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# Impact Assessment of Kerala Flood 2018 on Agriculture of Farmers in Edathua Panchayat, Kuttanad Taluk of Alappuzha District

**S.L.Santhi**
*College of Co-operation, Banking and Management*
*Kerala Agricultural University, Thrissur, Kerala India*

**G.Veerakumaran**
*Professor, Department of Co-operative Management,*
*College of Co-operation, Banking and Management*
*Kerala Agricultural University, Thrissur, Kerala, India*

**Abstract**
*The people of Kerala have suffered the worst natural calamity, deluge from 15th august 2018, and this continued for a week. Due to the heavy rainfall, which was more than 164%, the usual rain resulted in filling dams to maximum capacity made all barriers opened and caused over flooding. A humble attempt was made to conduct an "Impact assessment of Kerala flood 2018 on agriculture of farmers in Edathua Panchayat, Kuttanad Taluk of Alappuzha district. 45 flood-affected farmers were examined with a pre-structured interview schedule. The impact of the flood had distorted the life of farmers; the unexpected wave had washed away their cultivations. The surge has not only affected the fields but also their homes, live stocks, aquaculture, agriculture implements, assets, and so on. During the flood, the government has provided urgent aid and relief material promptly and without any restrictions. The major problems faced by farmers are the inadequacy of assistance, reduction in yield and lack of pure water, delay in getting support, repayment of the loan, and so on. The government should help these farmers to overcome these conditions; otherwise, they will suffer colossal debt, which would be a reason for them to leave this sector.*
**Keywords: Flood, Agriculture, Livestock, Production, Sale**

## Introduction

Kerala is the state on the southwestern part of India, spread over 38,863 sq.km, formed on 1 November 1956 with 14 districts. There are 44 rivers in Kerala, which are judiciously used by the people, which have a significant impact on the livelihood of the population, which includes agriculture, fisheries, poultry, livestock, and small scale industries. It is the 12th largest economy in India with 11.3% GDP contribution in Agriculture (Centre for Development Studies, 2017). The people of Kerala have suffered the worst natural calamity, deluge from 15th august 2018, and this continued for a week. Due to the heavy rainfall, which was more than 164%, the usual rain resulted in filling dams to maximum capacity made all barriers opened and caused over flooding. Over 483 died, and 1/6th of the total population was affected. A total of 57,000 hectares of agriculture crops have been destroyed. Kuttanad is the area rich in backwaters, which was hugely influenced by the flood. Edathua is one among the Grama Panchayat in Kuttanad, and it's entirely affected by the flood.

## Statement of Problem

Kuttanad, the 'Rice Bowl of Kerala,' lies in Alappuzha district is the only place in the world where cultivation is done up to 2 meters below sea level which is unique and known as The Kuttanad Below Sea-level Farming System (KBSFS). Farmers of Kuttanad were practicing the fantastic technique of below sea level cultivation of rice and integrated farming over 150 years. It's the area rich in backwaters, which was hugely affected by the flood. Edathua is one among the Grama Panchayat in Kuttanad, and it was uniquely influenced by the wave. Agriculture and allied sectors faced massive loss. Hence, a humble attempt was made to conduct an "Impact assessment of Kerala flood 2018 on agriculture of farmers in Edathua Panchayat, Kuttanad Taluk of Alappuzha district.

## Objectives

The objectives of the study are:

- To examine the impact of a flood on the Agricultural sector in Edathua Panchayat.
- To assess the impact of a flood on livestock of affected farmers.
- To assess the financial and technical assistance needed for the reconstruction of farms and other income sources.
- To suggest measures to rebuild the farming sector in the selected area.

## Methodology

Both primary and unimportant data were manipulated for this study. The primary data was achieved through a pre-structured Interview schedule, and secondary data were raised from Panchayat, Krishibhavan, and Reports on a flood. The study was restricted to the farmers in Edathua Panchayat of Alappuzha district. The sample consists of 45 affected farmers, and they have selected a simple random sampling. The data gathering was carried out during December 2019. The tools used for the analysis of the data were Percentage analysis, Paired T-test, and Index method.

## Profile of the Study Area

Edathua Panchayat is established in Kuttanad, Alappuzha District of Kerala. The Panchayat was established in the year 1953. Agriculture is the main occupation of this village, and it is well known for its vast paddy fields. The entire area of this Panchayat is 2229 hectares, and of which, 2000 hectares of land is suitable for agriculture. One thousand six hundred twenty hectares of land is used for paddy cultivation by farmers. Paddy, plantain, coconut, vegetables, etc. are the major cultivated crop in this Panchayat. In smaller quantity tuber crops and cash, plants are cultivated. The Agriculture practices and preparations for doing cultivation is entirely different in Mathura. It all starts with Dewatering, i.e., the water in fields and farms are pumped out. The significant varieties of rice include Uma, Jaya, and Jyothi, which are salinity tolerant varieties. The main plantain varieties cultivated are Nendran, Palayankodan, Njaalippoovan, and Chenkadhali. Every farmer usually has Kitchen-garden. And some of the farmers are having Fish farming, fatting of animals, maintenance of milch animals and bird rearing, etc. The unique ecological environment of the entire Kuttanad region supports a wide variety of agrobiodiversity and wild biodiversity.

## Results and Discussions

Based on the objectives framed, the authors presented the results in brief.

## Profile of the selected Respondents

The study was carried out from 45 Respondents of Edathua Grama Panchayat. Most of the respondents were male and are coming under the age group of above 50. Mostly they have completed SSLC education, and their primary source of income is agriculture.

## The Impact of flood on Edathua Grama Panchayat

The impact of the flood had distorted the life of farmers; the unexpected wave had washed away their cultivations. The surge has not only affected the fields but also their homes, live stocks, aquaculture, agriculture implements, assets, and so on.

**Table 1: Value of Agriculture Produces Before and after a Flood**

| Livestock Produce | Quantity Produced (liters, no.) | | Sales (Rs. in lakhs) | |
|---|---|---|---|---|
| | Before flood (2016-17) | After flood (2017-18) | Before flood (2016-17) | Before flood (2016-17) |
| Cow | 4650 | 3720 | 1.684 | 1.34 |
| Goat | 495 | 330 | 0.2475 | 0.17 |
| Hen (eggs) | 5232 | 0 | 0.31392 | 0 |
| Duck (eggs) | 456 | 0 | 0.0456 | 0 |
| Fish | 4700 | 0 | 25 | 0 |

**Source:** Primary data

The tables 1 indicate the details of the value of sale before and after a flood for the selected 45 respondents in the respective years (2016-17 before the flood, 2017-18 after a wave). Before the flood the sales of paddy was Rs.147.94 lakhs and in the case of vegetables it was Rs.39000 and pepper at Rs.21000. In the case of plantain, it was Rs.37.92 lakhs before flood and Rs. 1.84 lakhs in case tapioca. After the flood the production was nil, and hence there is no sale. They used to sell out their produces immediately after harvest due to lack of storage facilities. It was noticed that the farmers take very little from the entire production for consumption. Only in the case of vegetables, the whole creation is taken up for eating, and if there is any left out, sold in the local market. In this region, SUPPLY CO (Civil Supply Corporation of Government of Kerala) procure paddy from the farmers at the rate Rs.23.50 per kilogram. Other agricultural products are sold in the local markets. Farmers get an average Rs.450 – Rs.500 for a bunch of banana. Tapioca fetches Rs.25-Rs.30 per kilogram; pepper was sold at the rate of Rs.300/- per kilogram, and coconut bring Rs. 20 per nut. However, vegetables, pepper, and coconut are cultivated mainly for household consumption. Test of significance was calculated, and results are stated below:

**$H_0$:** Production before a flood is equal to production after a flood

**$H_1$:** Production before a wave is not similar to production after a flood

For the paired t-test, calculated at 5% significance is 1.89, which is higher than the table value. So the null hypothesis is rejected, and an alternative explanation is accepted.

**Flood Impact on Sales and Productivity of Livestock Produce**

Allied sector mainly includes livestock, poultry, fisheries, etc. and are a significant source of income to farmers. Every farmer has at least hen, cow, or goat at their home. Their livelihood was supported by all these.

**Table 2 Flood Impact on Production and Sale of Livestock Produce**

| Livestock Produce | Quantity Produced (liters, no:) | | Sales (Rs. in lakhs) | |
|---|---|---|---|---|
| | Before flood (2016-17) | After flood (2017-18) | Before flood (2016-17) | After flood (2017-18) |
| Cow | 4650 | 3720 | 1.684 | 1.34 |
| Goat | 495 | 330 | 0.2475 | 0.17 |
| Hen (eggs) | 5232 | 0 | 0.31392 | 0 |
| Duck (eggs) | 456 | 0 | 0.0456 | 0 |
| Fish | 4700 | 0 | 25 | 0 |

**Source:** Primary Data

Table 2 clearly states the production and sales details of allied sectors per month in the several years of all 45 respondents. Flood has a significant impact on allied sectors also. In the case of livestock for their better lactation, the excellent climatic condition is required. But during a flood, the animal has suffered

a lot of stress, lack of adequate feed, which resulted in the reduction of its yield. Before the flood, a cow produced 10 liters of milk per day. Before the flood, the cows altogether produced 4650 liters of milk in a month, and after the flood, it was reduced to 3720 liters. In the case of goats, they produced 495 liters before the flood, and after the flood, it was reduced to 330 liters. Before the flood, the poultry together produced near 5500 eggs. The entire chicken died during a wave. And a huge loss was incurred to the farmers. Rs.85050 loss was incurred in case of hen, and Rs.9200 was the loss incurred in the case of ducks. Test of significance was calculated, and results are stated below:

**$H_0$:** Production and Sales before a flood is equal to production after a flood

**$H_1$:** Production and Sales before surge is not similar to production after a flood

For the paired t-test, calculated at 5% significance is 1.89, which is higher than the table value. So the null hypothesis is rejected, and an alternative explanation is accepted.

## Technical and Financial Assistance Received by Farmers

During the flood, the government has provided urgent aid and relief material promptly and without any restrictions. The National Crisis Management Committee has monitored and co-ordinated the rescue and relief operations. Financial Mechanism to meet the loss incurred during the flood was carried out by the State Disaster Response Fund (SDRF).

**Table 3 Technical and Financial assistance Received by farmers**

| Assistance (amount) | No. of respondents | % of total |
|---|---|---|
| SDRF (Rs.10000/- per family) | 45 | 100 |
| Paddy loss Assistance (Rs.5400/- per acre) | 40 | 88.8 |

**Source:** Primary Data

Government of Kerala has given an amount of Rs.10000/- per family from the state distress relief fund to all affected people. And for paddy fields, Rs.5400/- per acre was given as assistance. Krishibhavan (Agricultural Office) and Panchayat (Local Self Governments) have arranged relief camps, seminars, and classes to farmers for providing proper knowledge and skill to rebuild their assets after a flood. Table 3 indicates that the entire affected people got SDRF assistance, and 88.8 % got Paddy assistance loss.

## Measures to Rebuild the Farming Sector in the Selected Area

In Edathua Panchayat, a flood washed away crops, hen, cow or goat and other assets, etc., of the farmers. It is necessary to identify the constraints and remedies to overcome those constraints. The major problems faced by farmers are the inadequacy of assistance, reduction in yield and lack of pure water, delay in getting support, repayment of the loan, and so on. The following table depicts their problems and recommendations for rebuilding their livelihood.

**Table 4 Constraints of Flood-Affected Farmers and Recommendations**

| S. No. | Constraints | Recommendations |
|---|---|---|
| 1 | Inadequacy of assistance | • Adequate assistance must be given for crop loss in agriculture or allied sector<br>• Assistance must be given for repairing houses too |
| 2 | Reduction in yield | • Technical Assistance must be given for reduction in crop yield<br>• Planting material of high yielding varieties of crops must be provided |
| 3 | Delay in getting assistance | • Assistance must be provided on timely basis |
| 4 | Difficulty in obtaining agricultural inputs | • Price of agricultural inputs must be monitored regularly<br>• Agricultural inputs must be made available to farmers at reasonable price |
| 5 | Difficulty in repayment of loan | • Loan repayment period must be increased for flood affected farmers. |

| | | |
|---|---|---|
| 6 | Lack of pure water | • Water in the flood affected areas must be tested in order to ensure that the water is safe. |

**Source:** Primary Data

## Conclusion

Kuttanad is well known for its Agriculture resources and below sea level farming. It's the area rich in backwaters, which was hugely affected by the flood. Edathua is one among the Grama Panchayat in Kuttanad, and it's entirely determined by the wave. Agriculture and allied sectors faced a severe setback. All the respondents were doing integrated farming and mainly cultivating paddy, plantain, vegetables, and coconut. The flood continued for 12-15 days, which had destroyed the infrastructures, the farmers had to go for immediate maintenance and repairs, which cost a lot to them. Almost all farmers had borrowings from banks, and they had taken the loans to do agriculture, i.e., as an initial capital or investment for doing agriculture and allied sector. And most farmers are taken KCC and Agricultural Gold Loan. Due to flood, a default in repayment is a common thing to all farmers. The tide had a significant impact on the livelihood of farmers; the government had provided an only certain sum of assistance and which is inadequate for them to meet this loss. The government should help these farmers to overcome these conditions; otherwise, they will suffer colossal debt, which would be a reason for them to leave this sector.

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## Author Details

**S.L.Santhi,** *College of Co-operation, Banking and Management, Kerala Agricultural University, Thrissur, Kerala, India.* ***Email ID:*** *santhisamol@gmail.com*

**Dr.G.Veerakumaran,** *Professor, Department of Co-operative Management, College of Co-operation, Banking and Management, Kerala Agricultural University, Thrissur, Kerala, India.* ***Email ID:*** *g.veeran@kau.in*