Journal of Agriculture, Food, Environment and Animal Sciences
Tarım, Gıda, Çevre ve Hayvancılık Bilimleri Dergisi
http://www.jafeas.com, ISSN: 2757-5659

J. Agric. Food, Environ. Anim. Sci.
6(1): 65-83, 2025

A Comprehensive Analysis of the Socio-Economic and Environmental Impacts of the Prolonged Dry Season in Lonsdale Village and Brother's Village, East Bank Berbice, Guyana

Ameera Fatema WAJIDALLY[1], Nasrudeen ALLY[2*]

[1-]Department of Biology, Faculty of Natural Sciences, University of Guyana, P. O. Box 10 1110, Turkeyen Campus, Greater Georgetown, Guyana, SOUTH AMERICA
[2-]Environmental Department, Guyana Geology and Mines Commission, P. O. Box 1028, High and Princes Street, Georgetown, GUYANA

[1]https://orcid.org/0009-0004-4877-8417, [2]https://orcid.org/0000-0002-7345-6207

*Corresponding author: nasrudeen.ally123@gmail.com

Research Article

Article History:
Received:7 August 2024
Accepted:7 March 2025
Published online: 01 June 2025

***Keywords*:**
Climate Change
Prolonged Dry Season
Agriculture

ABSTRACT

This paper presents a comprehensive analysis of the socio-economic and environmental impacts of the prolonged dry season in Lonsdale Village and Brother's Village, East Bank Berbice, Guyana. The research employed a survey method using questionnaires to obtain primary qualitative and quantitative data on the socio-economic and environmental impacts, constraints and coping mechanisms on the current prolonged dry season. The findings of research indicated majority of the respondents strongly agreed drug abuse was the primary social impact, low yields/decrease in sales was the primary economic impact and soil composition alteration was the primary environmental impact. In addition, the data revealed majority of the respondents (73.7%) experienced constraints due to the prolonged dry season in the study communities. Majority of the respondents strongly agreed social breakdown in family life (school drop-out, domestic abuse) as the primary social constraint, reduction of finances in household as the primary economic constraint and no pasture for livestock grazing as the primary environmental constraint. Moreover, majority of the respondents disagreed family member migrated from the study communities due to the prolonged dry season. The data also revealed for those that did migrate, employment was the main reason. The findings indicated majority of the respondents selected provision of counselling services as the primary social coping mechanism, financial support as the primary economic coping mechanism and crop rotation as the primary environmental coping mechanism.

To Cite : Wajidally AF, Ally N., 2025. A Comprehensive Analysis of the Socio-Economic and Environmental Impacts of the Prolonged Dry Season in Lonsdale Village and Brother's Village, East Bank Berbice, Guyana. Agriculture, Food, Environment and Animal Sciences, 6(1): 65-83.

INTRODUCTION

Climate change has contributed to an increase in risk threatening the socio-economic and environmental domains of rural communities (Core Environment Program, 2014). It is anticipated the variability in weather has implications on agricultural yields, availability of fresh water, biodiversity and eco-system services (Core Environment Program, 2014). It is evident these facets that are threatened are synonymous with rural communities. The study communities in this research are rural with high dependence on rain-fed agriculture. Prolonged dry season refers to the pattern and precipitation deficit that last for more than six months (America Cyber Defense Agency, 2024). In recent times, Guyana has experienced prolonged dry spells which has been detrimental to rural communities. According to the report published by Core Environment Program, 2014, conducted within the Greater Mekong Sub Region, it was highlighted climate change impacts falls disproportionately on the poor. Rural communities are vulnerable to prolonged dry season given their dependence on rain-fed agriculture. Seventy percent (70%) of the world's poor people live in rural areas and rural livelihoods are especially vulnerable to climate change (Muzari et al., 2014).

There is direct correlation between prolonged dry season and rural communities. Agriculture in rural communities provide food and economic sustenance (Maryville University, 2022). Due to these communities' high dependence on rain-fed agriculture, prolonged dry season contributes to the reduction in water availability and degradation in soil conditions. This affects yields threatening food security, food availability and the economy of these communities. As such, there are increased cases of malnutrition and susceptibility to infectious diseases within affected communities due to the lack of proper nutrients. It is evident the implications of prolonged dry seasons are severe on rural communities. Therefore, this research was selected to determine the socio-economic and environmental impacts of the prolonged dry season on two rural communities along the East Bank of Berbice. It is the basis that the findings of this research will provide a collective approach to provide tangible solutions to assist the study communities. Simultaneously, the researcher intends to conduct similar studies within other rural communities to provide bottom-up solutions to assist residents.

MATERIAL and METHOD

Study Area

The study was conducted in Lonsdale Village (06°10′41″ latitude N. 57°32′46″ longitude W) and Brother's Village (06°10′45″ latitude N. 57°32′27″ longitude W), East Bank Berbice. Both villages collectively comprise of 112 households with a population of approximately 270 persons. These are rural communities with agricultural activities being one of the major form of employment.

Sampling Technique

There are approximately sixty-five (65) households in Lonsdale Village and forty-seven (47) households in Brothers Village. The approximate population of Lonsdale Village is 160 residents whilst Brothers Village has an approximate population of 110 residents. The sample calculator Raosoft Inc. was used to calculate the sample size for each respective study community. The sample size calculation for each study community was calculated with confidence level of 95%, margin of error at 5% and the response distribution at 50%. The sample size for Lonsdale Village was 114 residents and 86 residents for Brother's Village, East Bank Berbice. This research incorporated the random sampling technique. With the use of this kind of sampling technique, every respondent of the population has an equal chance of being selected without prejudice (New Castle University, 2023). The questionnaires were administered to the sample population in the study communities. The residents were selected without any bias and favoritism. The population for the research is residents in the communities; Lonsdale Village and Brother's Village. The survey was conducted between May 10th-15th, 2024. Respondents were given six (6) days to complete and return the questionnaires. A total of 102 questionnaires were returned from Lonsdale Village whilst 77 questionnaires were returned from Brother's Village.

The research incorporated the cross-sectional research design to obtain qualitative data. Primary data was collected using the questionnaire. Journal articles, case studies and reports were reviewed to ascertain existing information concerning the research objectives. The questionnaire comprised of four (4) sections with a total of twelve (12) questions. Section A focused on bio-data of the respondents. Section B focused on the socio-economic and environmental impacts of the current prolonged dry season. Section C focused on the constraints residents experienced due to socio-economic and environmental impacts of the current prolonged dry season. Section D focused on possible coping mechanisms to alleviate the socio-economic and environmental constraints due to the impacts of the current prolonged dry season. In order to determine the degree to which respondents strongly agreed, agreed, disagreed, or strongly disagreed with a particular item, the researcher used the Likert Scale. The Statistical Package for the Social Sciences, or SPSS version 20.0, was used to analyze the data collected for the investigation. This application can handle big datasets and intricate analyses. The data was reviewed for mistakes before being entered into SPSS. The SPSS program produced tables, charts, and graphs to illustrate the findings. In order to determine and analyze the data distribution and derive inferences from the findings, the researcher employed descriptive statistics, namely the mean, mode, standard deviation, and frequency.

RESULTS and DISCUSSION

Figure 1 above revealed the occupation of respondents surveyed from the study communities. It is evident from the data collected, majority of the respondents (32%) are employed by the private sector. This accounted for fifty-eight of the respondents surveyed. Famers accounted for forty-one respondents (23%) whilst forty-respondents (22%) were unemployed. Additionally, only fourteen of the respondents (8%) were small business owners. The mean of 3.23 does not fully represent the distribution of the dataset. Moreover, the modal value of 4.0 indicated majority of the respondents were Private Sector Worker. The standard deviation of 1.47 showed the data was widely distributed from the mean. This enhanced the justification of using the modal value to accurately represent the dataset.

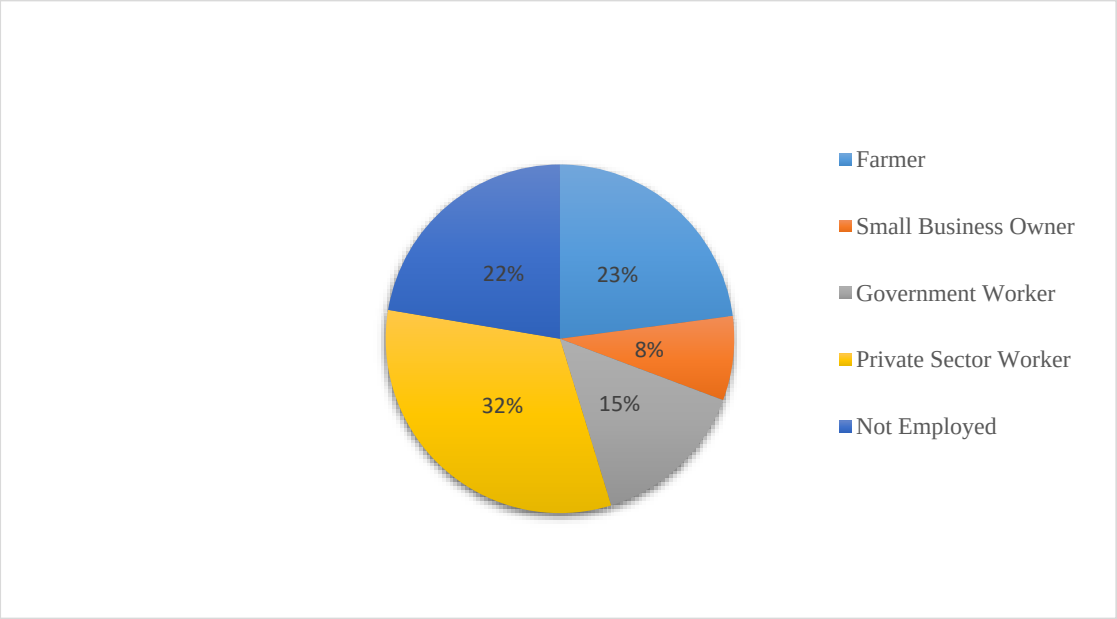

Figure 1. Occupation of respondents from the study communities

The study communities are rural with farming as a primary source of employment. However, the dataset indicated many of the respondents work in the private sector. Given the challenges of the prolonged dry season, respondents have taken jobs working as security guards, sales representatives, handymen and so forth at private institutions. Respondents that do not have required qualifications to function in the private or public sectors are forced to remain unemployed. Hence, the dataset contained a high number of unemployed responses. Additionally, a small fraction of the respondents were government workers and small business owners. The government workers refer to those respondents that are employed and paid a salary by the government. This include but not limited to nurses, teachers, policemen, doctors and so forth. The small business owners highlighted respondents considered to be

entrepreneurial owning commodities retail shops, mechanical repair business, welding and fabricating business and construction business.

Table 1. Socio-Economic and environmental impacts of the current prolonged dry season within Lonsdale Village and Brothers Village, East Bank Berbice, Guyana

Factors	Strongly Agree	Agree	Disagree	Strongly Disagree	Mean	Standard Deviation
Social Impacts						
Loss of Employment	44 (24.6%)	71 (39.7%)	35 (19.6%)	29 (16.2%)	2.73	1.10
Breakdown in Health Condition	20 (11.2%)	47 (26.3%)	10 (56.4%)	11(6.1%)	2.42	0.77
Drug Abuse	96 (53.6%)	31 (17.3%)	39 (21.8%)	13 (7.3%)	3.17	1.10
Economic Impacts						
Low Yields/Decrease in Sales	137 (76.5%)	7 (3.9%)	23 (12.8%)	12 (6.7%)	3.50	0.95
Economic Loss	136 (76%)	30 (16.8%)	10 (5.6%)	3 (1.7%)	3.67	0.66
Increase in Debts	51 (28.5%)	81 (45.3%)	28 (15.6%)	19 (10.6%)	2.91	0.92
Environmental Impacts						
Soil Composition Alteration	67 (37.4%)	69 (38.5%)	20 (11.2%)	23 (12.8%)	3.00	1.00
Water Shortage	66 (36.9%)	78 (43.6%)	14 (7.8%)	21 (11.7%)	3.05	0.96
Loss of Pasture Lands	65 (36.3%)	69 (38.5%)	22 (12.3%)	23 (12.8%)	2.98	1.00

Scale: 0.5 to 1.4= Strongly Disagree, 1.5 to 2.4 = Disagree, 2.5 to 3.4 = Agree, 3.5 to 4 =

Strongly Agree

In Table 1 above, the responses, mean and standard deviation on socio-economic and environmental impacts of the current prolonged dry season on the study communities are presented. The data is presented independently for each parameter; social, economic and environmental in Table 1. However, it will be discussed as socio-economic and environmental impacts.

Socio-Economic Impacts

The mean of the data collected for the social impacts of the current prolonged dry season in the study communities was between 2.42 to 3.17. This indicated the respondents disagreed and agreed with the items within the parameter. The standard deviation varied between 0.77 to 1.10. This highlighted the responses being skewed and widely dispersed. Based on the data collected, majority of the respondents strongly agreed drug abuse (53.6%) was a social impact of the current prolonged dry season. Additionally, majority of the respondents agreed loss of employment (39.7%) was another social impact of the current prolonged dry season. Contrary, majority of the respondents disagreed breakdown in health condition (56.4%) was a social impact due to the current prolonged dry season.

The mean of the data collected for the economic impacts of the current prolonged dry season in the study communities was between 2.91 to 3.67. This showed the respondents agreed to strongly agreed with the items within the criterion. The standard deviation was between 0.66 to 0.95. The range of the standard deviation depict the responses were concentrated around the mean and widely dispersed. The data collected indicated majority of the respondents strongly agreed low yields/decrease in sales (76.5%) and economic loss (76%) were economic impacts of the current prolonged dry season. Moreover, majority of the respondents agreed increase in debts (45.3%) was an economic impact due to the current prolonged dry season.

Crop yields are significantly affected by the prolonged dry season. As a result, there is low yields for farmers and decrease in sales of business dependent on earnings from agricultural production. This contributes to economic loss which has dire impacts on the social welfare of the affected communities. Furthermore, the prospect of increased debts becomes more apparent given residents have suffered economic loss. As a result of economic loss, residents lack capital required to remain productive (Aslin & Russel, 2008). The study communities suffered from loss in employment and increase case of drug abuse. The decline in output results in the loss of employment within the affected community (Ziolkowska, 2016). Moreover, affected residents may resort to consuming drugs to cope with the change in social dynamics. In the study conducted by Aslin et al. (2008), there was an increase in alcohol consumption in communities affected by prolonged dry season. This has implications on the health and wellbeing of residents and family life in those communities.

Environmental Impacts

The mean of the data collected for the environmental impacts of the current prolonged dry season in the study communities was between 2.98 to 3.05. The range of the mean indicated respondents agreed with the items in the parameter. The standard deviation varied between 0.96 to 1.00. The range of the standard deviation highlighted the responses were widely distributed from the mean. Majority of the respondents agreed water shortage (43.6%), soil composition alteration (38.5%), and loss of pasture lands (38.5%) were environmental impacts of the current prolonged season in the study communities.

Prolonged dry season has implications on soil, water and vegetation (Vicente-Serrano, Quiring, Peña-Gallardo, Yuan, & Domínguez-Castro, 2019). These resources are integral for rural communities due to their high dependence on agricultural activities. In rural communities, the absence of permanent water sources results in severe challenges for residents during the prolonged dry season. The water sources that residents rely on are threatened where there is little or no rainfall (Mdletshe, Ndlela, Nsahlai, & Chimonyo, 2018). The livestock in these communities are reliant on pasture lands as source of food. The prolonged dry season causes wild grass fires destroying

pasture lands. As a result, livestock are without any food source resulting in starvation and losses. Additionally, soils in prolonged dry season suffer from a lack of organic material and too little water which results in limited downward chemical transportation and the accumulation of salts and carbonate minerals from upward moving water (Earle, 2019). This resulted in soil composition alteration in the study communities suffering from prolonged dry season.

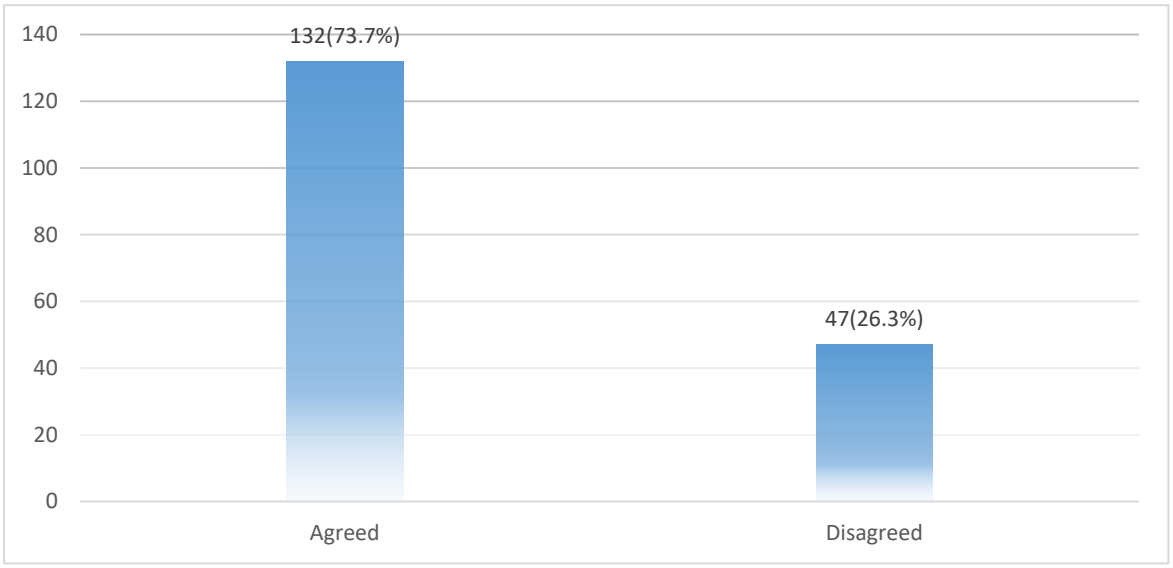

Figure 2. Number of respondents that experienced any constraints due to the current prolonged dry season

In Figure 2 above, the data revealed the number of respondents that experienced socio-economic and environmental constraints due to the current prolonged dry season. A total of one hundred and thirty-two (132) respondents (73.7%) agreed they had experienced constraints due to the current prolonged dry season. On the other hand, forty-seven (47) respondents (26.3%) disagreed they had experienced constraints due to the current prolonged dry season. The mean of 1.26 suggested the data is more aligned to respondents experiencing constraints in the study communities due to the current prolonged dry season. In addition, the modal value of one (1) further enhanced this representation of the dataset. More so, the standard deviation of 0.44 showed the data is not widely distributed but rather concentrated around the mean.

Table 2. Constraints of the socio-economic and environmental impacts of the current prolonged dry season within Lonsdale Village and Brothers Village, East Bank Berbice, Guyana

Faktors	Strongly Agree	Agree	Disagree	Strongly Disagree	Mean	Standard Deviation
Social Constraints						
Migration of Family Members for Employment	18 (10.1%)	47(26.3%)	84(46.9%)	30(16.8%)	2.30	0.86
Lack of Nutritious Meals	36(20.1%)	87(48.6%)	27(15.1%)	29(16.2%)	2.73	0.96
Breakdown in Family Life (School Drop-Out, Domestic Abuse)	61(34.1%)	72(40.2%)	23(12.8%	23(12.8%)	2.95	0.99
Economic Constraints						
High Operating Cost	28 (15.6%)	31 (17.3%)	81 (45.3%)	39 (21.8%)	2.27	0.97
Reduction of finances in the household	130(72.6%)	32(17.9%)	17 (9.5%)	-	3.63	0.65
Closure of Business	26(14.5%)	30(16.8%)	75(41.9%)	48(26.8%)	2.18	0.99
Environmental Constraints						
Barren Lands	56(31.3%)	69(38.5%)	37(20.7%)	17 (9.5%)	2.92	0.95
No Pasture for Livestock Grazing	117(65.4%)	40(22.3%)	18(10.1%)	4(2.2%)	3.50	0.77
Water Stress	42(23.5%)	116(64.8%)	21(11.7%)	-	3.11	0.58

Scale: 0.5 to 1.4= Strongly Disagree, 1.5 to 2.4 = Disagree, 2.5 to 3.4 = Agree, 3.5 to 4 = Strongly Agree

The respondents that have experienced constraints in the study communities due to the prolonged dry season were those residents that have direct reliance on the environment for productivity. Specifically, farmers and flow-on businesses that are reliant on the production from the communities. On the other hand, respondents that are employed by the public sector did not experience constraints due to the current prolonged dry season. As such, contributing to respondents disagreeing with experiencing any constraints due to the current prolonged dry season.

In Table 2 above, the responses, mean and standard deviation on constraints of the socio-economic and environmental impacts due to the current prolonged dry season on the study communities are presented. The data is presented independently for each parameter; social, economic and environmental in Table 2. However, it will be discussed as socio-economic and environmental constraints.

Socio-Economic Constraints

The mean of the data collected for the social constraints of the impacts of the current prolonged dry season in the study communities was between 2.30 to 2.95. This

indicated the respondents disagreed and agreed with the items within the parameter. The standard deviation varied between 0.86 to 0.99 This highlighted the responses were widely dispersed. Based on the data collected, majority of the respondents agreed lack of nutritious meals (48.6%) and breakdown in family life (40.2%) were social constraints due to the impacts of the current prolonged dry season in the study communities. On the other hand, majority of the respondents disagreed migration of family members for employment (46.9%) was a social constraint of the impacts from the current prolonged dry season.

The mean of the data collected for economic constraints of the impacts due to the current prolonged dry season in the study communities was between 2.18 to 3.63. This represented the respondents disagreed to strongly agreed with the items in the parameter. The range of the standard deviation was between 0.65 to 0.99. This highlighted the responses were skewed and widely distributed. Based on the data collected, majority of the respondents strongly agreed reduction of finances in household (72.6%) was the primary economic constraint due to the impacts of the current prolonged dry season. Contrary, majority of the respondents disagreed high operating cost (45.3%) and closure of business (41.9%) were economic constraints due to the impacts of the current prolonged dry season.

Many of the households in rural communities participate in subsistence farming to provide food for their households (Mbatha, Mnguni, & Mubecua, 2021). As a result of the environmental impacts on soil composition alteration, pasture lands and water shortage due to the current prolonged dry season, these households are at risk for food security and food availability (Small & Raizada, 2017). Therefore, creating a lack of nutritious meals among households. Additionally, the livelihoods of residents that are dependent on rain-fed agriculture and flow on businesses connected to the local economy of these communities are threatened by low yields and decrease in sales. As such, it resulted in reduction of finances in households and overall spending power of the community (Chen, Yan, & Yang, 2022). In order to cope with these challenges, drug abuse becomes prevalent. Men are more likely to consume alcohol due to the stress brought on by prolonged dry season (Aslin & Russel, 2008). There is a direct relationship between alcohol consumption and domestic abuse (Sontate, et al., 2021). Furthermore, to offset payments for increased debts brought on by the prolonged dry season, family members have to work to reduce operational cost (Aslin & Russel, 2008). This resulted in school drop-outs being prevalent in the study communities affected by the prolonged dry season. Collectively, these challenges contribute to the breakdown in family life disrupting a primary institution of the community.

Environmental Constraints

The mean of the data collected for environmental constraints due to the impacts due of the current prolonged dry season in the study communities was between 2.92 to

3.50. This represented the respondents agreed to strongly agreed with the items in the parameter. The range of the standard deviation was between 0.58 to 0.95. This highlighted the responses were skewed and widely distributed. The data collected showed majority of the respondents strongly agreed no pasture for livestock grazing (65.4%) was a constraint of the impact due to the current prolonged dry season. Additionally, majority of the respondents agreed water stress (64.8%) and barren lands (38.5%) were constraints derived from the impacts of the current prolonged dry season.

Prolonged dry season contributes to the reduction in fodder (Small & Raizada, 2017). Additionally, prolonged dry season reduces forage production (Akshit et al., 2020). Forage and fodder growth are severely affected by dry weather conditions contributing to lower quality of vegetation. Simultaneously, prolonged dry weather causes wild grass fires destroying limited forage and fodder. The loss of forage resulted in the loss of pasture for livestock grazing. The reduction in fodder generation further magnified the constraint affecting the diet and nutrition of livestock. This resulted in starvation leading to death and overall reduction in livestock. The effects of this constraint can be traced to social and economic repercussions for the study communities. Moreover, prolonged dry season changes soil composition through the loss of nutrients resulting in the net loss of fertility contributing to barren lands (Small & Raizada, 2017). Furthermore, water stress is synonymous when water shortage occurs. In the study communities, residents are connected to the national water system with a constant supply of water for residential use. However, agricultural activities are dependent on rainfall for water supply. This shortage of rainfall created water stress for agricultural activities. The effects of this constraint are linked to social and economic implications on the study communities

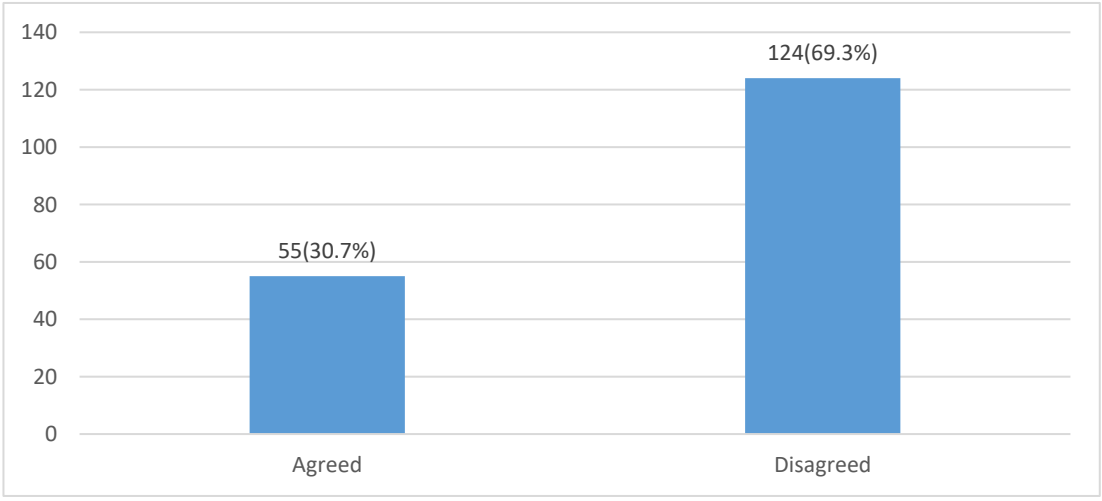

Figure 3. Number of respondents recorded for family members migrating from the study communities

In Figure 3 above, the total number of respondents recorded for family members migrating from the study communities is presented. Majority of the respondents (69.3%) disagreed with family members migrating from the study communities. Contrary, fifty-five respondents (30%) agreed with family members migrating from the study communities. The mean of 1.72 indicated the dataset is associated with majority of the respondents disagreeing with family members migrating from the study communities. The standard deviation of 0.46 resonates with the data being skewed towards the mean. In the study communities, migration is not of high concern given its low prevalence. However, it is noteworthy despite its low prevalence nevertheless, these communities lose valuable human resources. Therefore, it should be addressed before it is escalated towards the degree of being problematic for the study communities.

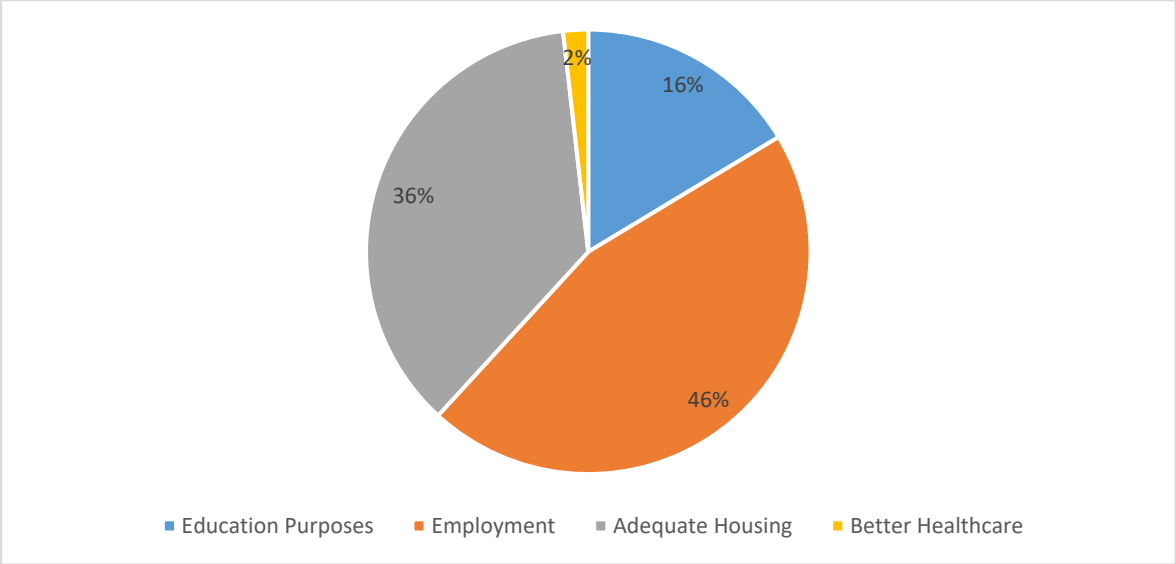

Figure 4. Responses recorded for primary reason for family members migrating from the study communities

In Figure 3 above, the primary reason for family members migrating from the study communities is presented. Majority of the respondents (46%) migrated for employment. Continuing, 36% of the respondents migrated for adequate housing whilst 16% of the respondents migrated for education purposes. Lastly, only 2% of the respondents migrated from the study communities for better healthcare. Based on the mean 2.23, it is more aligned towards the primary reason for family members migrating from the study communities for employment. The standard deviation of 0.74 represented the data spread being concentrated around the mean.

Majority of the respondents indicated family members migrated from the study communities primarily for employment. The current prolonged dry season has put a halt to production resulting in unemployment and financial challenges. As such, residents are coerced to migrate to different localities such as the capital city in search

of employment opportunities. These rural communities consist of living dynamics related to the extended family concept. This concept is deeply rooted in the need for labor to work on farms and assist in the cultivation of crops and livestock. However, many respondents indicated family members migrated for adequate housing. As families enlarge, the competition for space becomes apparent. As such, family members most likely migrate to nearby villages in close proximity to their family homes. This is to ensure they can actively provide labor to assist in the farming activities. Additionally, respondents indicated family members migrated from the study communities for education purposes. In order to gain academic qualifications and access better health facilities, residents in the study communities are required to migrate to central hubs to access these resources. As such, residents relocated to the capital city to access much required resources.

Table 3. Possible coping mechanisms to alleviate the socio-economic and environmental impacts of the current prolonged dry season within Lonsdale Village and Brothers Village, East Bank Berbice, Guyana

Factors	**Strongly Agree**	**Agree**	**Disagree**	**Strongly Disagree**	**Mean**	**Standard Deviation**
Social Coping Mechanisms						
Provision of Healthcare Services	18 (10.1%)	21 (11.7%)	89 (49.7%)	51(28.5%)	2.03	0.90
Provision of Counselling Services	53 (29.6%)	72 (40.2%)	35 (19.6%)	19 (10.6%)	2.88	0.95
Creation of Hot Meal Program	50 (27.9%)	81 (45.3%)	33 (18.4%)	15 (8.4%)	2.92	0.89
Economic Coping Mechanisms						
Diversification of Local Economy	127 (70.9%)	41 (22.9%)	7 (3.9%)	4 (2.2%)	3.62	0.67
Financial Support from Central Government	134 (74.9%)	19 (10.6%)	10 (5.6%)	16 (8.9%)	3.51	0.95
Environmental Coping Mechanisms						
Crop Rotation	52 (29.1%)	62 (34.6%)	46 (25.7%)	19(10.6%)	2.82	0.97
Water Storage	46 (25.7%)	68 (38%)	50 (27.9%)	15 (8.4%)	2.81	0.91

Scale: 0.5 to 1.4= Strongly Disagree, 1.5 to 2.4 = Disagree, 2.5 to 3.4 = Agree, 3.5 to 4 = Strongly Agree

In Table 3 above, the responses, mean and standard deviation of the socio-economic and environmental coping mechanisms of the constraints brought on by the impacts of the current prolonged dry season on the study communities are presented. The data is presented independently for each parameter; social, economic and environmental in Table 3. However, it will be discussed as socio-economic and environmental coping mechanisms.

Socio-Economic Coping Mechanisms

The mean of the data collected for social coping mechanisms for the constraints of the impacts due to the current prolonged dry season in the study communities was between 2.03 to 2.92. This represented the respondents disagreed and agreed with the items in the parameter. The range of the standard deviation was between 0.89 to 0.95. This highlighted the responses were widely distributed. The data collected showed majority of the respondents agreed creation of hot meal program (45.3%) and provision of counselling services (40.2%) were suitable social coping mechanisms for the social constraints brought on by the impacts of the current prolonged dry season in the study communities.

The mean of the data collected for economic coping mechanisms for the constraints of the impacts due to the current prolonged dry season in the study communities was between 3.51 to 3.62. This represented the respondents strongly agreed with the items in the parameter. The range of the standard deviation was between 0.67 to 0.95. This highlighted the responses were concentrated around the mean and widely distributed. The data collected showed majority of the respondents strongly agreed financial support from government (74.9%) and diversification of local economy (70.9%) were suitable economic coping mechanisms for the economic constraints brought on by the impacts of the current prolonged dry season in the study communities.

It is paramount to provide coping mechanisms that are tailored to the constraints brought on by the impacts of the prolonged dry season within the study communities. The provision of counselling services sought to address the breakdown in family life. It provides a medium for communication to address mental challenges brought on by the prolonged dry season. It provides an avenue for affected residents to share and overcome the mental constraints experienced due to the prolonged dry season. The creation of hot meal program will provide meals to ensure families can access a healthy diet and nutrition. It is necessary sustenance is provided when these communities face food security and food accessibility challenges. The diversification of the local economy reduces the reliance on agricultural production (Castellano-Álvarez, Robina-Ramírez, & Silva, 2024). The addition of various financial input into the local economy will promote safer economic climate. Rural communites can explore rural tourism as a facet to supplement the local econmy of their communties (Castellano-Álvarez, Robina-Ramírez, & Silva, 2024). This is ideal for the study communities creating additional sources of revenue for the local economy. More so, financial support from government is mandatory to provide capital to push towards diversification of rural economies. Additionally, central government plays an integral role in providing financial assistance to affected residents (Awuni, et al., 2023). The provision of monetary assistance reduces the financial burdens experienced by affected residents in the study communities.

Environmental Coping Mechanisms

The mean of the data collected for environmental coping mechanisms for the constraints due to the impacts of the current prolonged dry season in the study communities was between 2.66 to 2.82. This represented the respondents agreed with the items in the parameter. The range of the standard deviation was between 0.91 to 0.97. This highlighted the responses were widely distributed. The data collected showed majority of the respondents agreed water storage (38%), use of drought resistant seedlings (37.4%) and crop rotation (34.6%) were suitable environmental coping mechanisms for the environmental constraints brought on by the impacts of the current prolonged dry season in the study communities.

Water storage and conservation is necessary to reduce water stress in affected communities (Habib-ur-Rahman & Raza, 2022). In the study communities, rain-fed agricultural is dominant, hence storage of water through reservoirs and efficient use of water will reduce the challenge of water stress. The use of drought resistant seedlings and crop rotation can be applied when experiencing prolonged dry season to cope with environmental constraints. The use of drought resistant seedlings allows for growing specific crops during extreme dry periods maintaining productivity (Habib-ur-Rahman & Raza, 2022). This allows for the growth of fodder to supplement low forage. Likewise, crop rotation allows for the cultivation of crops that are suitable to the current prolonged dry season. As such, it reduces the implications of the prolonged dry season on production in the study communities.

CONCLUSION and RECCOMENDATIONS

The data of the research indicated the study communities; Lonsdale Village and Brother's Village, East Bank Berbice are affected by the current prolonged dry season. This study sought to explore the socio-economic and environmental impacts of the current prolonged dry season on Lonsdale Village and Brothers' Village, East Bank Berbice. The findings revealed the primary socio-economic impacts of the prolonged dry season on the study communties were: loss of employment, drug abuse, low yields, economic loss, and increased debts. The environmental impacts of the prolonged dry season on the study communties were: soil composition alteration, water shortage and loss of pasture lands. Majority of the respondents (73.7%) from the study communites indicated they experienced socio-economic and environmental constraints due to the impacts of the current prolonged dry season. The socio-economic constraints of the impacts on residents due to the prolonged dry season in the study communities were: lack of nutritious meals,breakdown in family life, and reduction of finances in household. The environmental constraints of the impacts on residents due to the prolonged dry season in the study communities were: barren lands, no pasture for livestock grazing, and water stress. The socio-economic coping

mechanisms to address the socio-economic contraints due to the impacts of the prolonged dry season on the study communities were: provision of counselling services, creation of hot meal program, diversification of local economy, and financial support from central government. The environmental coping mechanisms to address the environemntal constraints due to the impacts of the prolonged dry season on the study communities were: use of drought resistant seedlings, crop rotation and water storage.

Conflict of Interest

The authors have declared that there are no competing interests.

Authors Contribution

Each author made an equal contribution to study.

REFERENCES

Akshit S, Sheoran S, Harender SS, Kumar S, Paras SK., 2020. Impact of climate change on forage and pasture production and strategies for its mitigation -a review. Forage Research, 46(2): 105-113.

America Cyber Defense Agency., 2024. Prolonged Drought. Retrieved May 10, 2024, from www.cisa.gov/: https://www.cisa.gov/topics/critical-infrastructure-security-and-resilience/extreme-weather-and-climate-change/drought#:~:text=If%20a%20weather%20pattern%20that,long%2Dterm%20or%20prolonged%20drought.

Aslin H, Russel J., 2008. Social impacts of drought: review of Canberra: Commonwealth of Australia. Retrieved May 12, 2024.

Awuni S, Adarkwah F, Ofori D, Purwestri C, Bernal D, Hajek M., 2023. Managing the challenges of climate change mitigation and adaptation strategies in Ghana. Heliyon, 9 (5). doi:10.1016/j.heliyon.2023.e15491.

Bathiany S, Dakos,V. Scheffer MM, Lenton T., 2018. Climate models predict increasing temperature variability in poor countries. Science Advances, 4(5): eaar5809.

CARDI., 2023. Saint Vincent & the Grenadines. Retrieved from www.cardi.org: www.cardi.org/country-offices/st-vincent-the-grenadines/.

Carleton E., 2022. Climate change in Africa: What will it mean for agriculture and food security? Retrieved from www.ilri.org: www.ilri.org/news/climate-change-africa-what-will-it-mean-agriculture-and-food-security.

Castellano-Álvarez J, Robina-Ramírez R, Silva F., 2024. Rural Areas Facing the

Challenge of Economic Diversification: Threats and Opportunities. Rural Areas Facing the Challenge of Economic Diversification: Threats and Opportunities. Agriculture, 14(4): 623. doi:10.3390/agriculture14040623.

CDEMA., 2010. Drought threatening Guyana agriculture. Retrieved from https://www.cdema.org/news1: www.cdema.org/news1/445-drought-threatening-guyana-agriculture.

Centre for Climate and Energy Solutions., 2024. Drought and Climate. Retrieved May 09, 2024, from www.c2es.org: https://www.c2es.org/content/drought-and-climate change/#:~:text=How%20climate%20change%20contributes%20to,the%20timing%20of%20water%20availability.

Chen Z, Yan H,Yang C., 2022. A study on the impact of extreme weather on the poverty vulnerability of farming households—evidence from six counties in the hubei and yunnan provinces of china. Frontiers in Environmental Science, 10: 942857. doi:doi.org/10.3389/fenvs.2022.942857.

Core Environment Program., 2014. Climate Change and and Rural Communities in the Greater Mekong Sub Regions. Mandaluyong City: Asian Development Bank. Retrieved May 10, 2024, from https://www.adb.org/sites/default/files/publication/42089/climate-change-rural-communities-gms.pdf.

Earle S., 2019. (September 23). Weathering and the Formation of Soil. Retrieved May 28, 2024, from www.geo.libretexts.org: https://geo.libretexts.org/Bookshelves/Geology/Physical_Geology_(Earle)/05%3A_Weathering_and_Soil/5.04%3A_Weathering_and_the_Formation_of_Soil#:~:text=Too%20little%20water%20%28e.g.%2C%20in%20deserts%20and%20semi-deserts%29%2C,lack%20of%20organic%20materi.

European Commission., 2024. (February 20). Prolonged drought and record temperatures have critical impact in the Mediterranean. Retrieved May 13, 2024, from www.joint-research-centre.ec.europa.eu: https://joint-research-centre.ec.europa.eu/jrc-news-and-updates/prolonged-drought-and-record-temperatures-have-critical-impact-mediterranean-2024-02-20_en.

European Environment Agency., 2023. Climate change threatens future of farming in Europe. Retrieved from www.eea.europa.eu: www.eea.europa.eu/highlights/climate-change-threatens-future-o.

GALE., 2021. Global Warming Topic Overview. Retrieved from www.gale.com: www.gale.com/open-access/global-warming.

Guyana Bureau of Statistics., 2024. Monthly Amount of Rainfall for Coastal Regions, Guyana: 1981 to 2024. Retrieved May 13, 2024, from www.statisticsguyana.gov.gy: https://statisticsguyana.gov.gy/subjects/hydrometeorological/monthly-amount-of-

rainfall-for-coastal-regions-guyana-1981-to-2024/.

Habib-ur-Rahman M, Raza A., 2022. Impacts of climate change on agricultural production;Issues,challenges, and opportunities in Asia. Frontiers in Plant Science, 13: 925548. doi:10.3389/fpls.2022.925548.

International Rescue Committee., 2023. (July 13). What is drought? Causes, impact & countries most affected. Retrieved May 13, 2024, from www.rescue.org: https://www.rescue.org/article/what-drought-causes-impact-countries-most-affected.

Jamaica-Gleaner., 2023. (October 12). Guyanese urged to conserve water amid prolonged dry season. Retrieved May 13, 2024, from www.jamaica-gleaner.com: https://jamaica-gleaner.com/article/caribbean/20231012/guyanese-urged-conserve-water-amid-prolonged-dry-season.

Kheyruri Y, Sharafati A, Neshat A., 2023. The socioeconomic impact of severe droughts on agricultural lnds over different provinces of Iran. Agricultural Water Management 289(2023): 08550. doi:doi.org/10.1016/j.agwat.2023.10855.

Loop., 2023. (January 16). *Less rainfall in the Caribbean region as dry season continues.* Retrieved May 13, 2024, from www.caribbean.loopnews.com: https://caribbean.loopnews.com/content/less-rainfall-caribbean-region-dry-season-continues.

MacLeman A, Hunter M., 2010. Migration in the context of vulnerability and adaptation to climate change: insights from analogues. Wiley Interdisciplinary Reviews Climate Change, 1(3): 450-461. doi:10.1002/wcc.51.

Maryville University., 2022. (July 12). Why Is Agriculture Important? Benefits and Its Role. Retrieved May 12, 2024, from online.maryville.edu: https://online.maryville.edu/blog/why-is-agriculture-important/.

Mbatha W, Mnguni H, Mubecua A., 2021. Subsistence Farming as a Sustainable Livelihood Approach for Rural Communities in South Africa. African Journal of Development Studies, 11(3): 55. doi:10.31920/2634-3649/2021/v11n3a3.

Mdletshe M, Ndlela Z, Nsahlai V, Chimonyo M., 2018. Farmer perceptions on factors influencing water scarcity for goats in resource-limited communal farming environments. Tropical Animal and Health Production, 50: 1617-1623. doi:doi.org/10.1007/s11250-018-1603-x.

Mekonnen A, Tessema A, Ganewo Z, Haile A., 2021. Climate change impacts on household food security and farmers adaptation strategies. Journal of Agriculture and Food Research, 6: 100197.

Muzari W, Mutambara J., 2014. Climate Change Impacts And Response Options Among Rural Communities: Issues And Strategies. Chinhoyi,Zimbabwe: Asara Publishers. Retrieved May 10, 2024, from

https://www.researchgate.net/publication/366001843_Climate_Change_Impacts_And_Response_Options_Among_Rural_Communities_Issues_And_Strategies.

NASA., 2024. Global Precipitation Measurement. Retrieved May 11, 2024, from gpm.nasa.gov: https://gpm.nasa.gov/resources/faq/how-does-climate-change-affect-precipitation#:~:text=Current%20climate%20models%20indicate%20that,drying%20over%20some%20land%20areas.

New Castle University., 2023. Types of Sampling. Retrieved from https://www.ncl.ac.uk/: https://www.ncl.ac.uk/webtemplate/ask-assets/external/maths-resources/statistics/sampling/types-of-sampling.html

Newsroom., 2023. (November 20). Price hike: Prolonged dry season hitting farmers hard but gov't trying to cushion fallout. Retrieved May 13, 2024, from www.newsroom.gy: https://newsroom.gy/2023/11/20/price-hike-prolonged-dry-season-hitting-farmers-hard-but-govt-trying-to-cushion-fallout/

Quintana O, Reyes-Garcia V, Corbera E, Safa A, Solovyeva I, Xoplaki E, Subiras J., 2021. Socioeconomic Impacts of Climate Change in the Mediterranean. European Institute of the Mediterranean. Retrieved May 12, 2024

Seoraj N., 2016. (October 8). Guyana loses $4.8B to drought — during 2015-2016, Minister Holder reports. Retrieved from guyanachronicle.com: guyanachronicle.com/2016/10/08/guyana-loses-4-8b-to-drought-during-2015-2016-minister-holder-reports/.

Shrestha R, Rakhal B, Adhikari T, Ghimire G, Talchabhadel R, Tamang D, Sharma S., 2022. Farmers' Perception of Climate Change and Its Impacts on Agriculture. Hydrology, 9(12): 212. doi:doi.org/10.3390/hydrology9120212.

Small F, Raizada M., 2017. Mitigating dry season food insecurity in the subtropics by prospecting drought-tolerant, nitrogen-fixing weeds. Agriculture and Food Security, 6(1): 23. doi:10.1186/s40066-017-0096-6.

Sontate V, Kamaluddin R, Mohamed N, Mohamed P, Rashidi, Shaikh F, Kumar J., 2021. Alcohol, Aggression, and Violence: From Public Health to Neuroscience. Frontiers in Psychology. doi:10.3389/fpsyg.2021.699726.

Trading Economics., 2023. Guyana - Agriculture, Value Added (% Of GDP). Retrieved from tradingeconomics.com: tradingeconomics.com/guyana/agriculture-value-added-percent-of-gdp-wb-data.html.

UNDP Climate Change Adaptation., 2024. Guyana. Retrieved May 13, 2024, from www.adaptation-undp.org/: https://www.adaptation-undp.org/explore/latin-america-and-caribbean/guyana#:~:text=There%20are%20two%20wet%20and,Wet%20Season%20(November%20to%20January).

United Nation Environment Programme., 2022. (May 17). In Jamaica, farmers struggle to contend with a changing climate. Retrieved from www.unep.org: www.unep.org/news-and-stories/story/jamaica-farmers-struggle-contend-changing-climate.

Vicente-Serrano M, Quiring M, Peña-Gallardo M, Yuan S, Domínguez-Castro F., 2019. A review of environmental droughts: Increased risk under global. Earth Science Reviews, 201: 102953. doi:doi.org/10.1016/j.earscirev.2019.102953.

World Meteorological Organization., 2024. Drought. Retrieved May 13, 2024, from www.wmo.int: https://wmo.int/topics/drought.

Ziolkowska R., 2016. Socio-Economic Implications of Drought in the Agricultural Sector and the State Economy. Economies, 4(3): 19. doi:doi.org/10.3390/economies4030019.