



THE SAGA OF FLOOD WATERS IN KUTTANAD- A CASE STUDY OF KAINAKARY

Dr. Sheeba. V.T., Asst. Professor,
PG & Research Dept. of Economics, N S S Hindu College,
Changanacherry, Kottayam, Kerala.

Abstract

Kuttanad is a region famous for its heritage of below-sea-level farming. The region has been a boon to the State of Kerala in its endeavour to attain self-sufficiency in paddy production. Although world-famous for its heritage farming, it has constantly been facing the brunt of frequent floods and climate disasters. Agriculture in Kuttanad has become a risky operation, and the lives of common people have become increasingly difficult due to the vagaries of floods. This is also substantiated by the decline in area under paddy lands in the region. The floods are continuously hampering the lives of common people and have led to the loss of assets and livelihood in the region. This study is an attempt to analyse the impact of floods on Kainakary, which is one of the worst-hit areas of Kuttanad.

INTRODUCTION

Kuttanad, known as the rice bowl of Kerala, with its paddy fields, small streams and canals with lush green coconut palms, was well known even from the early periods of the Sangam age. History says Alappuzha had trade relations with Greece and Rome in the Middle Ages [Dick Whittacker, 2009]. According to legend Kuttanad was once a forested area, which later got destroyed by a forest fire, thus giving it the name Chuttanad; it is said to have become Kuttanad. History reckons Kuttanad as a region, which was under the reign of Chera dynasty that ruled over Ancient Kerala. And one of the famous kings in the dynasty, Cheran Chenguttavan, is said to have ruled his vast kingdom from Kuttanad. Beginning in the 1880s, the state not only allowed but actively encouraged and assisted the reclamation of backwaters for growing rice. Thus was born the rice-bowl of Kuttanad. While rice from Kuttanad did not enter the world market, it greatly facilitated the participation of the Travancore economy in the world market. Together with cassava and imported rice, rice produced in Kuttanad helped to keep the price of foodstuff in Travancore under control. With rice-fields themselves created by draining the backwaters, rice-cultivation in Kuttanad was truly miraculous [Rammohan.K.T, 2006]. The Kuttanad backwaters were vast and deep; they had strong winds and sea-like tides. Reclamation in such conditions was an arduous task and fraught with the risk of failure. From the late 19th century, with the reclamation of deeper backwaters and the emergence of new Kuttanad, the composition of the landlord class changed. Professionals like lawyers and teachers located in small towns on the fringes of the backwaters invested in reclamation and became owners of vast rice-growing tracts. [Rammohan.K.T., 2006]

The entire Kuttanad region is broadly classified into lower, upper and north Kuttanad. Some of the well-known villages that form Kuttanad, Kainakary, Ramankary, Chennamkary, Nedumudy, Kumarakom, Edathua, Kavalam, Pulikunnu, Kidangara, Muttar, Karichal, Cheruthana, Karuvatta, Mankompu and Thayankary. Four of Kerala's major rivers, the Pampa, Meenachil, Achankovil and Manimala flow into the region. It is well known for its boat race in the Punnamada backwaters, known as Vallamkali.

Kuttanad is a region covering the Alappuzha, Kottayam and Pathanamthitta districts, well known for its vast paddy fields and geographical peculiarities. The region has the lowest altitude in India and is one of the few places in the world where farming is carried on around 1.2 to 3.0 meters (4 to 10 feet) below sea level. The region is historically important in the ancient history of South India and is the major rice producer in the state. Farmers of Kuttanad are famous in biosaline farming. Food and Agriculture Organisation (FAO) has declared the Kuttanad farming system as a Globally Important Agricultural Heritage System (GIAHS).

History reveals that the Great Flood of 1924 occurred when the Periyar River in Kerala flooded in the month of July 1924. As the Malayalam calendar was popular in Kerala, the flood is generally referred to as "The Great Flood of 1999". Kerala received unprecedented rains in July 1924. The state received 64 percentage higher than normal rainfall, [3451.3 mm], which is the highest recorded rainfall. The economic losses that happened worldwide due to natural disasters between 1998 and 2017 are valued at US\$ 2908 billion of which 77 per cent are due to climate-related disasters (UNISDR [2018]). Since 2018, Kuttanad has been witnessing frequent floods with high devastation potential. Even when other parts of Kerala are not experiencing flooding and waterlogging, flooding is happening in Kuttanad. 35 out of the 54 dams within the state were opened for the first time in history in 2018.

As per the primary analysis by the state Agriculture Department, around 56,844.44 ha of cropped area has been affected by the floods, causing a loss of Rs 1355.68 crore to 3.14 lakh farmers Govt. Of Kerala, 2018]. Among the major crops, paddy and banana were the worst hit by the flood, with 26,106 and 6,348 ha of crop damaged in the flood, respectively. Agricultural loss in Alappuzha District was estimated to be Rs. 35,15,00,000 [GOK, Dept. of Soil Survey and Soil Conservation 2018] and 606 houses in the district were reported to be damaged. Studies have found that relative to the households in the bordering states, income for households in Kerala decreased by 16 per cent (cumulative) in June and August-2018 but was quick to rebound. Household expenditure on the other hand, decreased by 7 per cent (cumulative) during the same period, but the decline persisted for a longer period. We also find that the key mechanism for recovery of household finance post the floods was through borrowings from different sources, especially from banks [Indian Statistical Institute-2019]. The severe erosion and the deposition of sediments have affected the soil quality of Kerala in terms of its physical, chemical and biological properties. Topsoil erosion caused by rains and overflowing of dams and deposition of silt/sand in the lowlands also brought about changes in the physical and chemical properties of soil. Floods are devastating when it impacts daily life of inhabitants. Water storage capacity in ponds, lakes and other water reservoirs has deteriorated due to silt deposition. The purpose of the review is to study flood-related problems in Kuttanad.

OBJECTIVES

- To study the impact of floods in Kuttanad with special reference to Kainakary, a region in Kuttanad and assess the losses to property and livelihood.
- To identify the level of rehabilitation and assistance provided by the state.

METHODOLOGY

A survey with the help of a structured questionnaire was used to collect primary data from Kainakary. A total of 50 respondents, randomly selected, constituted the sample. The questionnaire method, Informal interview method and Random sampling method were used to collect primary data.

LIMITATIONS OF THE STUDY

- Non-availability of proper statistical data.
- The study is conducted within a short period of time.

LITERATURE SURVEY

VIJU. B [2019]

In his book Flood and Fury, the author states that the floods that devastated large parts of Kerala in 2018 were not an isolated, freak phenomenon; rather, they signalled something graver-the ecological devastation of the Western Ghats. Made a UNESCO World Heritage Site in 2012, the Ghats have become increasingly vulnerable to serious ecological damage, threatening the sustenance of their people. The 2018 floods were a wake-up call for the region spanning 1600 kilometres and six states-Kerala, Tamil Nadu, Karnataka, Goa, Maharashtra and Gujarat-that form an ecosystem older than the Himalayas. large-scale mining, quarrying, deforestation and mismanagement of water resources were the real reason for the floods. Any instability in the uplands was translated in to disasters in the lowlands like Kuttanad. The author has mapped its culture, history and ecology, investigating the crisis in the Western Ghats and suggesting policy measures urgently required to mitigate it.

Francis George [2018]

In 2018, severe floods affected the south Indian state of Kerala, due to unusually high rainfall during the monsoon season. It was the worst flooding in Kerala in nearly a century. Over 483 people died, and 15 are missing. At least a million people were evacuated, mainly from Chengannur, Pandanad, Edanad, Aranmula, Kozhencherry, Ayiroor, Ranni, Pandalam, Kuttanad, Aluva, and Chalakudy, N. Paravur, Chendamangalam, Eloor and few places in Vypin Island. All 14 districts of the state were placed on red alert. According to the Kerala government, one-sixth of the total population of Kerala had been directly affected by the floods and related incidents. The Indian Government had declared it a Level 3 Calamity, or "calamity of a severe nature". It is the worst flood in Kerala after the great flood that happened in 1924. Thirty-five out of the fifty-four dams within the state were opened for the first time in history.

Murali Thummarakuti&Peter Benoy [2019] The study unravels the ecological vulnerabilities of the state and provides insights into the way human interventions have increased these vulnerabilities. The discussions and findings underline that the state needs to be better equipped for a changing climate. The need for integrated water resources management, better land use planning and risk-informed building codes is also highlighted. The lessons learned from the disasters and the response reveal that irrespective of the group, all the vulnerable populations substantially lag and do not enjoy the human development that the state celebrates. In addition to that, these populations were severely impacted by the floods and landslides and their historical marginalisation has been further augmented and complicated.

KAINAKARY -PROFILE

Kainakary is a small village situated at a distance of about 8 km from the town of Alappuzha, the headquarters of the Alappuzha district. The village is 20 km from Changanacherry town by road. According to the 2011 state census, the population of Kainakary was 23696, living in 5689 households [<https://www.census2011.co.in/data/village/628236-kainakary-north-kerala.html>] The total area is governed as two separate villages namely Kainakary north and Kainakary South. Kainakary South is a large village located in Kuttanad Taluka of Alappuzha district, Kerala with total 3770 families residing. The Kainakary South village has population of 15405 of which 7364 are males while 8041 [Census2011]. Average Sex Ratio of Kainakary South village is 1092 which is higher than Kerala state average of 1084. Kainakary South village has higher literacy rate compared to Kerala. In 2011, literacy rate of Kainakary

South village was 97.64 % compared to 94.00 % of Kerala. In Kainakary South Male literacy stands at 98.42 % while female literacy rate was 96.93 %.

Kainakary North is a large village located in Kuttanad Taluka of Alappuzha district, Kerala with total 1919 families. The Kainakary North village has population of 8292 of which 4081 are males while 4211 are females as per Population Census 2011.

In Kainakary North village population of children with age 0-6 is 893 which makes up 10.77 % of total population of village. The average sex ratio of Kainakary North village is 1032 which is lower than Kerala state average of 1084. Child Sex Ratio for the Kainakary North as per census is 1002, higher than Kerala average of 964. Kainakary North village has higher literacy rate compared to Kerala. In 2011, literacy rate of Kainakary North village was 97.82 % compared to 94.00 % of Kerala. In Kainakary North Male literacy stands at 98.62 % while female literacy rate was 97.05 %. Kerala's worst disaster in 2018 august devastated Alappuzha district. Kainakary was one of the areas most affected by the 2018 floods. The whole area was submerged, and people were shifted to temporary camps. The villagers were forced to leave to safety due to heavy flooding, damaging their homes, killing livestock, etc. The government announced a draft of flood relief and mitigation projects to uplift the Kuttanad region. The state cabinet authorised the chief secretary to prepare a package of short-term and long-term projects for the recovery.

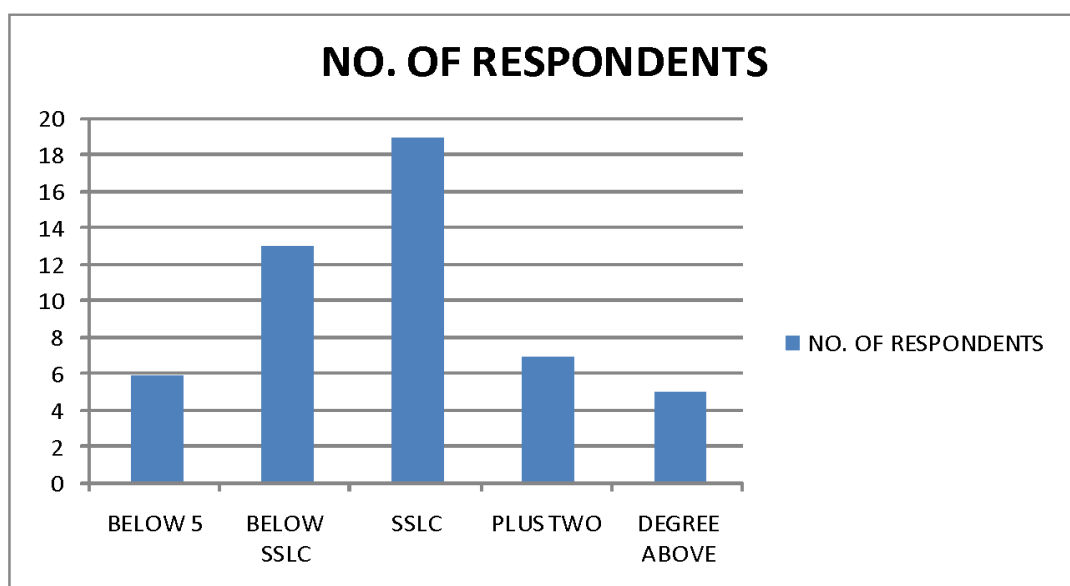
A study of Kainakary was done using a sample of 50 respondents selected randomly from Kainakary. A structured questionnaire was used to elicit information from the respondents. A primary survey was conducted using a direct personal interview.

Table 1

EDUCATIONAL QUALIFICATION OF THE RESPONDENTS

The table shows the educational qualification of the respondents from Kainakary Panchayath.

Sl. NO.	CLASS	NO. OF RESPONDENTS	PERCENTAGE
1	Below 5	6	12%
2	Below SSLC	13	26%
3	SSLC	19	38%
4	Plus two	7	14%
5	Degree above	5	10%
	Total	50	100%



Source: Primary Survey.

The table shows the educational qualifications of the respondents. There are 5 categories of educational qualifications shown in the table. They are below five, below SSLC, SSLC, plus two, degree, and above. The highest percentage (38%) of respondents have SSLC qualification. The lowest percentage (10%) of the respondents has the qualification up to Degree and above. It clarifies that 90 per cent of the respondents have no higher educational qualifications. These details are graphically represented in the above diagram.

OCCUPATIONAL DETAILS OF THE RESPONDENTS

The table shows occupational details of the respondents from Kainakary Panchayat.

Table.2

OCCUPATIONAL DETAILS

SI.NO.	OCCUPATION	NO. OF RESPONDENTS	PERCENTAGE
1	Agriculture	27	54%
2	Other services(accountant, govt. employee, business, teacher, plumber, nurse, doctor, barber, cashier, carpenter).	23	46%
	Total	50	100%

Source: Primary Survey.

INCOME STATUS OF THE RESPONDENTS

This table shows the income status of the respondents from the Kainakary Panchayat.

Table 3

INCOME STATUS

SI NO.	INCOME LEVEL/MEASURE	NO. OF RESPONDENTS	PERCENTAGE
1	Below 10000	27(Agriculture sector)	54%
2	Above 10000	23(Other services)	46%
	Total	50	100%

Source: Primary Survey.

The above table shows that those with agriculture as the main occupation [54%] have an income less than 10000 and those engaged in other professions have an income above 10000. It reveals the low-income-yielding nature of Agriculture.

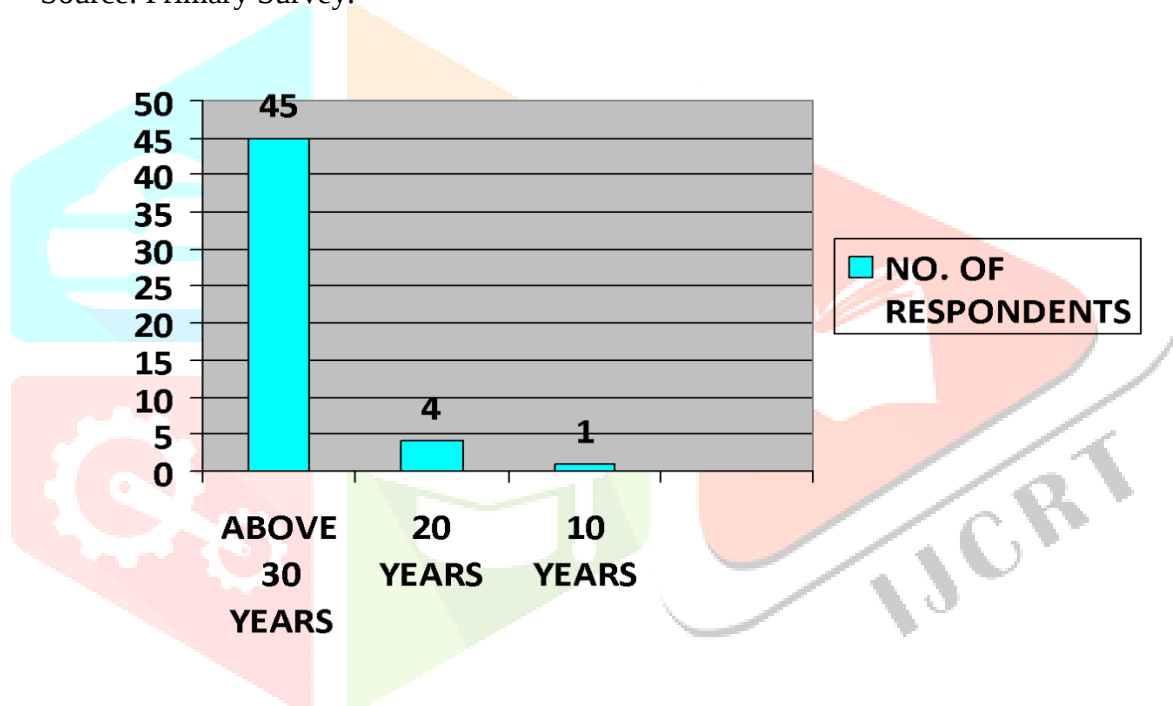
RESIDENT STATUS OF THE RESPONDENTS

This table shows the resident status of the Respondents from the Kainakary panchayath. Residential status means the number of years respondents have been staying in Kainakary panchayath.

Table 4**RESIDENT STATUS**

SI. No.	NO. OF YEARS	NO. OF RESPONDENTS	PERCENTAGE
1	Above 30 Years	45	90%
2	Above 20 years	4	8%
3	Above 10 years	1	2%
	Total	50	100%

Source: Primary Survey.



The table shows the resident status of the respondents. There are three categories of resident status shown in the table. They are above 30years, 20 years and 10 years. The highest percentage (90%) of the respondents have lived in Kainakary for more than 30 years. The lowest percentage (2%) of the respondents were settled for more than 10 years. These details are graphically represented in the above diagram

DETAILS OF THE MAJOR HOUSEHOLD ITEMS LOST DUE TO FLOOD

This table shows the details of the major household items lost due to flood in Kainakarypanchayat.

Table.5**DETAILS OF THE MAJOR HOUSEHOLD ITEMS LOST DUE TO FLOOD**

SL. NO.	ITEMS
1	T.V
2	Motor
3	Furniture
4	Fridge
5	Mixy
6	Washing machine
7	Cylinder

Source: Primary Survey.

The table shows the details of the major household items lost due to the flood. T.V, Motor, Furniture, fridge, mixer, Washing Machine, and cylinder are the major household items lost in the flood. The respondents' daily life was affected due to the loss of household durable items.

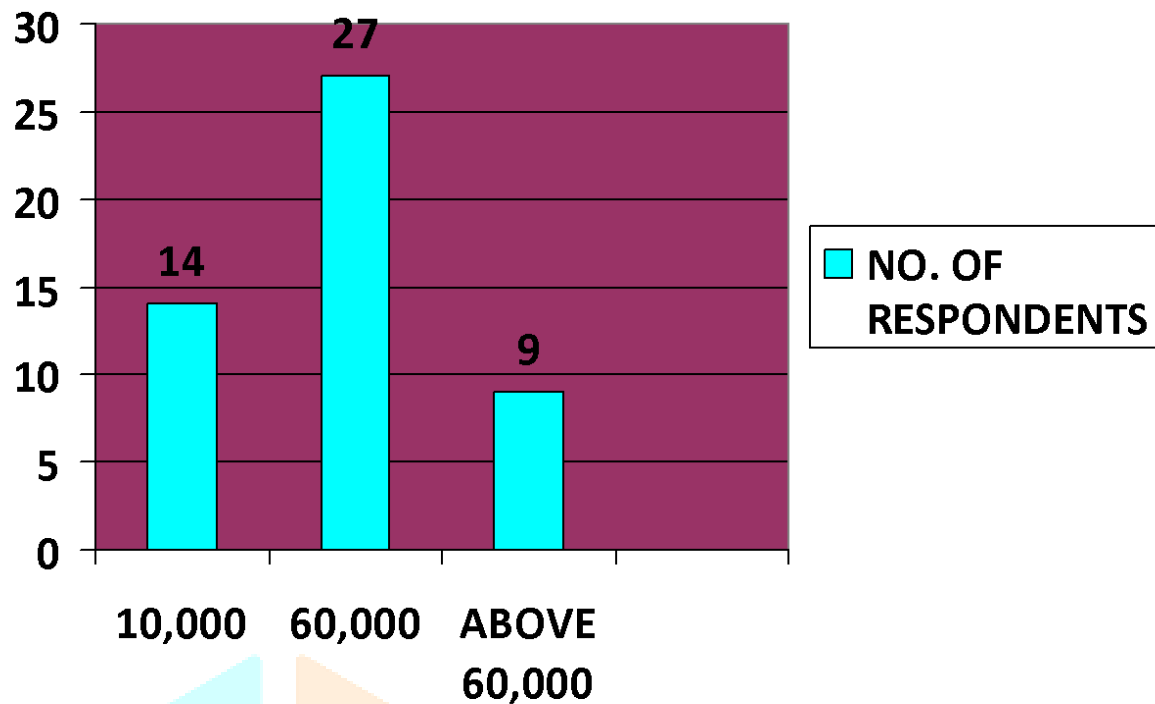
GOVERNMENT ASSISTANCE TO THE RESPONDENTS

This table shows the benefits from the government to the respondents in Kainakary Panchayath. The assistance varied depending on the extent of damage to houses, property, cattle and crops. The relief per hectare for agriculture was approximately Rs.13,500. [https://sdma.kerala.gov.in/wp-content/uploads/2026/03/Flood-advertisement-2018. pdf]

Table.6**GOVERNMENT ASSISTANCE**

SL.NO:	Government assistance	No. of respondents	Percentage
1	10,000	14	28%
2	60,000	27	54%
3	Above 60,000	9	18%
	TOTAL	50	100%

Source: Primary Survey.



The table shows the benefits from Government to the respondents. There are 3 categories of assistance from Government as shown in the table. They are 10,000, 60,000 and above 60,000. The highest percentage (54%) of the respondents have received 60000 as relief from the government. The variations in relief are due to the variations in loss of crops and household property. Though relief was provided to the people affected by Flood, daily life was affected according to the respondents.

LOSSES DUE TO FLOOD TO THE RESPONDENTS

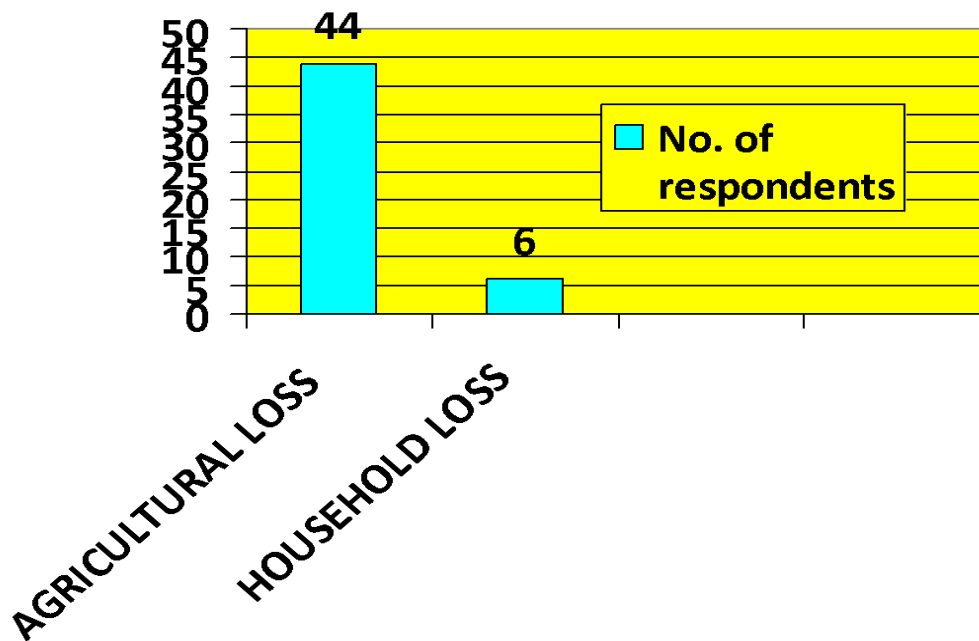
This table shows the losses due to the flood of the respondents in Kainakary Panchayath.

Table.7

LOSSES DUE TO FLOOD

SL.NO:	LOSSES DUE TO THE FLOOD	NO. OF RESPONDENTS	PERCENTAGE
1	Agricultural loss / financial loss (loss on crops mainly)	44	88%
2	Household loss (loss on household property mainly)	6	12%
	TOTAL	50	100%

Source: Primary Survey.



The table shows the losses due to floods among the respondents. There are 2 categories of losses due to flood shown in the table. They are Agriculture loss and Household property loss. The highest percentage (88%) of the respondents have experienced agricultural loss due to floods. The least percentage (12%) of the respondents have experienced loss of household property.

SUGGESTIONS.

The study of primary and secondary sources highlights the need for a proper and appropriate flood relief policy which includes the following.

1. Improve the efficiency of the Thottappally Spillway System.
2. Set up more flood barriers.
3. Construct buildings above the flood levels.
4. Improve the soil conditions.
5. Use small barriers in ditches and fields, which help to divert the water into open land and also restore the small canals and tributaries which smoothen the flow of floodwaters.
6. Introduce better flood warning systems.
7. Introduce proper water drainage systems.
8. Tackle climate change.

CONCLUSION

For Kuttanad, known as Kerala's rice bowl for its rampant paddy cultivation, flooding was a part of life. Even before 2018, when the state witnessed one of the biggest floods in a century, floods would occur every year during the monsoon month of July. In 2018, floods too; people were shifted to relief camps. Kuttanad has a fragile and closed coastal ecosystem. There have been disastrous effects on its ecosystem due to the climate changes. The flooding of rivers, climate induced sea level rise etc; has played havoc on its nature. It is therefore important that flood risk assessments incorporate an understanding of the impacts of flood

hazard. Based on the present study the conclusion may be drawn that occurrence of continuous flood cause many Problems. The destructive effects included development problems, changes in the pattern of production affecting the life of the people, loss of their jobs, agriculture, household equipment, etc. The flood disaster increased the duties of state and local governments and is a burden on the state treasury.

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