Journal of Social Sciences and Humanities Review (JSSHR)
Vol. 3, Issue 4 (15-27)
© Author(s) December2018
ISSN: 2279-3933

Original Article

Community perception and response to drought risks in the Hambantota district in Sri Lanka

P.H.Amaraweera[1], Jayanthi De Silva[2] and S.K.M. Ali[3]

Abstract

The drought has been identified as the most frequent natural disaster in Sri Lanka. The effects of a drought can last for a long period of time resulting in various environmental and socio-economic losses. The current study aims to explore how the community perceive drought in Hambantota district which is one of the main drought-prone districts in Sri Lanka. It also examines in what ways the affected people respond to a drought incident. The study adopted a mixed methodology incorporating both quantitative and qualitative methods. First, the Standardized Precipitation Index (SPI) was computed using rainfall data of seventeen meteorological stations covering Hambantota district for the period from 1961 to 2015. The results indicate a higher drought intensity within several areas of the district. Based on the higher intensity, Lunugamvehera Divisional Secretariat Division was selected as the study area for the community survey to examine perception and response to drought. The community survey was conducted with a sample of 160 households which were selected using simple random sampling technique. An interviewer-administered questionnaire survey was conducted to collect data from the selected respondents. Data were analysed using descriptive statistics. Respondents have reported that they were affected by annual drought incidences while experiencing a severe drought once in every five years. The duration of an annual drought extended at least 5 months (from May to September) and severe drought extended 10 to 12 months (May to March). Therefore, the vast majority of affected people were perceived to be living in a drought risk area. 76.3 percent of respondents facing annual drought and 80.0 percent of respondents facing severe drought have perceived that the frequency of droughts has increased over time.

[1]Department of Geography, University of Ruhuna-Sri Lanka

palitha.amaraweera@gmail.com

[2] Department of Geography University of Colombo- Sri Lanka

[3]Department of Geography University of Ruhuna –Sri Lanka

Keywords: adaptation, community perception, drought risk, response

Journal of Social Sciences and Humanities Review (JSSHR)
Vol. 3, Issue 4 (15-27)

ISSN: 2279-3933

Original Article

INTRODUCTION

Under a changing and variable climate, the risk of drought is increasing worldwide. "Drought is one of the most complicated and least understood natural hazards, affecting more people than any other hazard" (Wilhite, 2000). Drought generally is defined as a temporary reduction in moisture availability, significantly below the normal for a specified period (ADPC, 2007). Causes of drought are related to climate variability and non-availability of water resources. It is mainly caused by low precipitation and high evaporation rates. Henny et al. (2007) point out that climate change is expected to affect precipitation, temperature and potential evapotranspiration, and thus, is likely to affect the occurrence and severity of meteorological droughts.

Although drought first appears as below-average rainfall within a normal part of the climate, it can develop as an extreme climatic event and turn into a hazardous phenomenon which can have a severe impact on people (McKee et al., 1993). As indicated by Arnell (2010), the human consequences of a drought depend not only on the intensity, duration and extent of the physical climatic anomaly, but also on the exposure and vulnerability of human systems, and often on the challenges posed by other pressures.

Perception refers to a range of judgements, beliefs and attitudes (Taylor et al., 1988). With regards to drought, the community perception is influenced by the characteristics of the specific episode and the context of the people who experience it (Heathcote, 1988; Diggs, 1991; Menghistu et al, 2018). As pointed out by Diggs (1991), drought might be more difficult to perceive as drought onset is slower than other disasters such as floods, tornadoes or hails. However, affected people, particularly farmers have strong opinions on its magnitude, frequency and timing since drought play a crucial role in their economic survival (Taylor et al. 1988; Bahta et al, 2016). The lack of adequate resources to prepare for and respond to drought has led to higher drought vulnerability (Bahta et al, 2016).

Studies have shown that the adoption of drought mitigation practices has also increased over time (Woudenberg et al., 2008). While some studies have noted the use of various preparedness and adaptation measures such as store up crop harvest, save money, migrate for employment and find alternative sources of income in order to mitigate drought impacts (Udmale et al., 2014; Bryan et.al., 2019), some other studies have highlighted the fact that perceiving climate variability and change does not always guarantee coping and adaptation responses, particularly among the rural people who face more binding constraints that deter adaptation decisions (Melka et al., 2015; Opiyo, et.al., 2015).

The exploration of existing literature indicated that there are limited studies that have elaborated community perception and response to drought in the context of Sri Lanka, which frequently affected by severe drought incidents. The Disaster Management Act No. 13 of 2005 in Sri Lanka has identified drought as the most frequent natural disaster out of its 21 natural or man-made disasters (Disaster Management Centre - DMC, 2005). Drought occurs in the South Eastern, North Central and North Western areas of Sri Lanka due to low rainfall during monsoons, particularly, from February

Journal of Social Sciences and Humanities Review (JSSHR)
Vol. 3, Issue 4 (15-27)

ISSN: 2279-3933

to April and on to September if the subsidiary rainy season from May to June is dry. According to the DMC (2015), the districts most prone to droughts include, Hambantota, KurunegalaMoneragala, Puttalam, Anuradhapura, Polonnaruwa, Mannar, Vavuniya, Badulla, Ratnapura, Ampara, Moneragala, NuwaraEliya and Batticaloa.

When considering the temporal drought incidences in Sri Lanka, there were several major droughts experienced during the periods of, 1935-1937, 1947-1949, 1953- 1956, 1965, 1974-1977, 1981-1983, 1985, 1991, 1995-1996, 2000-2001 and 2003-2004 (DMC,2005). Of all these major droughts, those during the periods 1953-1956, 1974-1977, 1981-1983 and 1995-1996 have caused major setbacks to the economy. The worst drought in the history of Sri Lanka took place in 2001 with another severe drought experienced in 2004 (DMC, 2005). According to DMC(2014), drought demonstrated a cyclic trend creating peaks at three to four year intervals in 1976,1979,1983,1986,1989,1991,1997, 2001, 2004, 2007, 2012 and 2013 in Sri Lanka.

RESEARCH OBJECTIVES

The main objective of this study was to examine the community perception and response to drought risks in the Hambantota district of Sri Lanka. The specific objectives were;

1. To identify the areas of higher drought frequency
2. To examine the community perception of droughts
3. To study the mitigation measures adopted by the affected population

MATERIALS AND METHODS

The study adopted a mixed research methodology using both quantitative and qualitative methods. The study used both primary and secondary data. In the first phase of the study, the rainfall data of seventeen meteorological stations covering Hambantota district for the period from 1961 to 2014 were collected from the Department of Meteorology. Using the rainfall data, the Standardized Precipitation Index (SPI) was computed to identify the drought intensity. The SPI by McKee et al. (1993) was the most used method for identifying drought intensity of an area. The study used the programme SPI calculator (SPI SL 6.exe) introduced by the National Drought Mitigation Centre (NDMC) to calculate SPI values. Using the calculated SPI values, necessary drought intensity maps were created using ArcView 10.1. Inverse Distance Weighted (IDW) interpolation method was applied to create the spatial distribution maps.

In the second phase, a community survey was conducted with 160 respondents in Lunugamvehera Divisional Secretariat Division which is one of the major drought-prone areas of the Hambantota district identified through the drought intensity analysis. The respondents were selected using probability sampling for which a simple random sampling technique was employed. The data and information were gathered through an interviewer-administered questionnaire survey conducted during November - December 2014. Observation method was also applied to identify the drought vulnerability and adaptation among the

Journal of Social Sciences and Humanities Review (JSSHR)
Vol. 3, Issue 4 (15-27)
© Author(s) December2018
ISSN: 2279-3933

affected community. The data were analysed descriptively.

RESULTS AND DISCUSSION

Drought intensity in Hambantota District

According to the calculated SPI values, two major drought events could be identified in the Hambantota district in the recent past. They were during the periods of 2000 - 2001 and 2013 -2014. Table 01 indicates the calculated SPI values for the selected Meteorological stations by two drought periods. Based on the SPI values, drought intensity maps were created to illustrate the spatial distribution of drought intensity in those two periods (Map 01- a and b). According to the maps, the highest drought intensity could be observed in the Western and North Eastern parts of the district. Lunugamvehera area which is located in the North Eastern part of the district is particularly important as a drought-affected area since the main livelihood of the people has been identified as agriculture and livestock in which drought could be a continuous challenge.

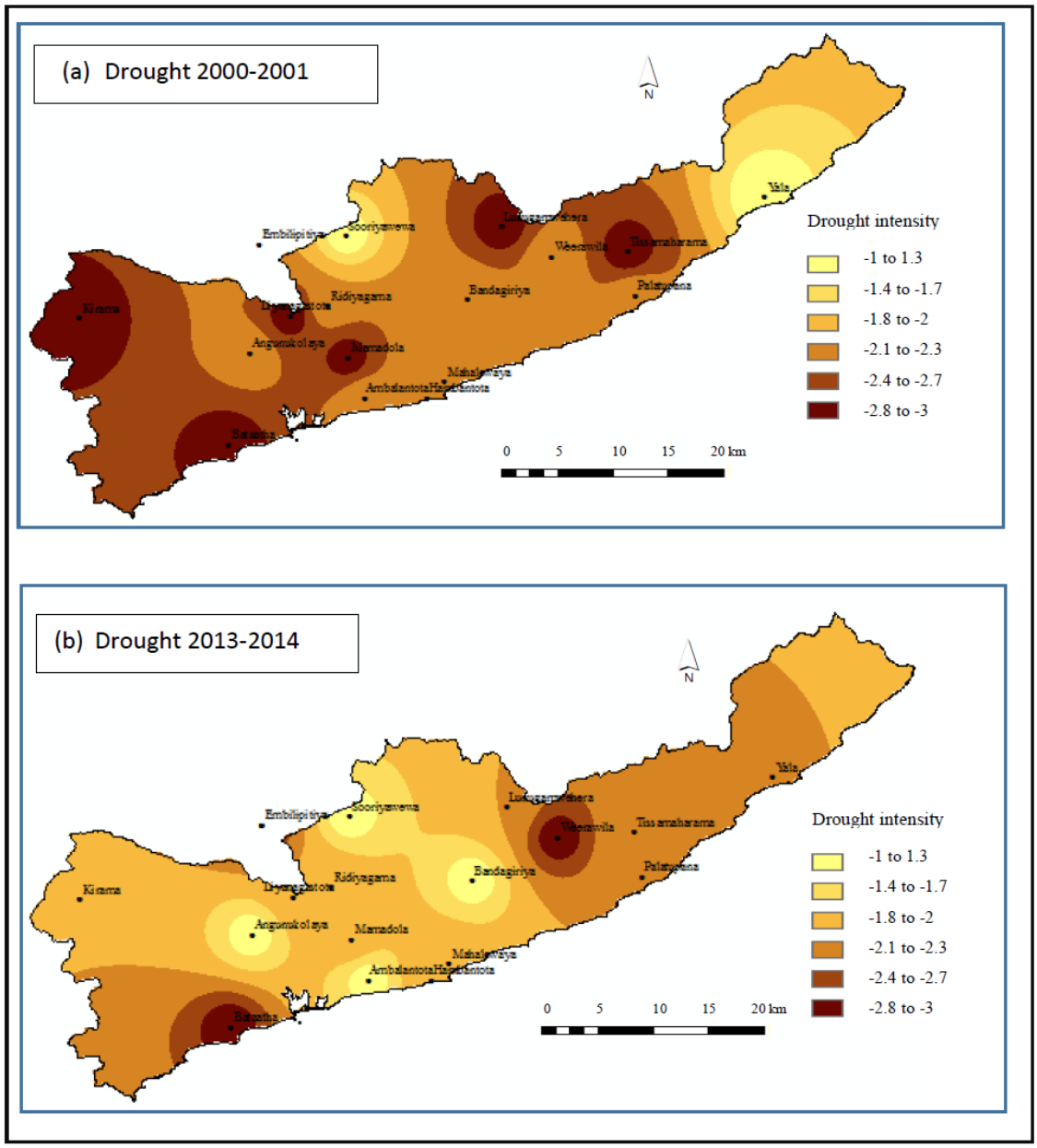
Table 01: Standard Precipitation Index for selected Meteorological Stations in Hambantota District by two drought periods

Meteorological Station Name	Longitude	Latitude	SPI Values 2000-2001	SPI Values 2013-2014
Ambalantota	81°01'45"	6°07'15"	-2.16	-1.31
Angunukolaya	80°53'03"	6°10'42"	-2.15	-1.03
Bandagiriya	81°09'26"	6°14'43"	-2.23	-1.34
Bataata	80°51'29"	6°03'44"	-3.09	-2.83
Embilipitiya	80°53'50"	6°18'53"	-2.49	-2.63
Hambantota	81°06'26"	6°07'14"	-2.12	-2.46
Kirama	80°40'15"	6°13'18"	-2.82	-2.08
Liyanagahatota	80°56'06"	6°13'29"	-2.81	-2.12
Lunugamwehera	81°12'02"	6°20'15"	-2.82	-2.38
Mahalewaya	81°07'44"	6°08'28"	-2.18	-1.84
Palatupana	81°22'10"	6°14'58"	-2.33	-2.26
Mamadala	81°00'27"	6°10'18"	-2.81	-2.01
Ridiyagama	80°58'58"	6°14'16"	-2.16	-1.86
Sooriyawewa	81°00'20"	6°19'32"	-1.25	-1.36
Tissamaharama	81°21'31"	6°18'21"	-2.81	-2.21
Weeravila	81°15'52"	6°17'54"	-2.21	-2.92
Yala	81°31'56"	6°22'26"	-1.01	-2.32

Source: Prepared by Author using the calculated SPI

Journal of Social Sciences and Humanities Review (JSSHR)
Vol. 3, Issue 4 (15-27)
© Author(s) December2018
ISSN: 2279-3933

Original Article



Map 01: Spatial Distribution of Drought Intensity in Hambantota District

Source: Prepared by author using the calculated SPI

Community perception and response

The community perception and responsesare presented descriptively using the data derived through the community survey.

Socio-demographic profile of the respondents

The sample of this study comprised of 82.0 percent of males and 18.0 percent of females, with an age ranged from 32 years to 76 years. Nearly 50.0 percent of respondents have lived in the area for more than 40 years. A major source of income for the majority of the

Journal of Social Sciences and Humanities Review (JSSHR)
Vol. 3, Issue 4 (15-27)
© Author(s) December2018
ISSN: 2279-3933

respondents (72.0%) was farming. Another 16.0 percent of the respondents were employed as farm labourers and related activities while 7.0 percent were engaged in livestock activities, 3.0 percent in small trading activities and 2.0 percent in government services. The majority (78.0%) of the farmers were engaged in a combination of rainfed and irrigated farming. Only 3.0 percent of them practice irrigation farming while 19.0 percent of farmers reported as engaged in rain-fed cultivation alone.

Respondents' perception of drought

Respondents have defined 'drought' based on their experiences about the physical environment, type and degree of involvement in agricultural activities and level of impact. The respondents' self-perceived definitions are shown in Table 02. Since the respondents have provided multiple responses, a total of 784 responses were recorded

Table 02: Respondents' perception of drought

Perception	Number	Percentage of respondents
Lack of rain	139	86.9
Drying up of water sources	131	81.9
Water scarcity	133	83.2
Destruction of agricultural activities due to lack of water	122	76.2
Makes surrounding more drier	132	82.4
Cessation of rain during the rainy season	127	79.4
Total responses	784	
Total respondents	160	

Source: Field Survey, 2014

According to Table 02, the majority of the respondents (86.9%) have defined drought as "less or no rain over the rainy season" (during Northeast Monsoon/ *Maha* season) whilst 81.9 percent indicating it as drying up of water sources. 79.4 percent defined drought as "cessation of rain during the rainy season" and not getting enough water for the area. Another 83.2 percent of respondents defined drought as "water scarcity" for various uses mainly for drinking, home use, agricultural activities, and livestock. According to 82.4 percent of respondents, drought is "an incident or situation which makes their surrounding drier than usual". Some defined drought as "a destruction of agricultural activities" perceiving the situation in relation to their economic activities.

Respondents' experiences of drought

The study found that all the respondents had been affected by drought causing an adverse impact on their crop production, livestock and other socio-economic activities. They have reported that they were affected by annual drought incidences while experiencing a severe drought once in every five years. The duration of a normal drought extended at least 5 months (from May to September) and severe drought extended 10 to 12 months (May to March). Therefore, the vast majority of affected people were perceived to be living in a drought risk area.

Original Article

Furthermore, the majority of the respondents (76.3% of annual drought and 80% of severe drought) have perceived that the frequency of droughts has increased over time. A considerable percentage of respondents (46.2%) in the study area believed that they were highly vulnerable to drought. While 41.9 percent of them were perceived as partially vulnerable,9.4 percent of respondents were reported to be slightly vulnerable. Those who were believed to be very slightly vulnerable to drought were very few at 2.5 percent out of all the respondents.

Perception of awareness about the drought

Drought awareness is an important aspect of the adaptation to the disaster. Thus, the question: "How do you get information about the drought in your area?" was raised to identify the sources of information received by the respondents in this study. Since the respondents have been receiving information from various sources, they have given multiple responses to the question and thus, a total of 374 responses were recorded. Figure 01 illustrates the responses given by them.

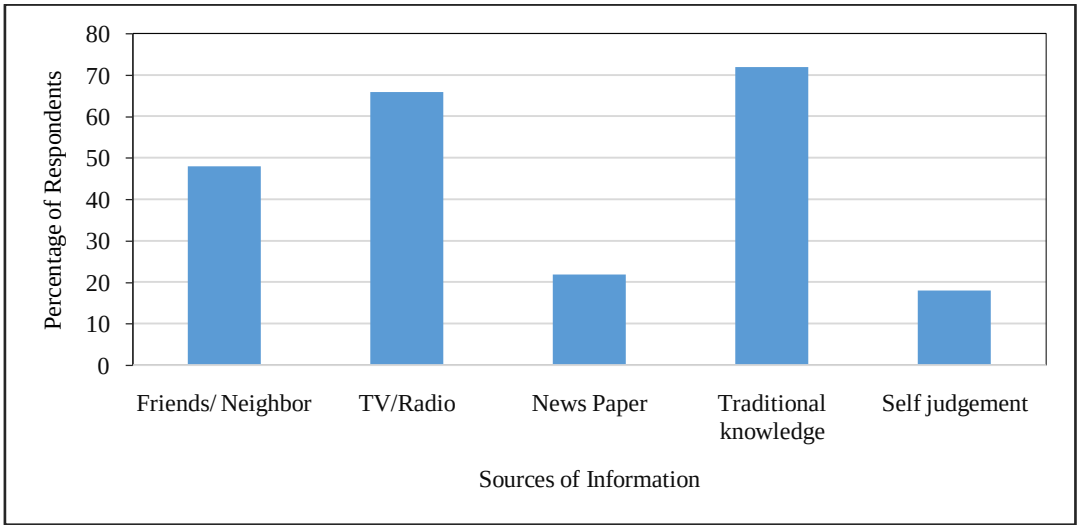


Figure 1: Sources of information on drought
Source: Field Survey, 2014

Figure 01 indicates that the majority of the respondents (79.0%) have perceived about the drought using their traditional knowledge and experience, followed by the information received from media (television and radio – 66.0%, newspapers – 22.0%). Another 48.0 percent received their information from friends and neighbours. Only 18.0 percent of respondents perceived the drought using their self-judgment after observing the current climatic situation.

Perception of drought impacts

Perception ofsocio-economic impacts

The drought has a severe impact on the socio-economic condition of the affected areas in Sri Lanka (Disaster Management Center, 2012; Central Bank of Sri Lanka, 2014; Gunawardena and Darmasiri, 2015). According to the respondents, the highest affected sectors were household income (86.9%)

Original Article

agricultural/livestock production (75.6%), followed by expenses for the basic needs (70.0%), indebtedness (67.9%) and food consumption (66.9%). It was found that agriculture, livestock, and agricultural labour supply activities are the main income sources in this area. The majority of the respondents were in food crop farming (72.0%) while 16.0 percent were engaged as agricultural wage labourers, and 7.0 percent in livestock activities. All the respondents in the farming sector reported that their agricultural production was affected by drought. The majority of the farmers (64%) reported that temperature has been increasing day by day during the last three decades. All of the respondents in the farmingsector reported that agricultural production decreased during the drought period due to lack of rainfall and higher temperature. Livestock farmers were also had been experiencing adverse impacts such as the death of livestock due to the scarcity of food and water, poor health conditions of animals and declining price for their products. The influence on the agricultural sector has been indirectly affecting the agricultural wage labour sector because their opportunities for continued employment were disrupted. According to their perceptions, they were facing an unemployed situation for long periods which in turn affect them negatively by getting into more and more debts and limiting food leading to physical and mental health problems.

Almost 59.0 percent of respondents indicated that the health status of their family was also affected by the last major droughts in 2001 and 2004. About 55.0 percent of respondents stated that drought has an impact on their children's education too. Children were not performing well during the drought periods due to the uncomfortable environmental situation in the area. On the other hand, a disruption in education could be identified due to the parent's inability to provide children's educational requirements due to the declining household income. Apart from these socio-economic impacts, negative psychological behaviours were identified due to the drought in the area. Findings revealed that 53.7 percent of affected people have felt a feeling of hopelessness after the drought because of the disruption they faced in their day to day activities.

Impact on water consumption

The impact of drought on the accessibility to drinking and other water sources were explored using a series of questions and compared the information between drought and normal periods in order to find the differences. Respondents were specifically asked if the drinking water and other water sources had changed during the drought. All households reported a marked change in their sources of drinking water. In a normal period, they have been using purified waterdistributed by the rural water supply project, but in drought periods, all of them had to use drinking water distributed by a bowser. The service was provided to them by the Divisional Secretariat office or Non-Governmental Organizations working in the area. People have to spend extra time bringing water from a public tank or waiting for the bowser since the distribution practices were not regular. Sometimes they have to travel a long distance to obtain drinking water during the drought periods.

The respondents use water from tube wells for other household activities. However, during drought periods, tube

Original Article

wells also cannot provide adequate water to all the households in the area. It was identified that people wash their clothes and have a bath in the tanks. Most of the respondents have stated that they have to travel more than two kilometres to reach this water source during the drought season which is a longer distance than in a normal period. As revealed by respondents, to make the matters worse, the tanks also become dry during the drought period and gets muddy with buffalos entering the premises. In addition, water quality also changes. 16.6 percent of respondents stated that they spend money to buy water from water distributors for drinking and other purposes during the drought period and mentioned that it was an extra burden. The findings revealed that the water sources, the travel distance for water, the quality of water, the cost for collecting water change during a period of drought compared to, a normal period. Thus, it was quite clear that the people in the study area were giving extra effort during the drought season to collect water for their needs.

Perception of environmental impacts

Drought affects the environment in a number of ways. Drought causes reduction of lake water and groundwater levels. It evaporates soil water, which has negative impacts on soil fertility. The main environmental impact derived through the survey was a water scarcity in surface water bodies (92.5%). The respondents have stated that the surface water bodies (tanks) in the area have completely dried up during the drought periods. The problem of poor water quality was perceived as an impact of 47.5 percent of respondents in the area. About 70.0 percent of the respondents have perceived that they experience an increase in the temperature during the drought period compared to the normal period. They have noted that the vegetation and wildlife were also affected by the drought. While 61.2 percent have observed pasture degradation, 67.5 percent have indicated the dried up of vegetation in their home gardens, falling withered leaves out of the trees and turning the greenery into various shades of brown.

Adaptation measures used by respondents

Drought adaptation measures were identified in two levels such as household and institutional level. At the household level, respondents have used various drought preparedness and adaptation measures to mitigate the impacts of drought. Various drought preparedness measures adopted by respondents are shown in Table 03. Since the respondents have given multiple responses to the question, a total of 642 responses were recorded.

Table 03: Drought adaptation measures at the household level

Adaptation measures	Number responses	Percentage of respondents
Store crop harvest	122	76.4
Store crop residues for livestock	11	6.9
Save money	77	48.3
Sell livestock	10	6.2
Migration for employment	37	23.2

Original Article

Seek other income generating methods	28	17.6
Water harvesting before the drought	140	87.9
Buy water from private water distributors	26	16.3
Less water consumption for household activities	118	73.7
Changing to low water crops	73	45.7
Total responses	642	
Total respondents	160	

Source: Field Survey, 2014

Drought has mainly affected the agricultural sector, especially crop production. Thus, the study revealed that about 76.4 percent of farmers preferred not to sell their products and have stored them in anticipated drought periods. 45.7 percent of farmers have changed their cultivation to low water consuming agricultural crops such as gingerly. About 6.9 percent of respondents stored crop residues to feed the livestock during the anticipated drought and 48.3 percent of farmers took measures to reduce their expenses to save money. Out of the total respondents, 87.0 percent adopted a rainwater harvesting system before the drought and practice low water consumption during the drought periods. 73.3 percent of respondents reduced water consumption for their daily activities even in the normal period to deal with anticipated drought. Of those, 16.3 percent of respondents buy water from private water distributors which requires to spend additional money and time. However, this can be identified as a new income source for private water distributors. Furthermore, respondents seek various options such as migration for employment (23.2%), seeking non-agricultural income sources (17.6%) and selling livestock (6.2%) to adapt to the impacts of severe and long-term droughts.

Besides household level adaptation measures, institutional adaptation strategies play a crucial role in adapting to drought. As a response to serious drought events at Lunugamvehera DS division in the Hambantota district, the government and non-governmental organizations have undertaken various relief measures, which included the provision of employment, the supply of drinking water, providing public water tanks and distribution of dry food. The government has also provided agricultural loans at low-interest rates for the subsequent cultivation season. Furthermore, the government and non-governmental agencies supported to build rainwater harvesting tanks for every household in this area. According to the provision of employment program, respondents have engaged in various activities such as maintenance of canals, renovation of tanks, road development in rural areas and other related activities, where they were paid only on daily basis. Although, the wage received was not adequate for daily family needs, the government designed this method to serve two purposes a) to create employment opportunities for drought-affected households and b) to build drought resilience (Divisional Secretariat Office, Lunugamvehera, 2014).

All the affected households were provided with water storage tanks under the government drought relief measures. Under this system, water was delivered to each household unit and public water

Original Article

storage tanks with a capacity of 1000 litres. However, the respondents were not satisfied with this method, because the distribution of water to common tanks was irregular (e.g. once in two days or once a week). Respondents also complained that water supplied to the common tank was inadequate for the entire population in the area. Rainwater harvesting tanking system was introduced by the government and non-governmental agencies to harvest rainwater. However, this aim is not properly fulfilled because most of the households (64.2%) preferred to use these tanks to collect water from private distributors by paying money.

CONCLUSIONS AND POLICY IMPLICATIONS

This paper aimed to examine the community perception and response to drought risks in the Hambantota district of Sri Lanka. The findings revealed two major periods of drought and, based on those two periods, the findings were derived through a community survey conducted with the highly affected community in Lunugamvehera area in Hambantota district. The respondents have reported that they were affected by annual drought incidences while experiencing a severe drought once in every five years. The duration of an annual drought extended at least 5 months (from May to September) and severe drought extended 10 to 12 months (May to March). Therefore, the vast majority of affected people were perceived to be living in a drought risk area. According to the survey, most of the respondents have perceived that the frequency of droughts has increased over time. It was found that the community had been affected by drought causing adverse impacts on their crop production, livestock and other socio-economic activities. Reduction of household income, declining agricultural and livestock production, indebtedness, limited food preferences, adverse health issues, disruption of children's education and feeling of hopelessness were the main socio-economic impacts identified in this study. The environmental impacts such as water scarcity in the surface water bodies, increased temperature, pasture degradation and destruction of vegetation in home gardens were also found to be high during a drought. Findings revealed both household and institutional level measures of adaptation of drought. At the household level, the major measures such as, water harvesting before the drought, storage of crop harvest for future consumption, saving water through low water consumption, saving money for the period of drought and changing to low-water consumed crops during drought seasons could be identified in the area. In addition, activities such as buying water from private water distributors for daily needs, seeking other-income generating methods and migrating for employment to other parts of the country have also been mentioned by the respondents. At the institutional level, the community resilience to drought has been maintained through various activities by the government and non-governmental organizations. Some of the measures included the provision of employment, supply of drinking water, provision of public water tanks, distribution of dry food and provision of agricultural loans with lower-interest payments and extended recovery periods. It was also found that institutional support was provided to build rainwater harvesting tanks for every household.

Several policy implications could be highlighted in view of the derived

Original Article

findings and conclusions. Since the study revealed a considerable level of disruption in economic activities, it is needed to introduce a sustainable insurance scheme under the accountability of the government to impede the negative impacts of drought and to ensure the income security of the affected households.

The sources of household drinking water seem to be threatened annually in drought-prone areas of Sri Lanka. Although the temporary measures are being undertaken to solve the problem at the time of the drought season, a sustainable water delivery system has not been planned or implemented so far. The adequacy of the distribution of clean water among the affected households was also inefficient according to the views of the people. The water as a basic human need can be transformed as a critical health risk too. Therefore an adequate drinking water management system should be planned, implemented and monitored within drought-prone areas.

The study could be observed that the rainwater harvesting tanks were established in every household in the study area as an adaptation measure to store rainwater for uses other than drinking. However, the study revealed that the people tended to either abandon the tanks without storing rainwater or using them for storage of water distributed by the private water suppliers during the drought season. Since the expected outcome of the rainwater harvesting system has been ignored by the people, a formal monitoring strategy should be implemented at the same time with planned programmes to control the misuse of facilities provided by the authorities.

References

ADPC, (2007). *Climate Variability and Change: Adaptation to drought in Bangladesh.* Asian Disaster Preparedness Centre & Food and Agricultural Organization, Rome, Italy.

Arnell, N.W.(2010). *Climate Change and Drought. Options Mediterranean's Series A*, No 80, University of Reading, UK.

Bahta, Y.T., Jordaan, A., Muyambo, F. (2016). Communal farmers' perception of drought in South Africa: Policy implication for drought reduction. *International Journal of Disaster Risk Reduction,* Vol 20, Science Direct, pp 39-50

Bryan, K., Ward, S., Barr, S. and Butler, D. (2019). Coping with Drought: Perceptions, Intentions and Decision- Stage of South West England Household. *Water Resources Management,Vol.33*, Springer, Netherlands. pp 1185-1202

Central Bank of Sri Lanka. (2014). *Sri Lanka Socio-Economic Data*. Statistics Department of Central Bank, Sri Lanka.

Diggs, D.M. (1991). Drought Experience and Perception of Climate Change among Great Plains Farmers. *Great Plains Research: A Journal of Natural and Social Sciences, Vol 1, No 1*, University of Nebraska, Lincoln, pp 114-132

DMC. (2005). *Annual Disaster Statistical Report 2005*, Disaster Management Center, Sri Lanka, Colombo.

Original Article

DMC. (2012). *Hazard Profile of Sri Lanka*. Disaster Management Center, Ministry of DisasterManagement, Colombo, Sri Lanka.

DMC. (2014). *Annual Report*, Disaster Information Management System Sri Lanka.

DMC. (2015). *Annual Disaster Statistics*, Disaster Management Center, www.dmc.lk(Accessed, September 2015)

Divisional Secretariat Office. (2014). *Resource Profile*. Lunugamvehera Divisional Secretariat Office, Hambantota, Sri Lanka.

Gunawardana, L. M. A. P. and Dharmasiri, L. M. (2015). Droughts Hasard and Managing Its Impacts through the Disaster Management Approach: A Study in the North Central Province of Sri Lanka. *In Proceedings of the International Research Symposium, Rajarata University of Sri Lanka*, 2015, pp 333-343

Heathcote, R.L. (1988). Drought in Australia: Still a Problem of perception. *Geojournal, Vol 16(4)*, Springer, pp 387-397

Henny, A. J. L., Tallaksen, L. M. and Rees, G. (2007). *Droughts and Climate Change*. Commission Staff Working Document, Commission of the European Communities, Belgium.

Menghistu, H.T., Mersha, T.T. andAbraha, A.Z. (2018). Farmers' perception of drought and its socioeconomic impact: the case of Tigray and Afar Regions of Ethiopia, *Journal of Applied Animal Research, 46(1*), pp 1023-1031 DOI: 10.1080/09712119.2018.1450752

McKee, T. B., Doesken, N. J. and Kleist, J. (1993). The relationship of drought frequency and duration to time scales. *In 8th Conference on Applied Climatology. American Meteorological Society*, Washington DC, pp 179-184.

Melka, Y.,Kessa, H., Ketema, M., Abebaw, D. andSchmiedel, U. (2015). The effect of drought risk perception on local people coping decisions in the Central Rift Valley of Ethiopia. *Journal of Development and Agricultural Economics, Vol, 7(9)*,pp 292-302. DOI: 10.5897/JDAE2015.0674

Opiyo, F., Wasanga, O., Nayangito, M., Schilling. J. and Munang, R. (2015). Drought Adaptation and Coping Strategies Among the Turkana Pastoralists of Northen Kenya. *International Journal of Disaster Risk Sciences, Vol, 06 (3)*, Springer, pp 295-309

Taylor, J.G., Stewart, T.R. and Downtown, M. (1988). Perceptions of Drought in the Ogallala Aquifer Region. *Environment and Behaviour, Vol 20(20*), pp 150-175

Udmale, P., Ichikawa, Y., Manandhar, S., Ishidaira, H. and Kiem, A.S. (2014). Farmers' perception of drought impacts, local adaptation and administrative

Original Article

mitigation measures in Maharashtra State, India. *International Journal of Disaster Risk Reduction, 10(2014)*, Elsevier Ltd, pp 250-269

Wilhite, D. A. (2000). Drought as a natural hazard: concepts and definitions. In: Whilhite D. (eds.) *Drought: a global assessment*, vol1. Routledge Publishers, London. pp 3-18

Woundenberg, D.L., Wilhite, D.A. and Hayes, M.J. (2008). Perception of Drought Hazard and its sociological impacts in South-Central Nebraska, Great Plains Research: *A Journal of Natural and Social Sciences, Vol 8 (1)*, University of Nebraska, Lincoln, pp 93-102