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Forest Policy Development and Traditional Knowledge-based Practices: A Case Study of Ritigala Forest Reserve in Sri Lanka

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Abstract

The long-term relationship between the forest and the community has created enormous knowledge about how to use forest areas sustainably which is known as Traditional Knowledge (TK). Modern forest conservation methods have failed to accomplish their objectives while considering TK as an outdated process. This paper has examined the conflict zone between forest conservation and traditional knowledge-based practices in Ritigala forest reserve. Semi-structural interviews and field observation have been used for primary data collection and the purposive sampling method was used to choose 25 individuals for interviews. According to the findings, the local people of Ritigala have engaged in traditional livelihoods like traditional medicine, traditional agriculture, and the collection of non-timber forest products. Declaring a part of Ritigala as a strict reserve, carrying out restoration programs and outreach programs, rehabilitating tanks, taking legal actions, establishing community organizations and awareness programs are some conservation efforts. Only 36% of the participants are satisfied with these efforts being made, while the remaining 64% are not. So, the measures taken to improve the livelihoods of the people are creating further distance between the community and the forest. The main effects of ineffective forest policies are turning rural people into illegal users, losing their livelihoods, and rural poverty. Therefore, prohibiting local people to enter the forest areas is not the best solution. Accordingly, an integrated approach could be the most promising solution to address the clash between forest conservation and traditional knowledge while implementing both conservation and local people's requirements by sharing benefits and responsibilities in a sustainable way.

Keywords: Traditional knowledge, Forest conservation, Ritigala, local people, Integrated approach

1. Introduction

A forest is a resource of infinite compassion and generosity, taking nothing from others for its own existence (Karunaratne, 2013). Approximately, the world has about 4.06 billion of total forest cover while tropical region is holding the highest proportion about 45% (FAO, 2020a) These forests produce both timber and non-timber forest products (NTFPs) to

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satisfy local people' requirements (Ramakrishnan et al., 2002). For instance, the NTFPs from tropical forest biodiversity were estimated to be about US$ 117–144 hectare per year for some regions of Peru (Trivedi & Raj, 1992).

It is needless to say that, forests are the base camp of living beings (Trivedi & Raj, 1992). Forest is a part of both the people's beliefs and the religious, social and cultural structure of the people living in the periphery areas (Byron and Arnold, 1997 cited in Blockhus et al., 2002). The relationship of forest and human beings led to the belief that forests are part of human life (Bandara, 2017). This long-term relationship between the forest and the community has created a lot of knowledge about how to use forest areas sustainably and it can be described as Traditional Knowledge (Pei et al., 2009). Generally, this knowledge is a combination of cultural and religious beliefs of local people (Ramakrishnan et al., 2002) and has evolved for thousands of years over generation to generation of the local communities thorough the stories, songs, folklore, and training from elders to the youngers under fluctuations of the environment, economy, and social conditions (Parrotta et al., 2016).

Significantly, traditional knowledge based practices (TKBPs) of locals have contributed to the sustainable use of NTFPs since they understand healthy ways to manage and conserve trees (Pei et al., 2009). For instance, Traditional Ecological Knowledge in Thathe Vondo, South Africa is consisted of traditional activities related to customs, rituals, and myth where local people play rituals related to death ceremony of their chiefs (Sinthumule & Mashau, 2020). These people hold the belief that their late chiefs take on the forms of thunder, lighting birds, and white lions to serve as forest guardians and pursue anyone who entered the forest and violated the law (Sinthumule & Mashau, 2020).

Apart from the growing concern towards the role of traditional knowledge and related practices in sustainable forest management worldwide (Boafo et al., 2015), forest depletion has become a critical issue in the current world with 4.7 million hectares of net loss per year during 2010-2020 and 10 million hectares of deforestation between 2015 and 2020 (UNEP & FAO, 2020). Regarding the Sri Lankan context, the forest cover was about 82% in 1881 and decreased to 17% in 2017 (Wijayawardhana, 2010) even though our country has numerous forest conservation policies such as Forest Ordinance of 1907, Plant Protection Ordinance of 1924, Fauna and Flora Ordinance of 1937, Forest Act No. 56 of 2009, Amended Forest Act No. 13 of 1982, Amended Forest Act No. 84 of 1998, Amended Forest Act No. 65 of 2009, National Environment Policy of 2003, National Environment Act No. 47 of 1980 and National Forest Policy of Sri Lanka 1995 (Bandara, 2017). These policies and

regulations of Sri Lanka have banned local people from entering to the forests. For instance, the Fauna and Flora Ordinance No.02 of 1937 has introduced protected areas within the country and has mentioned rules and regulations related to control and management of facilities within National Reserves like "(a) no person shall be entitled to enter any Strict Natural Reserve or Nature Reserve, or in any way to disturb the fauna and flora therein; (b) no person shall be entitled to enter any National Park except for the purpose of observing the fauna and flora therein; (The Fauna and Flora Ordinance No 02, 1937:2p)."

Nowadays, the forest cover of most countries is preserved through these modern forest conservation methods but those practices have failed to achieve the targets (Asante et al., 2017) while considering TK and practices as an outdated process (Asante et al., 2017). It has been said that, forest-based TK and practices are disappearing day by day due to technical development, inappropriate policies as well as the abandonment of marginal areas (Parrotta & Agnoletti, 2007). Accordingly, it can cause enormous negative effects on local livelihood, well-being, biodiversity of fauna, and flora of ecosystems which they rely on (Parrotta et al., 2016).

Globally, TK have been identified as a basic tool of future management tool (Ramakrishnan et al., 2002). Importantly, it highlights the global pattern of TK and practices becoming more valuable while Sri Lanka has not. (Parrotta et al., 2016). Through current preservations, local communities have become illegal users of the country's forests which they have been relying on for a long time (Wickramasinghe, 1995). That is because current conservation practices have dropped out of the integrated approach between state and local communities (Wickramasinghe, 1995). Balancing these sectors will require a better understanding of policymakers as well as high participation of local communities (Parrotta & Agnoletti, 2007). Therefore, despite using this knowledge as a tool for conservation, a conflict has started between the development of forest policy and TKBPs.

One of the best ways to solve today's forest-related problems is to develop an integrated approach between forest policies, traditional knowledge, and related practices. In a country like Sri Lanka, local communities require much more attention in particular. Because local communities and TK have not been adequately protected, issues with the forest cover are getting worse. Therefore, this study aims to address the conflict zone between TK and forest conservation through an integrated approach which can balance TK, forest policies and local people's needs while identifying TKBPs associated with forest reserves and alteration of livelihoods and TK due to forest policy development.

1.1 Main Objective

- To study the conflict zone between forest conservation and traditional knowledge-based practices.

1.2 Other Objectives

- To identify the traditional knowledge-based practices associated with Ritigala Forests Reserves.
- To study the alteration of livelihood and traditional knowledge-based practices of local people due to forest policy development.
- To develop an integrated approach to create better forest conservation and management.

2. Materials and Methods

2.1 The location of study area

Ritigala Forest Reserve is the designated study area for the study of traditional knowledge-based practices and the development of forest policies. Accordingly, three Grama Niladhari Divisions (GNDs) near to the Ritigala forest reserve belonging to Palugaswewa Divisional Secretariat Division (DSD) have been selected which are Galapitagala, Senadhiriyagama, and Horivila GNDs (Figure 1). The most diversified flora and fauna can be found in the Ritigala Forest Reserve, and nearby communities have relied on its resources for hundreds of years. These people have an inseparable long-term bond with the forest. That long-term coexistence has created a vast body of traditional knowledge about forest use. The Ritigala Reserve was chosen as the study area because it has an environment that is conducive to achieving the study's goals. Additionally, the three chosen GNDs are close to the forest and its resources, which create the perfect setting for this study.

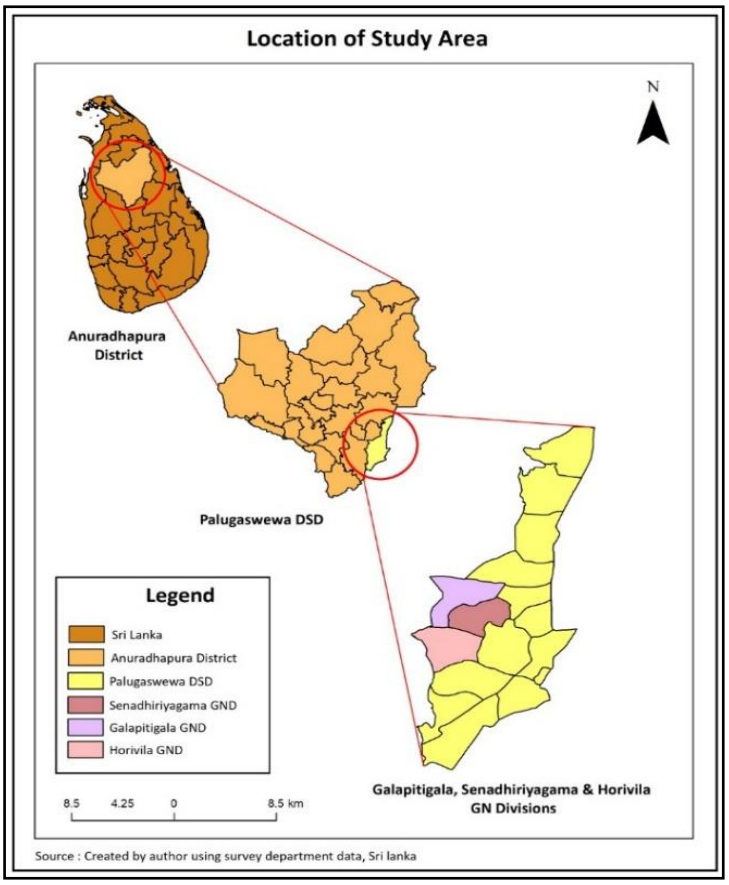

Figure 1: The location of study area.
Source: Created by the Author using Survey Department Data, Sri Lanka

2.2 Method of data collection

As the purpose of this study was to collect data from local residents with specific characteristics on TK and related livelihoods, purposive sampling method was chosen considering its appropriateness. In light of this, 27 participants were selected to represent the Galapitagala, Senadhiriyagama, and Horivila GNDs (Table 1). In order to fulfill the objectives of the study, the primary data was collected through semi-structured interviews with 20 rural residents who have been dependent on the forest and who have extensive knowledge on sustainable forest use, five traditional healers whose knowledge has been passed down through generations in Senadhiriyagama, Horivila, and Galapitagala GNDs and two officers from *Department of Wildlife* Conservation (DWC) and *Department of Forest* Conservation (DFC) who are involved in the Ritigala natural reserve management.

On the contrary, a questionnaire has been used to collect accurate quantitative data on the distribution of TK and livelihoods of the people of Ritigala, their forest utilization patterns, their perspectives on forest policies as well as the impact of those policies on local livelihoods. Here, a questionnaire has been used to collect quantitative data from 20 local people and 5 traditional healers. The field observation during 2022-2023 has been conducted to observe the exact situation in the Ritigala Natural Reserve and Senadhiriyagama, Horivila and Galapitagala GNDs related to research topic.

Table 1: The classification of participants.

Participant types	Number of participants	Dates
Local peoples (20) Galapitagala Horivila Senadhiriyagama	 8 6 6	2022.12.11/ 2022.12.24/ 2022.12.25 2022.12.26 / 2022.12.27 2022.12.30 / 2023.01.01
Traditional healers	5	2022.12.26/ 2022.12.30/ 2023.01.02
DWC officer	1	2023.01.02
DFC officer	1	2023.02.08

Here, the secondary data sources like research papers, reports, books and internet sources have been used in order to get a prior knowledge about concepts and theories related to the study. On the other hands, institutional sources like DWC reports, DFC reports and DSD reports have also been used. The case reports about illegal human activities related to Ritigala Forest Reserve were collected from both DWC and DFC offices along with the consultancy service report on the biodiversity baseline survey: Ritigala strict natural resource from DWC office and resource profile of Palugaswewa from DSD.

2.3 Data analysis

Two analysing methods have been used to analyse collected data related to the development of forest policy and traditional knowledge based on practices. They are,

- Thematic analysis
- Statistical analysis

When it comes to thematic analysis, it was used to analyse qualitative data from semi-structured interviews and field observations like the use of TK on forest utilization, forest conservation and management efforts, and impact of forest policy development on TK and traditional livelihoods. On the contrary, statistical analysis was used to analyse quantitative data from the questionnaire. Most precisely, the data related to the TK-based livelihoods associated with Ritigala, the purpose of NTFPs utilization, the most common NTFPs, utilization of the most common NTFPs, forest conservation and management efforts, and reported illegal human activities were analysed using statistical analysis. In this study, descriptive writing and photographs were used to present the analysed qualitative data. On the contrary, graphs as well as tables have been used to present the analysed quantitative data.

3. Results

3.1 Traditional Knowledge-based livelihoods associated with Ritigala

The people around Ritigala have lived in harmony with the forest since ancient times. A long-term relationship and proximity to the Ritigala Reserve have concentrated enormous traditional knowledge and practices around this area. Traditional medicine, hunting, traditional agriculture, and the use of NTFPs are the main traditional livelihoods in this region (Figure 2A; 2B; 2C). Women are one of the main stakeholders of NTFPs sector as you can see in the figure 2A. Their income directly goes to family caring and children's education. When it comes to collecting firewood, it is basically done by elderly women for domestic purposes as shown in figure 2C. Trading of NTFPs is a seasonal process based on tourism. Most of the local people sell those products by building small tables or huts along the road to Ritigala (Figure 2B). Paddy cultivation is the primary agricultural method used in these regions. On the other hand, traditional medicine medical system of these villages has evolved from generation to generation since the establishment of settlements.

Figure 2: The Livelihoods of local communities in Ritigala.
(Figure 2A: NTFPs traders, 2B: NTFPs trading place, 2C: Forest fiber collector)

The most prominent medicinal plants which were collected from periphery areas and Ritigala Forest Reserve can be identified as Binkohomba (*Muronia pinnata*), Mee (*Madhuca longifolia),* Aralu (*Terminalia chetula*), Bulu (*Terminalia belerica*), Kothala Himbutu (*Salacia reticulato*), Gammalu (*Pterocarpus marsuipium*), Kohombha (*Azadirachta indica*), Ranawara (*Cassia auriculata*), Wellangiriya (*Capparis zeylanica*), Wanaraja (*Anoectochilus setaceus*), Iruraja (*Zeuxina regia*), etc (Table 2).

The collection of non-timber products is a dominant part of the livelihoods of these communities. The collection of Ritigala fruit products is usually a seasonal process. About 79% of NTFP collection requirements are met through peripheral areas and 21% of them are collected directly from forest areas. The most common NTFPs are Bee honey, fruit products like Nelli (*Phyllanthus emblica*), Atabha (*Mangifera zeylanica*), Gal siyabhala (*Dialium ovoidum*), Palu (*Manilkara hexandra*), Veera (*Drypetes sepiaria*) (Table 2), and medicinal plants, forest fibers, and bush meats**.** Among them, the collection of medicinal plants has the highest concentration, followed by honey, bushmeat, fruit products, and forest fiber (Figure 3). Regarding the purpose of use of NTFPs, about 60% of the sample had both trade and consumption purposes, while 16% and 24% of the sample had only consumption and trade purposes respectively.

Table 2: The classification of common NTFPs in Ritigala.

Types of NTFPs	**Local names**	**Scientific names**
Fruit products	Mora	*Dimocarpus longan*
	Palu	*Manilkara hexandra*
	Veera	*Drypetes sepiaria*
	Atabha	*Mangifera zeylanica*
	Nelli	*Phyllanthus emblica*
	Wal Abha	*Mangifera zeylanica*
	Gal siyabhala	*Dialium ovoidum*
	Ma dam	*Syzyguim cumini*
Medicinal plants	Binkohomba	*Muronia pinnata*
	Mee	*Madhuca longifolia*
	Aralu	*Terminalia chetula*
	Bulu	*Terminalia belerica*
	Kothala Himbutu	*Salacia reticulato*
	Gammalu	*Pterocarpus marsuipium*
	Ranawara	*Cassia auriculata*
	Wal nawahandi	*Rhipsalis baccifera*
	Athdemata	*Gmelina arborea*

	Ankenda	*Acronychia pedunculata*
	Wellangiriya	*Capparis zeylanica*
	Gun suriya	*Thespesia populnea*
	Wanaraja	*Anoectochilus setaceus*
	Iruraja	*Zeuxina regia*
	Vishnukranthi	*Evolvulus alsinoides*

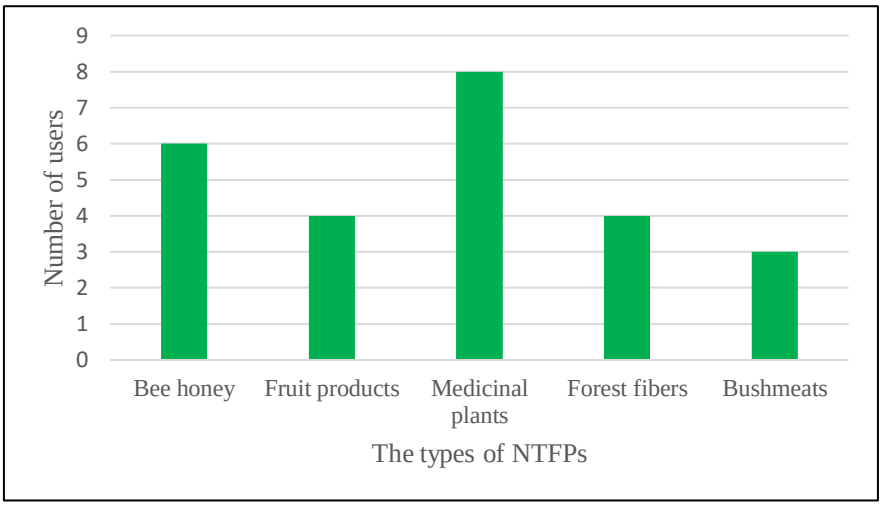

Figure 3: Utilization status of most common NTFPs in Ritigala.

Generally, the local people's relation with the forest is based on their beliefs, norms and cultural values. The findings revealed that they worship God Ayyanayaka before entering to the forest. Further, they used to hang small branch leaves on the tree to find way back home. They strongly stated that those practices have protected them until they came home. Since their lives depend directly and indirectly on the forest, the TK is most common.

3.2 The usage of traditional knowledge on forest utilization

When talking about the usage of TK, Ritigala occupies a prominent place. People in the surrounding areas of Ritigala have utilized the forest and its resources from ancient times along with the traditional knowledge. These

forest-based knowledge has led to use forest products in a sustainable manner. "Half from the village, half from the forest" is a beautiful quote which was started by a villager regarding the utilization of the forest with TK to sustain their livelihood. The findings revealed several environmental friendly practices based on TK while utilizing the forest and its products.

- The fruits like Palu, Veera, Gal siyabhala, Mora are the most dominant fruit products in this area. Collecting these fruit products is a seasonal process. When such fruits are collected from the forest, fruits from the branch tips or fruits that have fallen to the ground are collected rather than cutting down the entire tree.
- The local people have worshiped the large trees like Bo, Na and Mee. They believe that gods live within the trees. Therefore, they did not harm or cut down those species of trees. They used to enlist the help of the spirits even for the cultivation of Chena.
- Usually, most of the plants required for medicine are procured from the forest or periphery areas. Such medicinal plants are also procured following eco-friendly methods based on TK. When collecting medicine, no one will remove the entire trunk; only the necessary portion of the tree is given. For instance, Binkohomba is one of the most utilized medicinal plant in this area. All parts of the plant are needed for traditional medicine, but due to their worth, only the leaves are gathered. When there are several buds in the tree, one bud is always saved. Moreover, traditional healers have specific equipment to collect the forest product which do not cause massive damage to the environment (Figure 4). These tools are really small and built to collect very small parts of medicinal plants without harming the whole plant.

Figure 4: The equipment of traditional medicine.

- When it comes to hunting, people do not hunt pregnant animals and small cubs.
- People always worship God Ayyanayaka before entering the forest. And they used to hang a small branch from a tree.
- Even their houses have built in an eco-friendly manner using hays and clay.
- Collecting bee honey is an important part of their livelihood. It is also based on their TK. According to the villagers, there are several parts of the bee-hive. People only collect "Peni Wadaya" while saving "Nekath Wadaya" with the aim of saving the bee population and future bee harvest because Nakath Wadaya is the kingdom of the Bee queen.

3.3 Forest conservation and management efforts in Ritigala

In the Ritigala region, DWC is in charge of preserving both the local communities and the forest cover. For that purpose, several forest conservation and management efforts have been made in the past years with the participation of local residents. Declaring a part of Ritigala as a strict natural reserve (SNR), carrying out restoration programs and outreach programs like providing animals, plants, and sewing machines to improve the quality of life of the community, and rehabilitating tanks to protect villages from elephant attacks while meeting water and food needs, taking legal action to discourage human activities, establishing community organizations and awareness programs are some of them (Figure 5).

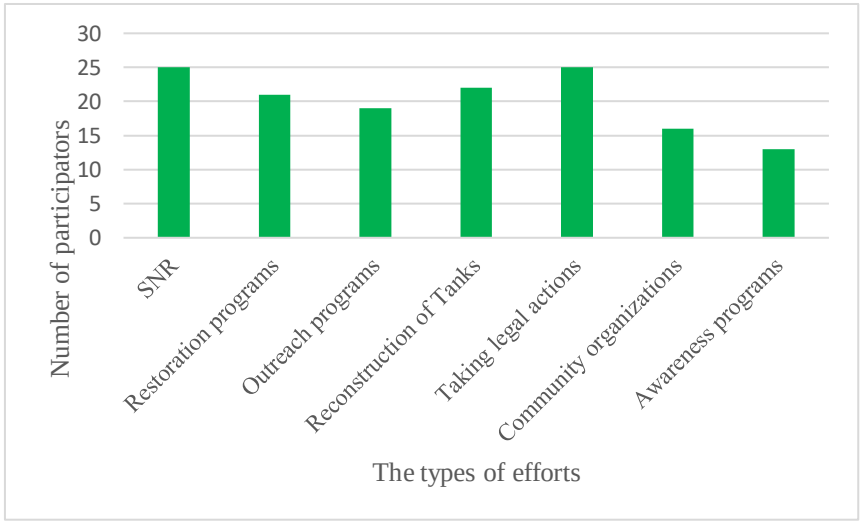

Figure 5: Forest conservation and management efforts in Ritigala.

3.3.1 Declaring Ritigala as a SNR

The area 1528 ha of Ritigala was declared a SNR on 17 November 1941 vide Gazette No. 8809 (Chandananda, 2017). According to the findings, the SNR concept is the effective decision to protect this valuable forest cover from the short-sighted activities of outsiders. On the contrary, this effort has led to a decline in TK and related practices over time. Local villagers are not the responsible parties who cause negative impact on the forest.

3.3.2 Restoration projects

In here, DWC and DFC have also conducted restoration projects along with the community. In 2021, DFC has conducted a restoration program in the karadakawewa state forest by planting Haya trees over 15 ha with the help of local communities (Figure 6)

Figure 6: Rural women working in the restoration site managed by the DFC. (DFC office of Kekirawa, 2022.02.08)

The DWC also has conducted a project by planting Cashew trees. The effectiveness of these projects is questionable according to the villagers.

> *"Restoration projects are not successful. Villagers were asked to join this project. Men went to cut the boundaries. At first, we cut a strip of about six feet in the forest. After that, plants were planted. Those plants did not even grow. They must have used the money for their benefits which they got for those projects (villager, male, 74 years old, Galapitagala, 2022.12.25)."*

3.3.3 Proceeding outreach programs

The livelihood of these people is unstable, because the highest percentage of the total population is engaged in agriculture-based income streams. As a result, they are more susceptible to rural poverty. Their desire to use the forest and its resources, whether legally or illegally, ultimately grows as they suffer. The main objective of the outreach programs implemented by DWC in the villages near Ritigala is to increase their livelihood by providing alternative sources of income through providing plants like aloe vera, tgc mango to the local people, providing sewing machines and livestock animals like hens and dairy cattle, conducting Apiculture training programs, and providing fisheries equipment for the fishermen.

3.3.4 Reconstructing of tanks

There are a number of tanks around the Ritigala including keeriyagaswewa wewa, Aluth wewa, Lidakatu wewa, Atawera wewa, Aliyagale wewa and Ulpatha wewa, etc. These tanks have been reconstructed with several objectives. One is to ensure food and water security for the elephant population. This will indirectly protect the agricultural land of the local people and protect their livelihood. DWC has implemented these projects over the years. In the past, they renovated the Keeriyagaswewa wewa. The results show that this practice has negatively impacted the tank.

> *"Now son, about four years ago, wildlife office reconstructed our village tank. The people who made it did not construct spill in the right place. We were not even welcomed to that project. Consequently, tank was broken on the heavy rainy day. Until today, it has not been rebuilt. We have knowledge to understand where to put spill in order to save water. But they did not listen to what we were saying. That is why it happened (villager, female, 64 years old, Galapitagala, 2022.12.11)."*

This incident reflects the impact of disregarding TK in forest conservation and management processes. Local villagers are very knowledgeable about everything. Ignoring their valuable knowledge has had adverse consequences for the village.

3.3.5 Taking legal actions

The local villagers with sustainable livelihoods have become illegal users due to policies. These policies prohibited people from entering the forest even though it posed no threat. According to the findings, the forest use of these peoples does not consist of massive commercial purposes. They have utilized

the forests sustainably with the aim of protecting the forests for future generations.

According to DFC rules, any person who engages in unauthorized activities in the conservation forest shall be liable to imprisonment for a term not exceeding seven years or to a fine not less than 50000 rupees and not exceeding 150000 rupees or to both. When it comes to the state forest, any person who engages in unauthorized activities in the state forest shall be liable to imprisonment for a term not exceeding five years or to a fine not less than 5000 rupees and not exceeding 50000 rupees or to both.

According to DWC legislations, any person who engages in unauthorized activities in SNR "shall be guilty of an offence and shall on conviction be liable to a fine not less than fifteen thousand rupees and not exceeding fifty thousand rupees or to imprisonment of either description for a term not less than two years and not more than five years or to both such fine and imprisonment (The Fauna and Flora Ordinance No 02, 1937:7p)."

In the past year, the DWC and DFC have received 22 and 5 reports respectively about illegal actions. Among those cases, illegal hunting is the most prominent illegal activity in this area (Figure 7).

Figure 7: The illegal bushmeat caught by the DWC. (DWC office of Ritigala, 2022.01.02)

3.3.6 Establishment of community organizations

These organizations are called disseminative Community Finance Organizations. DWC is the institution in charge of keeping these groups operational. These have been established with the objective of meeting the

financial needs of the community. The Alagollewa disseminative Community Finance Organization, which was founded in 2006 and is still active, is the finest illustration of the community organizations.

3.4 The impacts of forest policy development on TK and traditional livelihoods.

The Ritigala is a unique place nurtured by traditional forest-related knowledge. Even the wind that flows from the Ritigala forest area is adored by the locals who have enormous knowledge of the forests. Traditional Knowledge, based on experience which is passed down over time is an invaluable resource in such a setting where knowledge is an asset to a country. The main foundation of traditional knowledge is its sustainable use. It is correct to say that the respect and love for the plants and animals of the forest is the main factor that influenced the preservation of the Ritigala forest for so long.

Forest policies in Sri Lanka did not include the core concept of forest conservation and management where the population with enormous knowledge on forest utilization is a great asset. In the case of the Ritigala Forest Reserve, the conservation and management efforts to protect TK and traditional livelihoods are less. On the contrary, all participants strongly believed that forest policy development and related regulations had the highest negative impact on their traditional knowledge. This is because most of the conservation policies and efforts related to the Ritigala Forest Reserve have not focused on the value of TK and traditional livelihood practices.

Neglecting traditional knowledge which is one of the best currently available methods for forest conservation, in an environment where numerous international and national organizations as well as various institutions bring different types of efforts and policies on forest conservation, is a major issue. It undoubtedly brings a challenge not only for the present but also for the sustainable use of forests for future generations.

The study revealed several negative impacts on TK and livelihoods which have occurred due to the failure to understand the core idea of the local's requirements and the intimate relationship between local people and forest, the temporal changes of the local's perspective and behaviors, and ineffective forest conservation efforts. They are turning rural people into illegal users. The other negative impacts are the increase in the number of illegal users followed by the decline of TK, the enhancement of rural poverty, alteration of livelihood, indirect death, further destruction of forest and creating conflict between forest conservation and TK.

The Ritigala forest cover is mainly maintained by DWC and DFC. The area belonging to Strict Reserve and the buffer zone is under the protection of DWC and Galapitagala Conservation Forest (2478 ha) and is maintained under the authority of DFC along with Ritigala State Forest. People have turned into illegal users as a consequence of forest policies that do not take their needs into account. During this year, illegal sand mining, illegal NTFPs collection, illegal encroachment and illegal hunting were reported in both DWC and DFC protected areas (Figure 8).

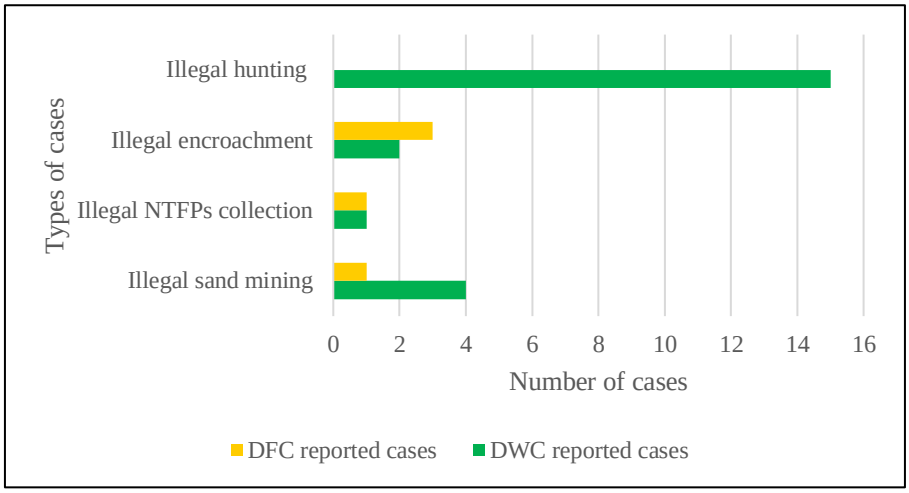

Figure 8: Reported illegal human activities in Ritigala

These forest policies are in constant conflict with the traditional knowledge as well as the related livelihood practices because the needs of the traditional people which must be included in the purpose of forest conservation are not taken into account. Terms such as community participation have deep meanings that are not limited to words. In many policy making processes in Sri Lanka, it can be seen that the deep meanings of these terms are not completely understood and attached (Wickramasighe, 1995). The problem here is that statements are limited to the policies and statements without proceeding effectively.

> *"Policy makers do not know the relationship between forest and people. For the rules to be successful, they must be brought to the right place. Without it, increasing the fines will not be enough (villager, male, 36 years old, Horivila, 2022.12.27)."*

The various impacts of forest policy development in the rural community around Ritigala clearly illustrate the conflict between forest policy and traditional knowledge. Beside the main impacts, the study revealed that there were indirect death accidents due to elephant attacks as well.

> *"We cannot even cut a handle for hoe from the forest. Because of these, we recently lost a good man in the village. He has avoided the main road and took the forest road thinking that he would be caught by the wildlife officers. After that he was killed by an Elephant (villager, female, 38 years old, Galapitagala, 2022.12.11)."*

As revealed in the study, the measures taken to improve the standard of living of the people are creatng further distance between community and the forest. For example, outreach programs prevent people from entering the forest by introducing alternative means of subsistence. Nonetheless, the effectiveness of these efforts are questionable. Accordingly, the reasons for the clash between forest conservation policies and the traditional livelihoods are the failure to recognize the core idea of conservation in the forest policies, neglecting of the traditional knowledge and the livelihood in policy development, rural poverty, and the common concept that humans are the primary force behind forest destruction.

4. Discussion

The urgent need for a sustainable forest management tool is accelerating day by day. However, the modern scientific knowledge is not the only solution to achieve sustainable forest management goals (Sinthumule & Mashau, 2020). While the local responsibility of forest conservation is with local communities, the broader meaning of forest conservation and management relies on both state and local community (Wickramasighe, 1995). The local people have their own roles to play in forest conservation and management process. Those roles can be divided into three main categories.

- Relieving of pressure on the forest.
- Smoothing hostilities between the forest and the non-forest surrounding.
- Deflecting destructive exploitation of forests (Wickramasighe, 1995).

Accordingly, at first, these roles of local people must be fulfilled in the forest conservation and management process in order to flow their roles collaboratively with the state (Wickramasighe, 1995).

In Sri Lanka, government and policymakers have paid their attention to TK and related practices through National Forest Policy 1995, Forestry Sector

Master Plan 1995, National Policy and Strategies on Traditional Knowledge and Practices related to Biodiversity 2020, and other policies. "The traditional rights, cultural values, and religious beliefs of people living within or adjacent to forest areas will be recognized and respected" is one of the objectives in National Forest Policy 1995 (Ministry of Agriculture, Land, and Forestry, 1995).

But at present, the policies and regulations which are introduced and implemented by the government of Sri Lanka have not been able to fulfil these three roles of local communities. The current forest governance of Sri Lanka is based on political influenced mechanisms (Akurugoda & Karunaratne, 2022). They are not eco-friendly and sustainable. Although there are responsible parties in the institutions who are engaging in forest conservation and trying to stop the government-sponsored human encroachment, life threats and upper political influence act as a huge barrier in the present (Akurugoda & Karunaratne, 2022). Such inefficiencies can also be identified in the forest conservation and management process related to Ritigala Forest Reserve. Ignoring both the value of the traditional knowledge of these local people and their capacity for forest conservation have further resulted in the ineffectiveness of the forest conservation process. Moreover, the local cultural and socio-economic aspects should not be neglected in forest conservation (Wickramasighe, 1995).

In such a situation, the potential of creating an integration between traditional knowledge and forest conservation is also rising in the world with the aim of making forest conservation more effective (Parrotta et al., 2016). This need has been highlighted in the Ritigala Forest Reserve in an environment where attention about the integrated approach is at a very low level.

According to Gilmour, "in terms of conservation actions, parts of the logic implicit within the sustainable concept has been to link the conservation of a particular resource with the perceived development needs of the population which is dependent on that resource for livelihood support" (Gilmour, 1994 cited in Wickramasighe, 1995).

But he has presented three arguments by pointing out the difficulties of implementing this concept in the practical world (Wickramasighe, 1995). They are,

- Alternative livelihood approach
- Economic development approach
- Participatory approach

When it comes to the participatory approach, it occurred "where communities are more likely to agree to conservation initiatives if they can be actively involved in planning and management of resource use and if they can share the benefits" (Wickramasighe, 1995). The primary strategy of this integrated method is to preserve the forest while sharing the benefits through the use of TK.

Accordingly, several attempts can be identified globally where traditional knowledge and related livelihoods have been successfully used for forest conservation. Ghana is one of best examples which preserved number of forest reserves by using socio-cultural beliefs of the traditional people (Asante, 2011 cited in Asante et al., 2017).

In the pace of current forest conservation policies, there is a need to implement an integrated approach as a sustainable conservation tool, as the traditional knowledge and related livelihoods around Ritigala are fading away. According to the results of this study, people also have positive opinions about using integrated approach to achieve sustainable forest management.

> *"The government is a place that we have appointed to address our problems. Then they should give priority to what villagers say. If both of them come together, we can go on a great journey while protecting both forest and local people. Then even the younger generation will not ignore what elders say (traditional healer, male, 52 years old, Horivila, 2022.12.30)."*

> *"That is a very good method. Because then the wildlife officers know our desires and our needs. We also know their procedures. Therefore, the forest will be conserved for future generations (villager, female, 38 years old, Galapitagala, 2022.12.11)."*

Moreover, the challenges to be experienced in using this integrated approach were also revealed in this study. The rising population, limited land resources, people's unlimited needs, their greediness, human perspective changes, lack of integration between responsible institutions and rural poverty are the main challenges among them.

However, the traditional knowledge which is depends on the sustainable use of the forest has become one of the best tools in the current forest conservation era due to the deep understanding on both forests management and local people's needs. Accordingly, despite of all the challenges which can occur on the way to implement this approach, it would be worthy to give a try. Because integrated approach can understand the core idea of needs of both

local community as well as forest conservation. Not only that, the sharing of the benefits is the major successful dimension of this approach.

In order to create such integrated approach, the aims of forest conservation policies, the need of the locals and empowerment local livelihoods should all come together. For that, efforts like localizing policies, usage of participatory rural appraisal to create policies, enhancement of integration between responsible institutions, encouragement of TK and related livelihoods, make people about the value of TK leading to social forestry should be highlighted within the procedure of integration. Through awareness, capacity building, policy development with locals, and recognition of their rights and traditional knowledge systems, the social forestry empowers communities that live in and near forested areas to participate in the sustainable use and management of those areas.

Ritigala Forest Reserve and local communities that have enormous traditional knowledge cannot be separated. This idea is the main concept of various forest conservation and management interventions in the world which could not be achieved to date in Sri Lanka. Because, the number of policies and interventions which have been implemented to achieve these goals have neglected the TK. Therefore, banning forest areas for local people is not the best solution. The survival of most local people depends on the forest and its product. Therefore, integrated approach could be the most promising solution to address the clash between forest management and TK while safe guarding both conservation and local people's needs by sharing benefits in a sustainable way.

5. Conclusion

Sri Lanka has the greatest history of conservation and management of forests. It has started before colonization when ancient people worshiped trees and rocks while having a very simple and austere way of life that does not harm the environment. Since then, Sri Lanka has evolved in forest conservation and management through numerous policies, regulations, and related conservation efforts. Even though these policies have prohibited local people from entering forest areas and utilizing their resources, a gradual depletion of forest can be seen.

Hence, a need for an integrated strategy has emerged as a potential remedy in that circumstance. The interest in TK in forest conservation has raised as a sustainable management tool in past years around the world. It has been identified as one of the best methods to conserve forest cover with the local people while Sri Lanka is neglecting this treasure and local people's ideas and their needs. Even though the usage and conservation of TK and local people

have been mentioned in almost all the every forest policies and efforts, there is a huge gap-disparity in the practical world.

Ritigala is one of three SNRs of Sri Lanka where people have co-existed with forest for thousands of years. SNR is the greatest concept for forest conservation and management. Nonetheless, neglecting the core idea of the local's requirements and the intimate relationship between local people and forest, the temporal changes of the local's perspective and behaviors, and ineffective forest conservation efforts create more and more distance between people and forest. It has eventually resulted in the clash between TK, local livelihoods and forest conservation. In order to face those challenges while conserving forest and empowering locals, integrated approach which can balance all these aspects could be a promising solution. More precisely, following solutions as an integrated approach could be a promising solution for this never-ending clash.

- Social forestry and community forestry.
  Both social forestry and community forestry concepts are directly related to the local communities, their requirements, and forest conservation and management. We could use the nearest forest lands of Ritigala beside SNR for the benefits of the local communities while managing them for beneficial purposes. Since the leading parties in this management process are locals, they could have a clear vision and knowledge about forest utilization and the importance of forest conservation while fulfilling their needs.
- Awareness programs.
  As the study revealed, one of the main consequences of the forest policies is turning locals into illegal users. Illegal hunting, illegal encroachment, illegal sand mining, and illegal NTFPs collection can be denoted as the results of creating distance between communities and forests. On the other hand, people's desires and behavior patterns have also changed with time. Enhancing awareness of valuable flora and fauna species, and the damages they could cause due to the shortsighted behavior of people and the importance of forest conservation can have a great influence on society in a positive manner.
- Identification and encouragement of traditional healers.
  One of the valuable foundations of forest conservation is the role of traditional healers and their generations. Identifying and encouraging them can help forest conservation. Here, we can give access for the identified traditional healers to go and utilize the forest in a sustainable manner. In that way, we can reduce most of

the illegal human activities around Ritigala since these healers hold enormous knowledge on forest conservation and management.

- Opening seasons for various fruits.
  Collecting fruit products like Nelli, Atabha, Gal siyabhala, Palu, and Veera is one of the main livelihood practices of the people in Ritigala. Opening seasons for the harvesting period could be more practical than banning people from utilizing those resources.
- Cultural tourism.
  Ritigala can be denoted as an outstanding and fascinating eco-tourist and cultural site, which is composed of beautiful and sacred forest areas and archaeological, and historical areas. In cultural tourism, tourists can enjoy these sites while local communities enjoy the interaction with tourists and the improvement of their livelihoods as well.
- Encouragement of TK and related practices.
  There is an inverse relationship between traditional knowledge and deforestation. That means that as the TK decreases, the destruction of forests increase. The future conservation and management of forests are seriously threatened by the low level of awareness on TK among outside society and institutional officials. Educating people about the value of traditional knowledge, the effectiveness of sustainable forest utilization related to them, and the emergency need to use TK as a sustainable forest management and conservation tool will lead to the successful implementation of the integrated approach.
- Enhancement of integration between responsible parties and community.
  The DWC, DFC, and Divisional Secretariat are the responsible parties for the conservation and management of Ritigala Forest. As identified in the study, the institutional relationship between these two institutions is at a very weak level. In the face of those weaknesses, the effectiveness of forest conservation policies also goes down. Therefore, it is essential to increase inter-institutional communication in the forest conservation and management processes.

References

Akurugoda, I.R. and Karunaratne, M. (2022). Addressing the challenge of deforestation in Sri Lanka: Potentials of sustainable forest governance through policy and institutional integration. XV WORLD FORESTRY CONGRESS: Building a Green, Healthy and Resilient Future with Forests. 2–6 May 2022. Coex, Seoul, Republic of Korea.

Asante, E. A., Ababio, S., & Boadu, K. B. (2017). The use of indigenous cultural practices by the Ashantis for the conservation of forests in Ghana. *SAGE Open*, *7*(1). https://doi.org/10.1177/2158244016687611

Bandara, T. W. (2017). *Environmental Laws and Policies in Sri Lanka*. Dayawansa Jayakody & Company.

Blockhus, J., Wickramasinghe, A., Nurse, M., & Ruiz-Perez, M. (2002). Non-Timber Forest Products and Local Livelihoods in Ritigsl, Sri Lanka. *Conservaition Issues in Asia*.

Boafo, Y. A., Saito, O., Kato, S., Kamiyama, C., Takeuchi, K., & Nakahara, M. (2015). The role of traditional ecological knowledge in ecosystem services management : the case of four rural communities in Northern Ghana. *International Journal of Biodiversity Science, Ecosystem Services and Management*, *3732*. https://doi.org/10.1080/21513732.2015.1124454

Chandananda, M. (2017). *The heritage of Ritigala*. Tharanji publications.

FAO. (2020). *Global Forest Resources Assessment 2020- key findings*. https://doi.org/10.4060/ca8753en

Karunaratne, M. (2013). *Forest conservation and management experiences of Sri Lanka: special reference with establishing forest buffer zone as a community forest management approach.* Author publication: Ratnapura. ISBN 978-955-44221-1-7.

Ministry of Agriculture, L. and F. (1995). *Sri Lanka Forestry Sector Master Plan: National Forestry Policy and excecutive summery*.

Parrotta, J., & Agnoletti, M. (2007). Traditional forest knowledge: Challenges and opportunities. *Forest Ecology and Management*, *249*(1–2), 1–4. https://doi.org/10.1016/j.foreco.2007.05.022

Parrotta, J., Yeo-Chang, Y., & Camacho, L. D. (2016). Traditional knowledge for sustainable forest management and provision of ecosystem services. *International Journal of Biodiversity Science, Ecosystem Services and Management*, *12*(1–2), 1–4. https://doi.org/10.1080/21513732.2016.1169580

Pei, S., Zhang, G., & Huai, H. (2009). Application of traditional knowledge in forest management: Ethnobotanical indicators of sustainable forest use. *Forest*

Ecology and Management, *257*(10). https://doi.org/10.1016/j.foreco.2009.01.003

Ramakrishnan, P. ., Rai, R. ., Katwal, R. P. ., & Mehndiratta, S. (2002). *Traditional Ecological Knowledge for managing Biosphere Reserves in south and Central Asia*. Mohan Primlani for Oxford & IBH Publishing Co. Pvt.

Sinthumule, N. I., & Mashau, M. L. (2020). Traditional ecological knowledge and practices for forest coservation in Thathe Vondo in Limpopo province, South Africa. *Global Ecology and Conservation*.

The Parliament of the Democratic Socialist Republic of Sri Lanka. (1937). *Flora and Fauna Protection Ordinance No.02 of 1937*.

Trivedi, P. ., & Raj, G. (1992). *Environmental Ecology*. Akashdeep Publishing House.

UNEP, & FAO. (2020). The State of the World's Forests 2020. *Forests, Biodiversity and People*, *14*(1), 165. https://doi.org/10.2307/208372

Wickramasighe, A. (1995). Comunity management of local forests: would it be a promising strategy to solve forest management problems in Sri Lanka. *Annual Forestry Symposium*.

Wijayawardhana, K. (2010). *Reserved Forests of Sri Lanka*. Pahan Publications.