cognitive level, piped water supply led to a disconnection between people and the indigenous and local water knowledge and practices, causing what Pyle (1993) calls "the extinction of the experience."

16.4 Conclusion

This study presents an account of how water is valued and how it has led to the adoption of different water use, storage, and conservation practices among women. Indigenous and local knowledge about water is highly place-based, which is also evident from the current study. The elderly women under study highlighted the various local water practices that have been conducted to meet the household needs. However, the village elderly women unanimously agreed that these knowledge and practices are going downhill rapidly, more so with the laying off piped water supply. The local people have seemed to experience loss of motivation as water is available abundantly and the need to recycle and reuse water is lost. Availability of water has also led to its wastage. The developmental dilemma is very prominent in this case where a needed developmental intervention leads to loss of highly valuable local and indigenous knowledge. With the loss of this knowledge, in case of any future disparity in piped water supply, the local people are supposed to be in immense despair. Integration of the local and indigenous knowledge held by women to technological development and documentation and sharing of this knowledge is imperative for sustainable water supply to the local community.

Gender refers not only to the literal meaning of women or men but also to their status, responsibilities, rights, and participation in all areas and at all levels of social affairs, which include resource management, public authority, and decision-making. The indigenous knowledge and skills retained by women often differ from the knowledge held by men. These differences are particularly reflective of their daily roles, interests, and experiences. However, females are not usually considered as equals to males in participating in water governance because of gender discrimination, lack of knowledge, tradition, and culture limitations. As a result, the views and feelings of females, as well as gender disparity toward use and conservation behaviors, are consistently ignored in public policies. Such neglect results in inefficient water resource management . Therefore, understanding female views, consciousness, and perceptions toward water use behaviors and gender disparity is essential to formulate effective public policies.

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