

COMMUNITY PERCEPTION ON RAINFALL VARIABILITY IN THE KURUWITA DIVISIONAL SECRETARIAT IN RATNAPURA DISTRICT

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Abstract

The study aimed to analyse the community perception of the rainfall variability in the Kuruwita DSD since climate change-induced adverse weather effects are common in the area. The study is based on the primary data collected using a structured questionnaire considering 12 Grama Niladhari Divisions (GNDs) in the Kuruwita DSD. As revealed by the study, the majority of the sample population is aware that the rainfall pattern has changed in the area (70%) rainfall is not received in real-time (55%) means that the seasonal rainfall pattern in the area has changed, and high intensity of rainfall (58%) in the area. They have experienced an increasing number of rainy days per year, therefore a high amount of rainfall (77%). Comparatively, people who are living in the higher latitudinal areas are more knowledgeable about the rainfall variability than those in the lower latitudinal areas. The study suggests further research on community mitigation and adaptation methods to cope with rainfall variability.

Keywords: *Community Perception, Rainfall Variability, Kuruwita DSD, Seasonal Rainfall Pattern, Rainy Days*

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Introduction

Because of the location in the wet zone, Ratnapura district receives year-round rainfall and also faces the windward side of the central highland experiencing relatively high rainfall, especially during the southwest monsoon season. Extreme events of rainfall led the area to flood disaster and the researchers found that high intensity of rainfall and frequent floods during the last two decades have become a common feature in the area. Hence, identifying mitigation and adaptation methods to minimize the negative impact of rainfall variability and flood disaster is uttermost important. Understanding community perception of rainfall variability should be the initial stage of mitigation and adaptation planning. Therefore, this research aims to identify the community perception of seasonal rainfall variability in the Kuruwita Divisional Secretariat in Ratnapura District. In the literature, it could be seen that Navaratne et al. (2019) focused on understanding the perception of rainfall variability of the owners' small-scale tea plantations in Sri Lanka, while Ranasinghe (2019) focused on the paddy farmers in Sri Lanka. Both researchers pointed out that the local community has a clear perception of the rainfall variability in their living areas, however, their adaptative capacity to rainfall variability is low due to the lack of external support from the government and non-government agencies.

Objectives

To analyse the community perception of rainfall variability in the Kuruwita DSD.

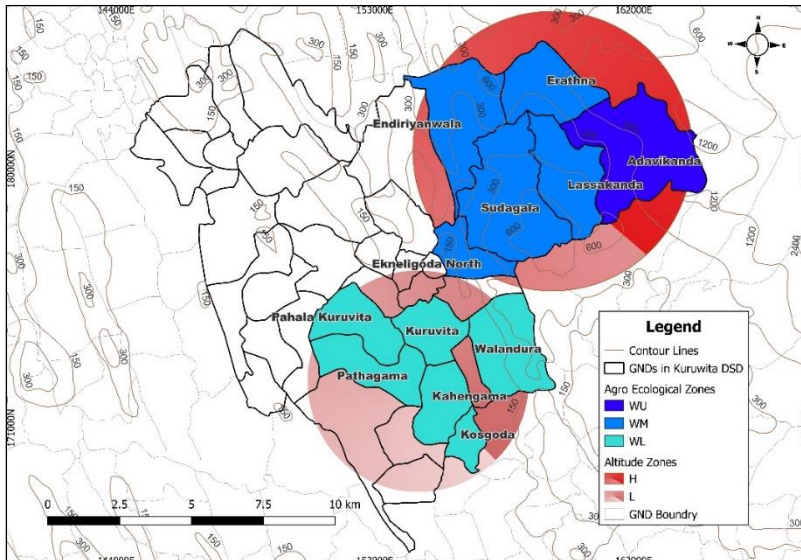
Material and Methods

Data and Sampling Method

The study is based on the primary data collected using a structured questionnaire considering 12 Grama Niladhari Divisions (GND) in the Kuruwita DSD. Approximately, 7293 households are located in the GND s, and among them, 120 households were considered as the sample based on the agro-ecological regions classification in Sri Lanka. Selected GNDs represent the altitudinal zones of Sri Lanka: Low-country, Mid-country, and Up-country. In the study, the GN divisions that are located in the Mid-country and Up-country named the high altitudinal zone (H) and Low-country considered the low altitudinal zone (L) (Figure 1) considering the extreme rainfall induces hazards; landslides are prominent in the Mid-country and Up-country and flood hazard is the common features in the Low-country.

Figure 1:

Study Area



Source: Based on the data of the Survey Department of Sri Lanka, 2018

Methods of Data Analysis

Open questions that are examined through the questionnaire are under the Likert's 5-point rating scale and the 'Mode' of the calculation is considered to verify the perception level of the community in terms of rainfall variability. Mann-Whitney U Test and Spearman's Rank Correlation Coefficient were also used to confirm the statistical significance of the analysis.

Results and Discussion

Eight questions were posed to gauge the community's perceptions about the seasonal rainfall variability in their living area and the results of the Likert Rating Scale are presented in Table 1. Those questions are comparable with the results of the research enabled in terms of the rainfall variability in Sri Lanka.

Table 1:*Community's Perception of Rainfall Variability*

Number	Statement	Likert's Scale					Total
		1	2	3	4	5	
1	Rainfall pattern has changed in the area	4	6	20	84	6	120
2	Rainfall receives in real time	7	66	28	19	0	120
3	High intensity of rainfall	1	14	30	69	6	120
4	The number of rainy days per year has increased	1	8	12	93	6	120
5	The number of days without rain has increased	2	80	19	16	3	120
6	The amount of rainfall received in a year has increased	1	11	13	93	2	120
7	In the Ratnapura district, flood events have increased compared to the past	1	15	20	81	3	120
8	In the Ratnapura district, landslide events have increased compared to the past	2	6	23	86	3	120

Source: Field Survey Data, 2022

As seen in Table 1, about 70% of the total sample agrees with the view that the rainfall pattern has changed in the area and 55% disagree with the idea that rainfall receives in real-time; this means that the seasonal rainfall pattern in the area has been changed. People are experiencing a high intensity of rainfall as agreed by 58% of the sample. A similar percentage of the sample (77%) agreed with the idea that the number of rainy days per year has increased as well as the increased amount of rainfall per year, therefore did not agree (67%) with the idea of the days without rains within a year has increased. Responses on increasing flood disasters and the occurrence of landslides in the recent past showed 67% and 72% respectively.

Identifying the Community Perception of Rainfall Variability Based on Altitudinal Zones

As depicted in Figure 1, altitudinal zones based on community perception of rainfall variability were analyzed using the Mann-Whitney U Test, and the results are shown in Table 2. The results show that community perception of rainfall variability in the study area is relatively higher in the high altitudinal GNDs. It could be revealed with the idea of the 'rainfall pattern has changed in the Ratnapura district' at the 95% significant level ($0.035 < 0.05$). Similar results are also found under the posed questions about 'high intensity of rainfall' (significant at the 99% level; $0.000 < 0.01$), also about the

‘increasing the days without rainfall’ (significant at the 99% level; $0.002 < 0.01$) and the idea of ‘increase of the amount of rainfall’ (significant at the 99% level; $0.004 < 0.01$). The perception about the ‘rainfall received in real-time is more agreed by the low country people.

Table 2:*Altitudinal Zones Based on Community Perception of Rainfall Variability*

Number	Statement	Altitudinal Zone	Mean Rank	Mann-Whitney ‘U’	Significance
1	Rainfall pattern has changed in the area	High	65.92	1475	0.035
		Low	55.08		
2	Rainfall receives in real time	High	61.22	1757	0.803
		Low	59.78		
3	High intensity of rainfall	High	74.14	981.5	0.000
		Low	46.86		
4	The number of rainy days per year has increased	High	63.90	1596	0.143
		Low	57.10		
5	The number of rainy days per year has increased	High	52.12	1297	0.002
		Low	68.88		
6	The amount of rainfall per year has increased	High	67.20	1398	0.004
		Low	53.80		
7	In the Ratnapura district, in the recent past, flood events have been increased	High	64.73	1546	0.107
		Low	56.27		
8	In the Rathnapura district, in the recent past landslide events have been increased	High	64.03	1588.5	0.160
		Low	56.98		

Source: Field Survey Data, 2022

Conclusion and Recommendations

Results of the study could be concluded that the community in the Kuruwita division is more aware of the rainfall variability in the area. The majority of the sample population is aware that the rainfall pattern has changed in the area (70%) rainfall is not received in real-time (55%) means that the seasonal rainfall pattern in the area has changed, and the high intensity of rainfall (58%) in the area. They have experienced an increasing number of rainy days per year, therefore a high amount of rainfall (77%). Comparatively, people who are living in the higher latitudinal areas are more knowledgeable about the rainfall variability than those in the lower latitudinal areas. The study suggests further research on community mitigation and adaptation methods to cope with rainfall variability.

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