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Research Paper

Socio-Economic Status of Population in Flood-Prone Areas of Two Grama Panchayath in Pathanamthitta District, Kerala

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***ABSTRACT**: Flood situation arises in India almost every year, and hence it is essential to prepare for a disaster in advance. Floods displace several people and cause heavy loss of life and property,leading to a large amount of poverty, agricultural deficiency, unemployment, and even starvation. The economy also gets affected due to damage of crops direct or indirect affecting the agriculture sector. The country needs a better emergency and effective flood mitigation system to ensure the safety of its people and economy. Floods generally refer to water accumulation in places that are usually submerged. Heavy rainfall is the leading cause of inland flooding. Another hand, natural hazards that cause inland flooding are melting snow, glacial outbursts, and dam-break flows. Flood in rivers valley region is a disaster which can destroy the entire environmental set up of the area. It causes riverbank erosion, depression of the land, shifting of the river course, river channel widening etc., due to its high discharge, elevation, volume, andThe increase in the frequency of floods has generally been caused to climatic change.Pathanamthitta district is an important area that isordinarily vulnerable to floods. The study's main objectives are to carry out a socioeconomic status in flood-prone regions of Kaloopara and Aranmula in Pathanamthitta district and discuss the social and economic aspects of flood in the flood-affected sites. The people affected consequences and their management. Pathanamthitta is one of the most flood-prone districts in Kerala caused by the overflow of the rivers The Pamba, The Achankovil riverand Manimala River and their tributaries. Due to the surge of rivers, some parts of the district receive floods every year. Kaloopara and Aranmula Grama Panchayath are the most flood-prone areas under KozhencherryThiruvalla thaluk of Pathanamthitta district. The present study is based on both primary and secondary data and tries to establish the relationships among the different variables used for the analysis.*

***KEYWORDS**: Floods, Impact, Socio-Economic Status, Causes, Management*

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I. INTRODUCTION

Flood is one of the most critical disasters which can destroy the entire physical and socioeconomic, environmental set-up of the area and occur almost in all parts of the world. Flood may have occurred seasonally in the same portion of the world and sometimes suddenly happen due to physical phenomena and human factors. According to Carter, "floods have the following characteristics (1991): Long, short and no warning, depending on the type of floods (for example, flooding within parts of a major river may develop over some days or even weeks,), speed or onset may be gradual or sudden, and there may be seasonal patterns of flooding". It causes by heavy rainfall, cloud burst, riverbank erosion and siltation of river bed, depression of the land, shifting of the river course, river channel widening etc., due to its high discharge of water, variation of elevation, volume and longer duration.

It createsa large number of poverties, agricultural deficiency, extensive damage to infrastructure, unemployment, psychological issues,starvation, death and others. It is essential to remember that the severity of flood disasters is not solely linked to the intensity of the natural hazard but also too many human-driven factors that lead to increasing the risk for flooding and magnifying the impacts, such as construction activities, soil degradation, deforestation, overgrazing, faulty agricultural practices, urbanization, and poor urban drainage.

Urbanization is the process that reduces the potential for lands to correctly absorb heavy precipitation and hence strongly contributes to the risk of flooding.

This may also force the people into unsafe and flood-prone areas, notably impoverished people in rural to urban migration. Examples include the dangerous peripheral regions of Manila, Kolkata, Dhaka, or Rio de Janeiro, where the poorest settle down in urban slums in highly disaster-prone (and especially flood-prone) areas, on unstable slopes or in flood-prone basins. Over the last 30 years, l 3,119 floods occurred worldwide, resulting in the deaths of more than 2,00,000 people and affecting more than 2.8 billion others, according to EM-DAT. Floods are the most common of natural hazards in the state. Nearly 14.5% of the state's land area is prone to floods, and the proportion is as high as 50% for certain districts. Landslides are a significanthazard along the Western Ghats in Wayanad, Kozhikode, Idukki, and Kottayam districts. Seasonal drought-like conditions are also common during the summer months. Kerala experienced 66 drought years between 1881 and 2000. Dry rivers and lowering water tables in summer have led to water scarcity in urban and rural areas. Other significant natural hazards are lightning, forest fires, soil piping, coastal erosion, and high wind speed.

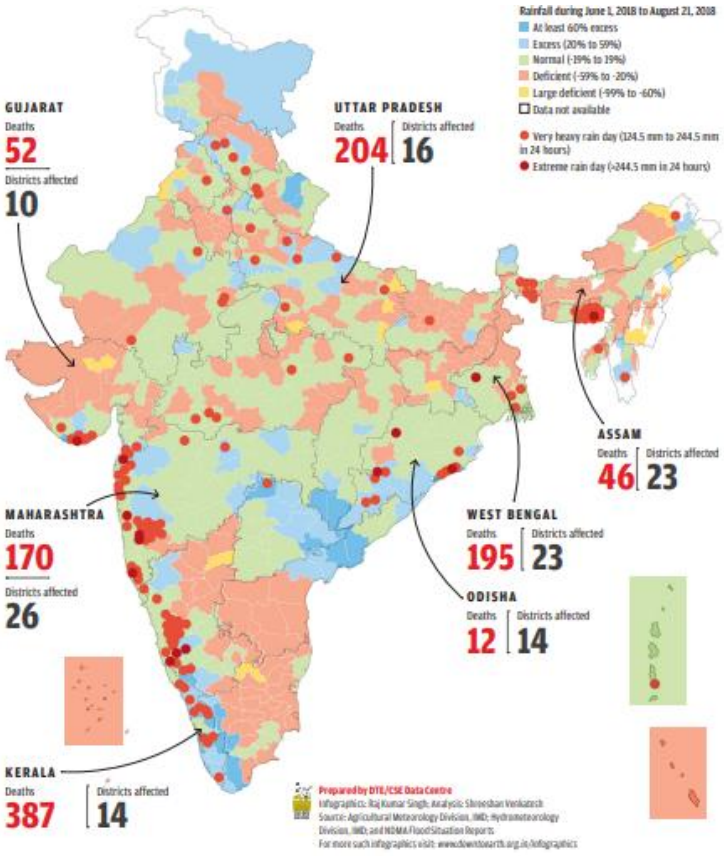


Figure 1: Flood prone area in India

Kerala Cood (2018) was the worst one experienced by the state since 1924 (Vishnu et al. 2019). Kerala is located in the southwestern part of India, with the Arabian Sea to the west and the Western Ghats to the east (Vishnu et al. 2019). The state has mainly three physiographic features with highland, midland, and coastal plain varying from 75 to\7 m (Vishnu et al. 2019). The plateau and midland are used for agricultural activities, and commercial plantation coastal plains are densely populated (Sudheer et al. 2019). The state has an average annual precipitation of about 3000 mm, controlled by the southwest and northeast monsoons (Joseph et al. 2020). During 2018, pre-monsoon rainfall had an unprecedented 37% in precipitation. The monsoon depression (13–17 August) that immediately followed a low-pressure monsoon system (6–9 August) resulted in many days of heavy rainfall (Hunt and Menon 2020). Kerala experienced above-normal seasonal rainfall with extreme rain from 1st to 15th in the upstream catchment of Idukki, Kakki and Periyar, having a return period of more than 500 yrs, resulting in most reservoirs reaching 90% capacity (Mishra et al. 2018).The departure from average was 15% in June, 18% in July and 164% in August (August 1–19, 2018) (IMD 2018). Out of 54 dams, 35 were opened, and according to the Government of Kerala, nearly 1/6th of the population were seriously affected, and Rs 20,000 crore is the estimated loss incurred by the state (Varghese and Yadukrishnan 2019). The heavy rainfall resulted in landslides in the Western Ghats, causing damage to property and agriculture (Vijith and Madhu 2008)

II. LITERATURE REVIEWS

Nott (2006) studied that a flood event is not considered a natural hazard unless there is a threat to human life and property. The extent of a flood directly relates to the recovery times of crops, pastures, and the social and economic dislocation impact on populations. Floods are the most costly and wide-reaching of all-natural hazards. They are responsible for up to 50,000 deaths and adversely affect some 75 million people worldwide every year. Disease outbreak is typical, especially in less developed countries. Malaria and Typhoid outbreaks after floods in tropical countries are also standard. It has been estimated that 300 million people live in areas affected by floods in India and Bangladesh. Know Risk (2005) observed that the economic impact of natural disasters shows a marked upward trend over the last several decades.

The hazards tend to hit communities in developing countries, especially the least developed countries, increasing their vulnerability and setting back their economic and social growth, sometimes by decades. The floods have led to a loss of human life, social and economic infrastructure destruction, and the degradation of already fragile ecosystems.

Dixit (2003) pointed out that vulnerability is the condition of a person or group in terms of their capacity to anticipate, cope with, resist and recover from the impact of a natural hazard. Even in standard times, people live in vulnerable conditions. Vulnerable conditions and families find it hardest to reconstruct their livelihood following a disaster. Ninno et al. (2003) revealed that the 1998 floods in Bangladesh caused severe damage to the rice crop and threatened the food security of tens of millions of households. Government food transfers to the affected people helped limit the impact of the flood on household access to food. The deluge led to significant crop losses, losses of other assets and lower employment opportunities and thus affected household income as well as market prices.

Gao. et al. (2007) states that although water shortages often grab the headlines, floods continue to be China's most serious natural disaster. This is despite enormous efforts to construct structural engineering projects for flood control. According to the Office for the Coordination of Humanitarian Affairs (OCHA 2008), the cumulative number of people affected by rains and floods in 2007 in Southern Africa was more than 194,103 persons. This included 60,995 in Malawi (significant damage to property and crops), 94,760 people in Mozambique (all were evacuated into resettlement camps); more than 16,680 in Zambia (1,890 persons in temporary accommodation, the rest in host families); and 15,168 in Zimbabwe. An estimated 4,000 people had been affected in Lesotho and another 2,500 persons in Swaziland. In 2008, thousands of people were affected after flash floods submerged hundreds of hectares of farmland in the north-eastern region after floods displaced hundreds of families.

The farmland which supported some 1,200 farmland had their livelihoods and food security disrupted (IRIN 2008). Theron (2007) indicated that at least 20 countries in Africa were affected by floods. These countries included Algeria, Berlin, Burkina Faso, Cote d'Ivoire, Ethiopia, Gambia, Ghana, Guinea, Kenya, Liberia, Mali, Mauritania, Nigeria, Rwanda, Senegal, Sierra Leon, Sudan, Togo and Uganda. Reports estimated that approximately 300 people in 20 countries had died in floods during two (2) months, noting that the inaccessibility of the affected areas had made it difficult to access the death toll accurately. Floods had several socioeconomic and political implications, which caused a wide range of complex issues. Some of the immediate consequences included the displacement of people, the destruction of infrastructures such as houses and roads, damage to farms and crops and loss of cattle and livestock. The destruction of roads and other infrastructure delayed ongoing development initiatives and political processes.

Khandlhela and May (2006) argued that while disasters may affect everyone and play an essential role in increasing vulnerability, poor people are made more vulnerable from a web of circumstances that make them prone to disasters. In this study, they also observed that the varying impact of floods on households and the community showed that vulnerability to the effects of a flood disaster is indeed an outcome of the interaction between socio, economic and political processes. From the literature reviewed, it's clear that the increasing population of our planet earth leads to the expanding exposure of people and property to hazards of flooding. This assertion is in line with the research findings, which has confirmed that the population of people living along the river banks in the study area has increased over the years and has made them susceptible to flooding. With the increased population on the earth's surface, it may be expected that the effects of climate change will further aggravate this. There are not adequate measures globally to limit the growing chance and consequence of flooding.

The evidence is that flood risk increases, and continuing vigilance is needed to ensure that existing systems are maintained and improvements introduced. Human society must adopt a risk management approach if there is a harmonious coexistence with floods. In practical terms, the chance of flooding can never be eliminated. Further, most flood studies acknowledge that floods have harmed people. However, the studies have tended to address the subject matter depending on the study's objective.

III. OBJECTIVES OF THE STUDY

• To analyze the socioeconomic status of the flood-prone areas of Kaloopara and Aranmula Grama Panchayath in Pathanamthitta district.
• To traces out the problems of the study areas.
• Try to find out the possible measures for minimizing the problems.

IV. DATABASE AND METHODOLOGY

The present study is based on 171 households drawn from the four flood-prone villages of Kaloopara and Aranmula Grama Panchayath Pathanamthitta district Kerala. Most of the information was collectedfrom the villages where floods occurred almost every year. The relevant data were collected through a primary survey by visiting the households with a suitable questionnaire. The opportunities given by meeting the homes in person provides a great scope for an in-depth investigation. Two Gram Panchayat have been taken from the study areas based onthe frequency of flood occurrence in the Kaloopara and Aranmula Grama Panchayath in the Pathanamthitta district. These Grama Panchayaths have been selected randomly. Out of them, 171 households have been randomly taken from the total households in the Grama Panchayaths (Table 1).

All the data were converted into relative numbers such as percentage and ratio methods used for observed the overall situation of the villages.

V. THE STUDY AREA

Kaloopara and Aranmula Grama Panchayathare located in the northern part ofthe Pathanamthitta district. The Pathanamthitta district dominates the area has very fertile soil, rich in all plant nutrients. The soil can be classified as Kari, Alluvial and Laterite. Geologically the soil found in Chengannur Rolling Plain is acidic saline. It includes Kari, Kayal and karappadam soils. In the north-eastern portion of this region, shallow black, brown and alluvial soils of the southern region are found. Kuttanad Low-Lying Plain has a recent formation of the soil of acidic saline. It is developed under hydromorphic conditions. These include the Kari soil (black soil with high organic content produced in the low-lying water-logged area), Kayal soil (soil in reclaimed areas with high clay content) and karappadam soil (soil along with river courses with silt content). Technically, the soil is classified as psamments-orthents (Figure 3,LULC Information of Pattanamtitta).

The climatic condition of the district has more or less the same climatic conditions as prevalent elsewhere in the state, viz. dry season from December to February and the hot season from March to May. This region is at an altitude ranging from 500 to 1000 metres above sea level. The climate is generally moderate, with temperatures ranging from 20°C to 39°C. The southwest monsoon known as Edavappathi from June to September and the north-west monsoon known as Thulavarsham or retreating monsoon from October to November provide pretty good rain. The southwest monsoon is usually very heavy, and about 75 per cent of the annual rainfall is received during this season.Populations of the study area are engaged in the agriculture sector.

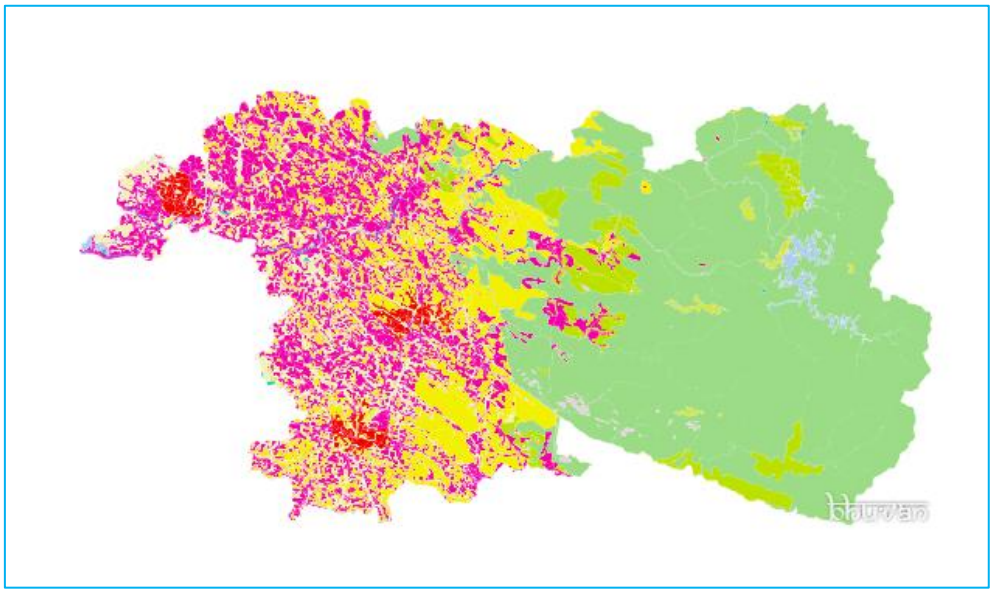


Figure 2 :LULC of Pathanamthitta District

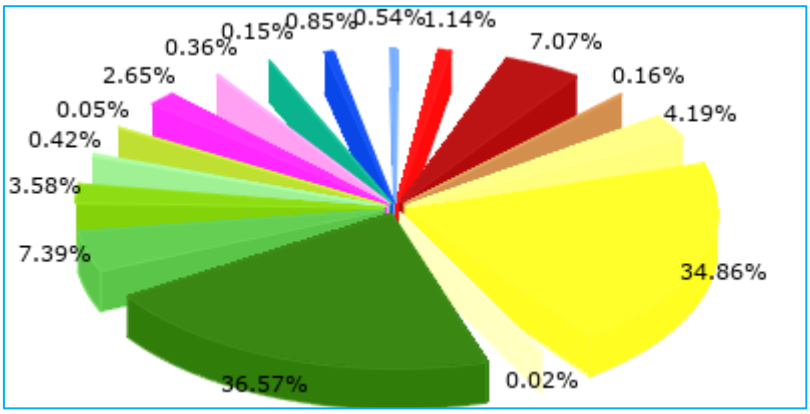
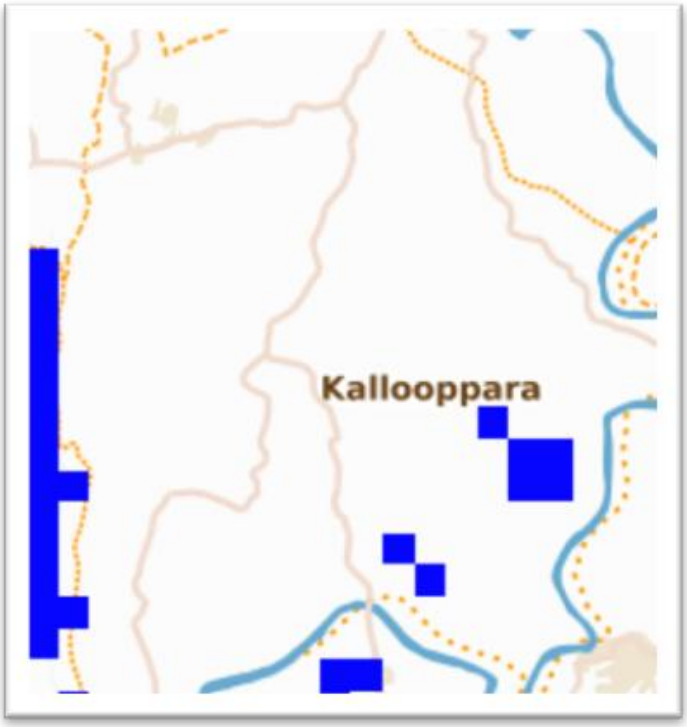


Figure 3 : LULC Information of Pattanamtitta

LULC class		Area (Sq.Km)	LULC Class		Area (Sq.Km)
1	Builtup,Urban	30.08	1	Builtup, Rural	186.83
2	Builtup, Mining	4.19	2	Agriculture, Cropland	110.78
3	Agriculture, Plantation	921.05	3	Agriculture, Fallow	0.61
4	Forest, Evergreen/ Semi evergreen	966.26	4	Forest, Deciduous	195.16
5	Forest, Forest Plantation	94.47	5	Forest, Scrub Forest	11
6	Grass/Grazing	1.42	6	Barren/unculturable/ Wastelands, Scrub land	70.02
7	Barren/unculturable/ Wastelands, Barren rocky	9.39	7	Wetlands/Water Bodies, Inland Wetland	3.99
8	Wetlands/Water Bodies, River/Stream/canals	22.39	8	Wetlands/Water Bodies, Reservoir/Lakes/Ponds	14.36

Table 1 :LULC Information of Pattanamtitta
Source : NRSC.Bhuvan



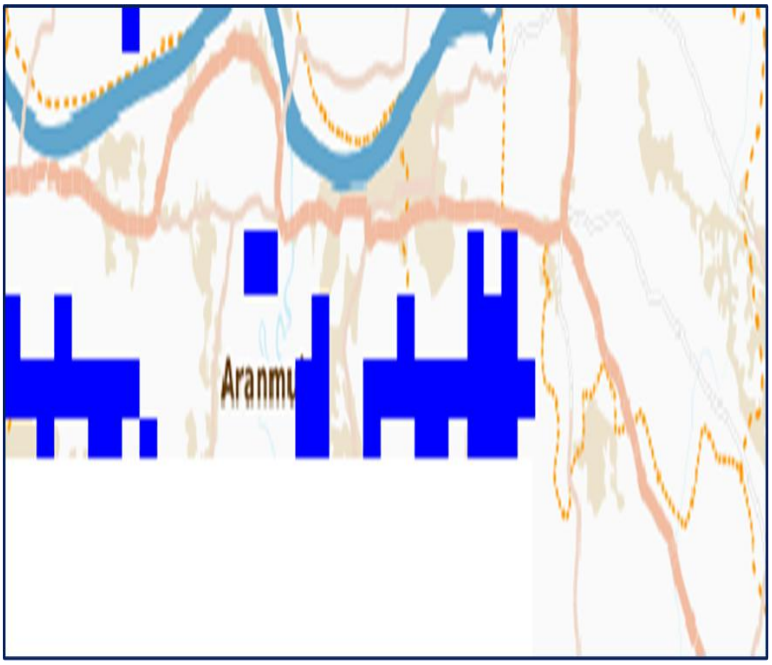


Figure 4 :Flood Prone Areas Of Aranmula And Kaloopara

VI. DISCUSSIONS

6.1Family Size

The average family size in India in 1961 was 5.1; it increased to 5.6 in 1981 (Chakravorty and Singh, 1991) and dropped to 5.4 in 1998-99, which is 1.4 times higher than the family size of China in 1995. In China, the average family size in 1995 was 3.7 members per household (Zeng, 2002). The mean family household size in urban areas in India is 5.16, and a rural area is 5.47 members per household. The rural-urban differential in the mean family size is quite visible in the data indicating higher fertility in rural areas. Barring a few states, an almost similar picture is evident in rural-urban differences in all the states of India.

Further, the distribution of family size by type of family reveals a mean length of 7.93 in the urban areas and 8.16 in the rural areas among joint families, and 3.35 and 3.24 respectively among broken nuclear families. The nuclear family households have a mean family household size of 4.39 in urban areas and 4.54 members in rural areas. According to the primary survey, the average length of family members is 6.30.The survey shows that 33.33 percentage households have more than eight members in the family, and 48.54 per cent of households have members between 5 and 8. In contrast, only 18.13 percentage families have less than five members in the family (Table 2). The size of the family member is the critical determinant to measure the socioeconomic status conditions of areas.

Size of the family	*Per centage*
Small family (>5 members)	18.13
Medium (5-8 member)	48.54
Large (<8 members)	33.33
total	100

Table 2:Percentage distribution of households in Aranmula and Kaloopara Grama Panchayth

Source: field survey

6.2Housing Condition

Housing condition is another factor that reflects the socioeconomic condition of people. According to a preliminary study, nearly 78 per cent of households are pucca houses (fifty percent houses are constructed with the support of the government),followed by 13.45 per cent of households are semi-pucca, and only7.6 per cent households are kutcha houses in the study area (Table 2). It means the housing condition of the population in the study area is very bad. Educational Status Education is one of the most critical indicators for socio-economic development, and education also improves the societies' occupational structure. The level of education is determined by the level of occupation and income level. Table 4 reveals that illiteracy among the household heads is very high inthe Aranmula grama panchayath. Nearly 32.63 per cent household heads of the total households are educated up to primary level, followed by middle (18.95 per cent), high school pass (12.63 per cent), 10+2 (9.47 per cent), graduate (18.95 per cent), and Post Graduate and other (7.37 per cent).

Size of the familyEducational Level	*Percentage of Sample Household*
Uneducated	45.40
educated	54.76
total	100
Primary	33.73
Middle	18.95
High School	12.63
10+2	9.67
Graduate	18.75
Post Graduate and others	7.58
Total	100

Table 4: distribution of households' heads based on education level in in Aranmula and Kaloopara Grama Panchayth

Source: field survey

6.3 Occupational Structure

The unemployment rate in the Aranmula-Kaloopara grama panchayath is relatively high compared to the district average. Nearly 99.6 per cent of women in Aranmula-Kaloopara grama panchayath are a housewife. The percentage of primary workers in Aranmula-Kaloopara grama panchayath is comparatively higher than in the other parts of the district. The occupational structure of the study area reflected a clear picture, where farming is the main occupation for maintaining their basic needs. According to a primary survey, nearly 45.03 per cent of sample households solely depend on farming, followed by 13.45 per cent enjoying service in government and private sectors. The third-largest occupation in the study areas is daily labourers, which is more than 12.28 per cent of the total head of the sample households, and 11.7 per cent of households some time partially and some timeentirely depend on business . An agricultural labourer is one of the lowest-paid activities in India, which is very high (9.36 per cent) compared to any part in the district, and 8.19 per cent households depend on other activities over the year.

6.4**Land Ownership**

Land ownership and landholding size are the essential socioeconomic determinants for rural societies. Size of landholding reduces the level of poverty and provides self-employment opportunities. According to the primary survey, more than 43.27 per cent of households have no agricultural land; only they have their land for housing. In the case of India, there is 31.12 per cent of households have notown cultivated land, whereas, in Kerala, the corresponding figure is 34.69 per cent (Economic & Political Weekly). Only 56.73 per cent of households have their land. Among them, most families havethe minimal and marginal size of landholding, which is not sufficient for maintaining their livelihood(Table5).

Category	*Percentage*
Landless	43.27
<5 cent	25.15
6-10 cent	9.94
16-20 cent	12.28
Anove 25 cent	4.09
Total	100

Table 5 :Land Ownership Status Of Househol's Head In Aranmula And Kaloopara Panchayath

Source: field survey

6.5 Level of Income

The socioeconomic factors determining the sources of earnings and spending patterns associated with the nature of the economic activities play a vital role in explaining the low level of income causing poverty. Usually, the poor with a low level of education and other assets, more mouth to feed, traditional lifestyle, and families values are risk-averse. This means those who cross certain age are rigid in terms of not trying out any new opportunities open to them until and unless they are fully convinced about the outcomes of the new ventures. Because they live in the same environment of poor achievement and fatalistic attitude, they are also slow to adopt any changes. The empirical evidence also suggests that the incidence of poverty is very sensitive to the magnitude andthe method of estimating the poverty income line. Table 6 depicts that more than 42.69 per cent of households have less than rupees 3000 per capita household income per month, presently which is very low and caused by the common socioeconomic condition of the areas. The second-largest income group of

household heads earns only rupees 3000-6000 per capita household income per month which is 31.58 per cent household heads of the total number of households. Only 9.94 per cent of household heads have income between rupees 7000-10000, followed by 7.6 per cent from rupees 11000-14000, 4.68 per cent in between rupees 15000-18000 and only 3.51 per cent above rupees of 18000.

per capita household income	*Percentage*
<3000	42.69
3000-6000	31.58
7000-10,000	9.94
11,000-14,000	7.8
15,000-18,000	4.68
>18,000	3.41
total	100

Table 6:Distribution of household Heads based on per capita household income In Aranmula And Kaloopara Panchayath
Source: field survey

6.6 **Health Status**

Health care facilities are also one of the essential factors that reflect the population's socioeconomic status. In the study area, all the patients are categorized into two types (a) regular condition patients & (b) severe condition patients. According to the primary survey, only 21.64 per cent of average condition households' patients checked up their health to the registered doctors. The remaining 78.36 per cent depends on non-registered doctors due to their lack of socioeconomic condition and not availability of registered doctors doctor in the villages. On the other hand, many households go to registered doctors when their patients' condition issevere or critical. According to a study, more than 58 per cent of families depend on registered doctors, and the remaining 41.52 per cent rely on non-registered doctors.

VII. CONCLUSIONS AND SUGGESTIONS

The study revealed that the average size of family members in the study area is 6.30. Maximum (48.54 per cent) household of the study areas having 5 to 8 members in the family. Nearly 78 per cent of households are Pucca, 13.45 per cent are semi-pucca, and only7.6 per cent of households are pucca in the study area. In the study area, only 55.56 per cent of the population are literate, and a majority (32.63 per cent) are educated up to the primary level. The principal occupation of the study area is farming (45.03 per cent) and agriculture labourers (9.36 per cent). Only 56.73 per cent of households have their land; among them, most of the homes haveminimal and marginal landholding, which is not sufficient for maintaining their livelihood. Nearly 43 per cent of households have less than rupees 3000 per capita household income per month. Only a few per cent of the households' heads have more than rupees 18000 per capita household incomes per month. The Gram Panchayat, Kaloopara and Aranmula is the highest number of households depending on non-registered doctors in typical cases due to their lack of transport facilities. It is also clear from the above analyses that floods harm the socioeconomic status of livelihoods for households in Kaloopara and AranmulaPathanamthitta district of Kerala. The above discussion has further demonstrated that floods in one sector can affect other sectors of society. The most crucial issue of water contamination of the river at the pick of floods and handling water from the borehole increases the health risk. No health facility was damaged due to floods; problems are created in health services accessibility due to damaged infrastructure (roads and bridges).

In the case of the school-going population, attendance was disrupted due to damaged transport and communication facilities. From the discussion, it is evident that households in the sample area face various types of problems due to floods. However, the consequences of flooding can be mitigated by appropriate behaviours and actions. Successful flood risk management depends on the active support of all on whom the effects of flooding may impact, those directly at risk, the civil authorities and the wider community and its leaders. Socially vulnerable or disadvantaged households have lower levels of disaster preparedness. Flood risk is expected to increase substantially in the coming years due to both climate change and continued socioeconomic development.

SUGGESTIONS

• There should be a deliberate policy to compel communities, especially in rural areas, to build houses using durable materials and away from flood-prone areas. • The relevant authorities should delineate flood-affected areas, and temporary shelter should be timely provided to the fold affected people. • Construction of dams should be considered to trap the excess water. This could also be used for irrigation purposes. • Construction of canals into the main ManimalyarRiver should be considered. • Government and key stakeholders should be

engaged the communities and local authorities in making them aware of flood risk because of the climate variability. • In the long term, a community-based flood early warning system should be developed. • Multi-sectoral approach to flood mitigation, as opposed to the single sector, should be promoted as there are interlinkages in flood impact on various aspects of society. • Active participation of the people to minimize losses, e.g. construction of advance flood shelters for people and cattle & properties. • Storage sufficient food, drinking water and other essential goods before floods. • The government and NGOs should quickly take rescue and relief operations. • To prevent damage to the dams and unauthorized construction in the flood plain, side slope of embankment etc. • To assist and co-operate on the maintenance of existing dams by local people • People must follow the existing rules and regulations for prevention and mitigation of floods.

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