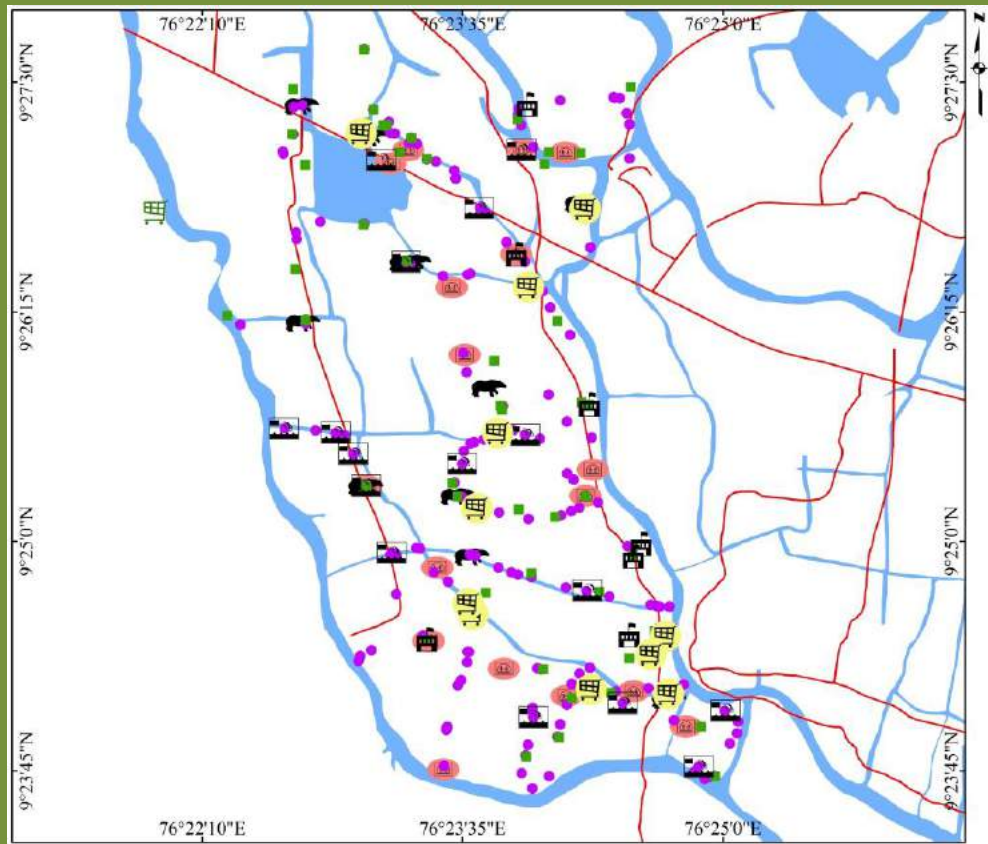




KERALA FLOODS, 2018 - A STUDY ON EMERGENCY SUPPLY CHAIN LOGISTICS IN KUTTANAD, ALAPUZZHA

VOLUME I



Tata Institute of Social Sciences
V.N. Purav Marg, Deonar, Mumbai - 400088.

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EXECUTIVE SUMMARY

TISS being a leading institution with a capacity in the social science domain of Disaster Risk Reduction worked on mapping gruel Centres, animal camps, culverts and public distribution points in Kuttanad Taluka in Alapuzha. This was on account of the state government's recommendation and JTSDS, TISS expertise in field action research, specific to this case with the purpose of assessing the supply-chain mechanisms of delivery of relief materials to the gruel centres and animal camps. Volume I of the Report presents the background of the task undertaken by the TISS Team in Kuttanad as a part of their initiative in the Kerala Floods. The field work required the physical mapping of the required points by using smartphone devices on Google Maps. The points received were tabulated employing ArcGIS and is compiled in Volume II of the report. Volume I of the report documents the nuances of the Public Distribution System and the Integrated Child Development Scheme as key initiatives by the government to supply food material. The report documents the pivotal role played by Supply Co. and Horti Corp in Kerala to ensure 'the last mile' delivery of necessary goods. The report analyses and documents data collected on the management of gruel Centres in the region by mapping the flow of produce and the availability of food, water and fuel during the floods while incorporating data on the storage and transportation of the necessary material. Based on the data collected, Volume I comments on the challenges faced in management of the gruel Centres and the sustenance provided by different agencies, like the cooperative agencies which can be considered as the possible solution to the market failure due to the disaster. The report documents people's participation in the rescue and relief operation, in a way, reaffirming the agency of the people who are affected by a disaster. The report presents the importance of the network of gruel Centres as the source of support during disasters for people at the margin due to their social, economic, and geographic vulnerabilities. The insights that the TISS team has gained from the field engagement with various actors such as people affected by the flood, the functionaries of local self-governance, and government officials engaged in the disaster management operation are key points of consideration for disaster mitigation efforts. This proves as an initial understanding of an amalgamation of state's intervention and field knowledge within the context of supply chain in particular and disasters in general and paves the way for future research undertakings within a similar framework.

ACKNOWLEDGEMENT

The Team from Tata Institute of Social Sciences consisting of faculty members and students of Social Work and Disaster Management were given a unique opportunity to work in the flood affected region of Kuttanad Taluk in Alapuzha. The Team is extremely grateful to the Government of Kerala for appreciating our academic endeavor and providing support. The tasks were identified under the able guidance of Dr. ShekharKuriokose, Member Secretary, KSDMA. We are grateful for his encouragement as he helped the Team to understand the intricacies of the tasks assigned and carry it forward. Mr. Suhas S, District Collector, Alapuzha and the entire district administration at Alapuzha was extremely supportive of the work undertaken by the Team and we are grateful to them for their involvement.

The Team is extremely grateful to Mr. Premji for his unconditional support, encouragement and immense patience with us. The District Disaster Management Authority, Alapuzha anchored by Ms. Cinthu supported the Team in coordinating interviews and providing relevant data to the Team. Mr. Sarath and Ms. Parvathy from the Collectorate and students from the SD College were of great help on the field to the Team for translation and conducting interviews. The Team is thankful to the Karmasadhan Pastoral Centre for extending a warm welcome to us in their premise. The cheerful women from Kudumshree kept the Team well-nourished with food and were very accommodating of our hectic schedule.

The Team is grateful to United Way for their financial support and the Steering Committee, TISS for facilitating the process and giving us an opportunity to work in Kerala and gain experience from the on-field learnings. We are thankful to Dr. Ambekar for her watchful care and the administrative staff of TISS for supporting us.

TISS Team for Kerala

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BACKGROUND

Immediately after the floods in Kerala, a Steering Committee¹ was constituted under the Director at Tata Institute of Social Sciences to decide on the course of action for TISS disaster response in Kerala. Prof. Janki Andharia, Dean, School of Disaster Studies and Prof. Asha Bano Soletti, Dean, Student Affairs volunteered to make a pilot visit in the last week of August. It was decided that they would go to Trivandrum and then to Mapuzha and Wayanad as the most severely affected districts. Funds also needed to be raised and Prof. Andharia wrote several proposals and had meetings with some donors.

During their visit Prof. Soletti and Prof. Andharia met, the Finance Minister, Dr. Thomas Isaac, Collector, Alappuzha, Mr. Suhasand other officials from Kerala State Disaster Management Authority and the several others at the district administration. Through a fairly elaborate process of engagement on ground with worst affected communities and with NGOs, it was decided that the volunteers would go between 15th and 30th October after the semester exams and they would be working in Alappuzha at the invitation of the government. At the Institute Prof. Nasreen Rustomfram organized vaccinations through the health centre at TISS and also a two-day orientation workshop for volunteers, with several faculty and colleagues contributing.

Prof. Janki Andharia made another visit from 9th to 15th October to organize the logistics and also ensure that formal communication was received from the government about the tasks that students were to perform. Dr. Sekhar Kuriakose, Member Secretary, KSDMA in a letter dated October 11, 2018, stated that TISS being a leading institution with capacity in social science domain of Disaster Risk Reduction will work on supporting the supply-chain TISS team:

1. Mapping of the gruel centres in select, highly flood affected panchayats
2. Mapping of all culverts and bridges in the panchayat with photographs
3. Mapping of all animal camps in the panchayat
4. Mapping of all public distribution system offices in the panchayat

¹ TISS Steering Committee – Dr. Shalini Bharat, Mr. CP Mohan Kumar, Ms. Indira Pasupathy, Dr. Janki Andharia, Dr. Nasreen Rustomfram, Dr. Asha Banu Soletti, Dr. Anil Kumar K, Dr. Bino Paul, Dr. Ramakumar R, Dr. PK Shajahan, Dr. Bipin Jojo, Dr. Smitha Nair, Dr. Sheela Rajendra, Dr. Shubhada Maitra, Dr. Rajani Konantambigi and Dr. Sheela Rajendra.

5. Assessment of supply-chain mechanisms of delivery of relief materials to the gruel centres and animal camps

A Team of 32 students, along with 6 faculty members – Dr. BipinJojo, Dr. Manoj Joseph, Dr. V. Ramesh Veerappan, Ms. Saumya Kumar and Dr. Abhishek Banerjee worked with the students on the field in the Kuttanad area on the identified tasks from October 15, 2018 onwards.

On the first day, the Team interacted with Mr. Suhas S, District Collector, Alappuzha, who made a detailed presentation about the various initiatives undertaken by the Collectorate in the district in the post disaster context. A report on cluster housing was submitted to the Collector and the Disaster Management Cell in the Collectorate by the TISS team at the request of the district administration. The Tehsildar, Mr. Premji and the DM Cell at the Collectorate were extremely supportive of the TISS team and were able to provide considerable background data required to carry out the tasks. The team was residing in Karamsadan Pastoral Centre in Alappuzha and the data collection process in the field was undertaken over 11 days, while 2 days were spent on cleaning and systematizing the data collected. Simultaneously, interviews were being conducted on the field and also at the Collectorate.

The report is divided into two parts – Volume I and II. Volume I provides an overview of the process employed to collect data and the observations. It also includes key learnings of the students from the field work which concluded on October 31, 2018, with a short report and a presentation to the collectors. Volume II is a compilation of the maps developed from the points collected over the period based on which the report was formulated.

Back in TISS, a research officer was appointed for generating various maps under the supervision of Dr. V Ramesh while other faculty colleagues supported the data analysis and report writing. Besides Dr Ramesh, Saumya Kumar, Dr. BipinJojo, Dr. ManojJoseph and Prof. JankiAndharia have authored this report.

METHODOLOGY

The Team worked with the target of completing one panchayat a day and towards the end was able to work on two panchayats in one day. The student teams (attached as Annexure 2) were identified one day in advance based on the number of wards and the approximate size of the wards based on plot visits to the Panchayat Office on the preceding day. This was determined by the maps received from the Panchayat Office, if available. The physical mapping of the points was followed by a transect walk in each ward. The ward members were mostly the focal point of contact during the process and were very cooperative. In addition to that, a list of gruel centres was procured from the village officer every day.

The initial approach to mapping was by making use of Garmin GPS devices to capture geolocations that were relevant to our study. This method was then dropped in favour of Google Maps on smartphone devices (SD) as Garmin GPS devices were not powerful enough to capture accurate spatial coordinates with minimized locational errors due to the fact that GPS devices make use of direct satellite communication to gather coordinates of locations which is subject to error due to interference of the atmosphere, cloud cover, tree cover and building cover which hinder the path of the electromagnetic radiation travelling to the GPS device from the satellite. Smartphone devices made use of nearby telecommunication mobile towers for receiving information and lock on the position of the device, hence providing much better accuracy in most of the cases. Hence smartphone devices were preferred over GPS devices in this case. Also, in smartphone devices live location can be tracked, traced and overlaid over Google imageries for immediate reference, visualization and verification. Source data was obtained from the Panchayat which included geo-referenced Panchayat map, hand-made and computer-generated ward boundary maps and topological maps (Figure 1).

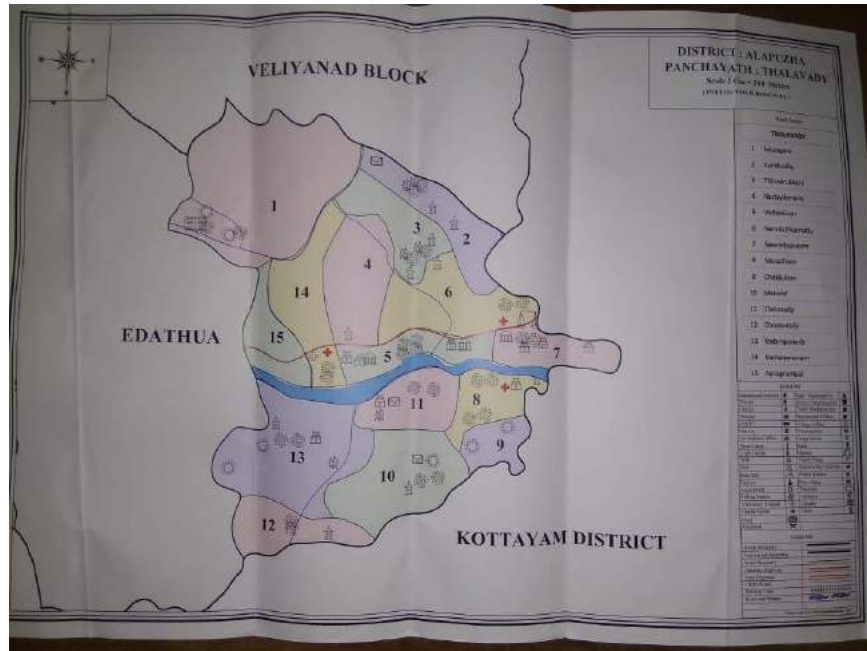


Figure 1: Map obtained from Thalavady Panchayat Office, Alappuzha

Culverts were physically located and verified through ground verification. The locations were captured using SD and photos were taken for verification. Government institutions (anganwadis, primary health centres, government schools and veterinary hospitals) were located with local help and physically verified as represented by Figure 2.

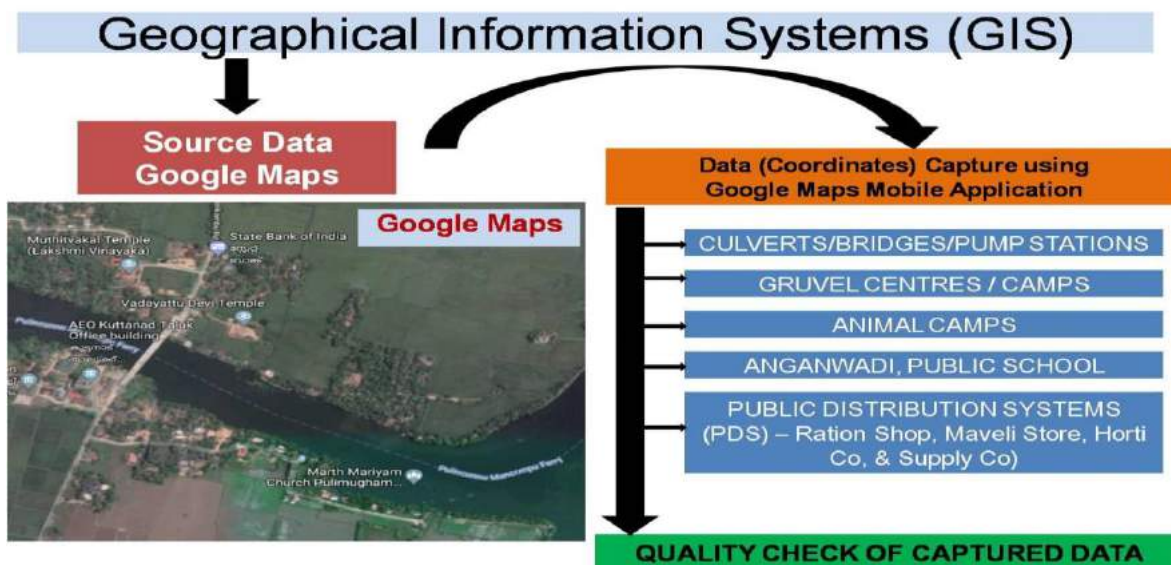


Figure 2: Methodology adopted for mapping the key points

GRUEL CENTRES

The gruel centres act as the last mile delivery during the flood situation where the products are processed and consumed. Each gruel centre has a Convener who is in charge of the households that took support from these centres during the floods. The convener collects ration cards from each household and arranges food items from the stores where transportation cost is borne collectively by the members of gruel centres. The necessary food items are procured from the Maveli centres by means of transport such as boats. The meals are then prepared at the gruel centres or the Community kitchen and distributed to the families. Community kitchens were established in all the 4 parts of the ward, (at least one per ward), which served food 4 times a day. The food included -

- Tea, biscuit for breakfast
- Rice, sambhar, curry, pickle for lunch,
- Tea biscuit for evening snacks
- Rice, sambhar for dinner.

In order to locate the gruel centres, we sought the help of panchayat officials. We were informed that the database of the gruel Centres is maintained by the village office. We tried to get these lists from the respective village offices before the survey. However, such a list was not easily available. In some instances, respective officials who kept the record were not available and in other cases, it was noticed that the data given by the village office was unable to meet the needs of the study as these lists were either incomplete, or structured differently by different village offices, or had not accurately included information on all the camps that were set up in the three months of the flood.

In order to fill in the gaps in these official lists, different approaches were employed. We contacted the ward members or other well-informed community members, such as members of the Area Development Society, Community Development Society or ASHA workers to take us to the locations of the various gruel camps. Apart from this, we used the snowballing technique where we enquired the location of the next gruel camps from the members of the former ones. We had discussions with the gruel camp members so as to have a better understanding about the functioning of these gruel Centres. The members belonging to these camps provided basic information. They could not provide specific required information by this study. We were asked to

interview the Convener to get in-depth information and relevant details about the functioning of the camps.

The team also recorded their observations in the field and made notes on a daily basis. These recordings were used to develop structured interview schedules which aimed at collecting information on parameters such as the number of families eating in each gruel centre, raw material used, the sources of these materials, etc. The team reviewed the schedule and reframed the questions. They included both open ended and close ended questions. Data was collected from over 120 gruel Centres in the Kuttanad region.

Animal Camps

The team had the mandate to identify and give geo-referenced locations of animal camps which acted as a shelter for cattle during the floods. We tried to get the database of such animal camps from Panchayat Offices and from the veterinary hospitals. However, there was no data available regarding their numbers, locations and the number of animals kept in an animal camp. In other words, in most panchayats, such database was not maintained. An effort was made to get it from some veterinary doctors, but it was not easily available either. Thus, we have had to rely on the local people or the ward members who accompanied us during the survey to identify such locations and figures whose accuracy may need to be looked into further.

We enquired about the location of these camps, how the animals survived in these camps, how they were fed, with what they were fed, cattle deaths and the diseases they may have suffered. The locations of these animal camps were geo-referenced and was given a short description to describe the area where each camp was located. Although we tried to find accurate answers to the specific questions around numbers, we succeeded only partially. Some ward members helped us to locate the elevated bridges which were also used to keep animals during the flood.

Mapping Public Distribution System

The team explored the supply chain of the Public Distribution System (PDS) in Kuttanad. We examined how the supply chain of the ration shops, Maveli store/SupplyCo and anganwadis, operated during the flood and post flood period. The first step was to locate such PDS and SupplyCo Centres physically and map its GPS coordinates. Apart from this, the team developed a checklist to assess functioning of such outlets during the flood. In order to understand and map the

supply chain, ration shops were located with local help and physically verified by the field team. If the owner of the ration shop was present, they were interviewed by employing a questionnaire to gauge the supply chain and the storage capacity of the ration shops. Maveli stores were also located with local help and physically verified.

The store manager or the ration shop owner was interviewed to get a clear idea about the supply chain from the depot to the retail outlet, while an interview with the depot manager fetched sufficient details about the supply to the depot. The district supply officer, regional managers and other higher officials were interviewed to gain further insights into the supply chain in the Public Distribution System and also to triangulate data. The officials (usually the teacher) of the anganwadis of each ward as well as the officials of the head anganwadi, which controlled the supply to each of the anganwadis, were interviewed to obtain information on the supply chain of anganwadis and the impact of the floods on their supply.

The two distinct systems of PDS – ration shop and the supplies from SupplyCo were analyzed under separate headings wherein the much-nuanced role of the SupplyCo in distribution of supplies during the floods was clearly identified. After clearly tracing out the path of supply and the modes through which the supply reaches the respective outlet of the particular ration store or SupplyCo, it was essential to understand the supply to the particular depot from which the materials were transported to the respective outlets. The normal functioning of these two strands of supplies needed to be carefully understood, so as to compare with the scenario during the time of a disaster. The field level collection itself was a very intensive and exhaustive exercise by a team of 32 students and faculty members. On some days, students from local colleges accompanied the TISS team in which not everyone spoke Malayalam. Each night, data was systematically collated and entered in excel sheets.

PROFILE OF KUTTANAD

Alappuzha district (Figure 3) has 6 Municipalities, 1 district panchayath, 12 block panchayaths and 72 gramapanchayaths. The total geographic area of the region is 1100 sq. km. Kuttanad, the rice bowl of Kerala, shares its boundaries with Kaduthuruthy - Vaikom road in the north, Kaduthuruthy - Kottayam - Mavelikkara railway line in the east, Mavelikkara - Haripad - Thottapally road in the south and Thottapally - Alappuzha - Thanermukkom road in the west.



Figure 3: Map of Alappuzha District

Kuttanad Taluk (**Figure 4**) is a highly complex, dynamic and unique rice growing agro-climatic tract of Kerala lying 0.5 to 2.5 m below MSL. It extends between North latitudes 90 8'' and 90 52'' and East longitudes 760 19''E and 760 44''E. It comprises an area of 54 revenue villages spread over Alappuzha, Kottayam and Pathanamthitta districts. It is well-known for its vast paddy fields and geographic uniqueness. Farmers of Kuttanad are famous for bio-saline farming and FAO has declared this system as Globally Important Agricultural Heritage System (GIAHS). The region is categorized into Lower, Upper and North Kuttanad. Kuttanad taluk falls in Upper Kuttanad.

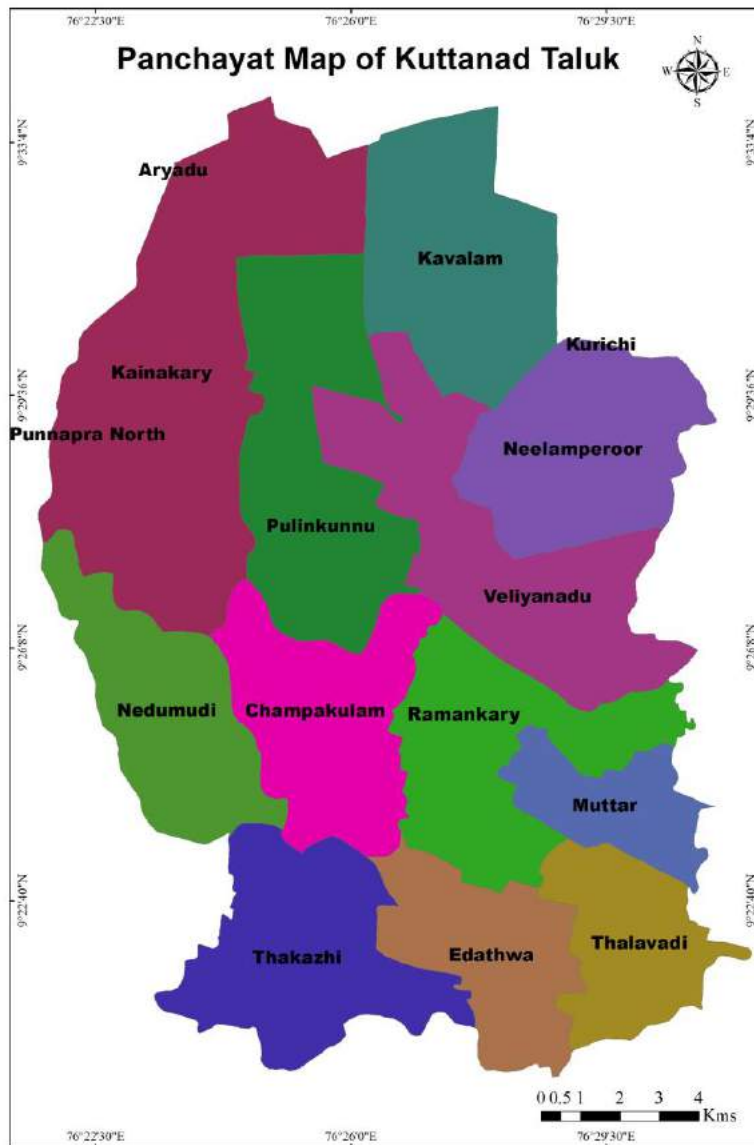


Figure 4: Panchayat map of Kuttanad Taluk

KUTTANAD: A COASTAL WETLAND

Kuttanad acts as a receptacle to receive the flood waters of the fast-flowing river systems Periyar, Muvattupuzha, Meenachil, Pampa and Achenkovil, all originating from the Western Ghats in Kerala and Tamil Nadu which receives two monsoonal rains, south west and north east. These rivers and their distributaries criss-cross Kuttanad wetlands many connecting to the Vembanad lake before meeting Arabian Sea. The organic matter transported from the high ranges makes Kuttanad a unique ecosystem in the world due to its location near equator, equitable temperature regime, high rainfall and high solar radiation throughout the year similar to Philippines in the tropics.

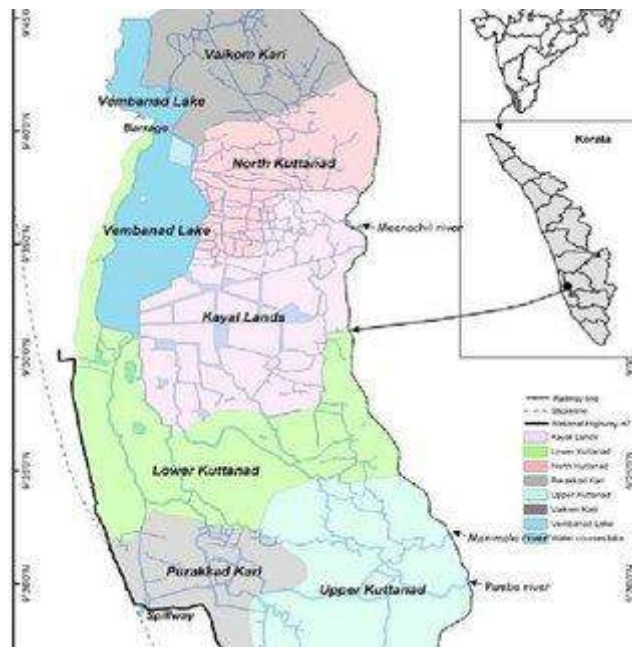


Figure 5: Human Impact on Kuttanad Wetland Ecosystem -An Overview

(Source: Ashtamoorthy, S., 2013)

Manimala River - Originates from Mothavara hills in Kottayam district enters the district at Thalavadi village in Kuttanad Taluka and passes through Edathua and Champakulam villages and joins the Pamba river at Muttar. The villages of Manimala, Mallappally, Kaviyoor, Kalloppara, Thalavadi, Kozhimukku and Champakkulam lie in the course of the river Manimala. It has a length of 91.73 Km and drainage area of 802.90 Km.

Pamba, the third longest river in Kerala is formed by several streams originating from Peerumedu plateau in Idukki district, enters Alappuzha district at Chengannur and flows through Pandanad, Veeyapuram, Thakazhy, and Champakulam through a distance about 177.08 kms and plunges into Vembanad lake through several branches such as PallathuruthiAr, NedumudiAr and Muttar. The river has a length of 117 kms and is navigable to a length of 73 kms. The catchment area of this river is 1987.17 sq km. The main tributaries of the river are Pambayar, KakkiAr, ArudaiAr, KakkadAr and Kallar.

Achankovil River - This river often known as Kulallada river, originates from Pasukidamettu, RamakkalTheri and Rishimalai of Kollam district enters the district at Venmony and has a catchment area of 1155.14 Sq.Kms and a marginable length of 32.19 Km. Passes through Cheriyanaad, Puliyoora and Chengannur villages, enters Mavelikkara Taluk at Chennithala, flows through Thriperumthura and pallippad villages and joins Pamba at Veeyapuram.

Vembanad Lake -The Vembanad lake, the most important of the west coast canal system has a length of 84 Km and an average breadth of 3.1 Km. It covers an area of 204 Sq.Km. Stretching from Alappuzha to Kochi. Borders Cherthala, Ambalapuzha and Kuttanad Taluks of Alappuzha district, Kottayam, Vaikom and Changanasserry taluks of Kottayam district and Kochi and Kanayannur Taluks of Ernakulam district. Pamba, Achankovil, Manimala, Meenachil and Muvattupuzha rivers discharge into this lake. Pathiramanal, often called the mysterious sand of midnight, having coconut palms and luxuriant vegetation is situated in the centre of this lake. Perumbalam and Pallippuram are the other islands in this lake. The Thannermukkom regulator constructed across Vembanad lake between Thannermukkom and Vechur is intended to prevent tidal action and intrusion of saline water into the lake. It is the largest mud regulator in India.

Kayamkulam Lake -Stretching between Panmana and Karthikappally, Kayamkulam lake is a shallow lake which has an outlet to sea at Kayamkulam barrage. It has an area of 59.57 Sq.Km., a length of 30.5 Km and an average breadth of 2.4 Km. It connects Ashtamudi lake by the ChavaraPanmana canal.

Canals - Alappuzha has a network of canals included in the west coast canal system which are used for navigation. The important canals are Vadai canal, Commercial canals and the link canals between these two canals. Apart from these, there are many inland canals which are mainly used

for passenger navigation and commercial purposes. The lakes are used for inland water transport of passengers and cargo. Inland fisheries have also flourished in these waters.

Coast -Alappuzha has a flat unbroken sea coast of 82 Km length which is 13.9 % of the total coastal line of the state. An interesting phenomenon of this seacoast during the month of June is the periodic shifting of mud bank popularly known as “Chakara” within a range of 25 Km in Alappuzha-Purakkad coast due to hydraulic pressure when the level of backwater rises during south-west monsoon.

Most of the areas in Kuttanad are flooded every year during the South-west monsoon. During the monsoon floods, the whole area becomes engulfed under a vast sheet of water as the above rivers branch into many water courses which are connected to one another. The flood waters move towards the Vembanad Lake to be drained to the Arabian Sea through Cochin Estuary. Vast areas of paddy fields get submerged for one or two weeks resulting in considerable loss. Communication and accessibility of the area become difficult as important roads in the locality get branched or submerged under water. The area includes mainly the wet rice fields and dry garden land like sandy areas, unreclaimed and reclaimed kayal land areas, and rivers, canals, channels and waterways. The garden land is the land where human population of Kuttanad is inhabited which is up to 1.0 m above MSL. The network of canals and rivers are extensively used for transportation, recreation and livelihood.

DEMOGRAPHY: POPULATION

DISTRICT CENSUS HANDBOOK : ALAPPUZZHA									
VILLAGE / TOWN PRIMARY SUB-DISTRICT -									
Location code number	Name of Village/ Town	Area of Village in hectares	Number of households	Total population (including institutional and houseless population)			Population in the age-group 0-6		
				Persons	Males	Females	Persons	Males	Females
1	2	3	4	5	6	7	8	9	10
05675	Kuttanad (Total)	28,939.00	47,416	193,007	93,013	99,994	18,638	9,501	9,137
05675	Kuttanad (Rural)	28,939.00	47,416	193,007	93,013	99,994	18,638	9,501	9,137
05675	Kuttanad (Urban)	0.00	-	-	-	-	-	-	-
RURAL									
628236	Kainakary North	3,317.00	1,919	8,292	4,081	4,211	893	446	447
628237	Kainakary South	745.00	3,770	15,405	7,364	8,041	1,465	715	750
628238	Pulinkunnu	2,859.00	3,652	15,210	7,368	7,842	1,408	698	710
628239	Kunnumma	1,096.00	3,420	14,252	6,961	7,291	1,368	689	679
628240	Kavalam	2,327.00	3,142	13,089	6,433	6,656	1,359	688	671
628241	Neelamperoor	990.00	1,421	5,841	2,858	2,983	529	272	257
628242	Velijanad	1,941.00	3,041	12,501	6,025	6,476	1,151	573	578
628243	Ramankary	1,135.00	2,611	10,755	5,187	5,568	1,077	550	527
628244	Champakkulam	2,297.00	3,932	15,848	7,636	8,212	1,546	784	762
628245	Nedumudi	2,023.00	3,668	14,601	7,049	7,552	1,387	739	648
628246	Thakazhy	2,527.00	3,858	15,758	7,469	8,289	1,596	817	779
628247	Edathua	2,712.00	5,468	21,699	10,378	11,321	2,091	1,061	1,030
628248	Muttar	1,048.00	2,264	9,200	4,437	4,763	924	502	422
628249	Thalavady	1,576.00	5,250	20,556	9,767	10,789	1,844	967	877

Table 1: Data on demography of the Panchayats in Kuttanad Taluka from the District Census Handbook – Alappuzha (2011)

Alappuzha district is home to about 1.9 lakh people, as per the 2011 Census and among them about 93 thousand (48%) are male and about 100 thousand (52%) are female. About 91% of the population are from general caste, 9% are from Scheduled Caste. Child population (aged under 6 years) of Kuttanad taluka is 10%, among them 51% are boys and 49% are girls. There are about 47 thousand households in the sub district and an average of 4 persons live in every family. The number of male and female children is the highest in Edathua followed by Thalavady. The density of children is the highest at Kainakary (South), Kunnumma and Thalavady.

PRIMARY CENSUS ABSTRACT									
CENSUS ABSTRACT									
Kuttanad									
Scheduled Castes population			Scheduled Tribes population			Literates			Name of Village/ Town
Persons	Males	Females	Persons	Males	Females	Persons	Males	Females	
11	12	13	14	15	16	17	18	19	
17,803	8,683	9,120	383	190	193	170,249	82,109	88,140	Kuttanad (Total)
17,803	8,683	9,120	383	190	193	170,249	82,109	88,140	Kuttanad (Rural)
-	-	-	-	-	-	-	-	-	Kuttanad (Urban)
RURAL									
774	371	403	3	1	2	7,238	3,585	3,653	Kainakary North
1,115	545	570	43	19	24	13,611	6,544	7,067	Kainakary South
620	291	329	26	9	17	13,574	6,605	6,969	Pulinkunnu
714	347	367	34	15	19	12,526	6,138	6,388	Kunnumma
1,375	693	682	21	9	12	11,463	5,661	5,802	Kavalam
396	181	215	35	27	8	5,207	2,549	2,658	Neelamperoor
1,135	549	586	44	16	28	11,078	5,371	5,707	Veliyanad
1,592	756	836	12	3	9	9,486	4,556	4,930	Ramankary
1,239	619	620	27	11	16	14,056	6,771	7,285	Champakkulam
1,372	680	692	14	9	5	12,884	6,197	6,687	Nedumudi
2,579	1,242	1,337	31	24	7	13,719	6,514	7,205	Thakazhy
2,162	1,068	1,094	39	20	19	19,120	9,143	9,977	Edathua
924	456	468	2	1	1	8,006	3,830	4,176	Muttar
1,806	885	921	52	26	26	18,281	8,645	9,636	Thalavady

Table 2: Data on the SC, ST and Literacy level in Kuttanad Taluka from the 2011 Census

Recording a negative growth rate, the population of the sub district has decreased by -5.5% in last 10 years. As per the 2001 census, the total population was around 2 lakh. Female population growth rate is -4.5% which is 2.2% higher than male population growth rate of -6.7%. General caste population has decreased by -6.3%; Schedule caste population and scheduled tribe population has increased in Kuttanad taluk as indicated in **Figure 6**. The highest number of SC population is in Thakazhy followed by Edathua, Thalavady and Kainakary South. The lowest population is Neelamperoor and Pullinkullu. The number of females in the SC population in most of the panchayats are more than the males. The highest number of ST population is Thalavady, followed by Velliyanad, Kainankary South. Muttar, Kainakary (North) and Ramankary has the smallest ST population. Much like the SC population, in the ST population the number of females is more in most of the panchayats except Neelamperoor, Nedumudi and Thakazhy.

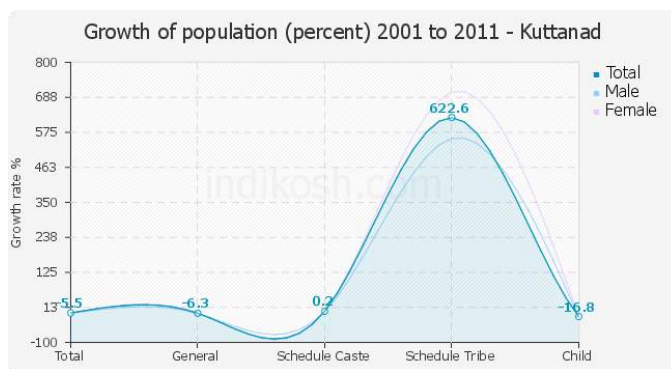


Figure 6: Growth of population (percent) 2001 to 2011 – Kuttanad

As per the 2011 census there are 1075 females per 1000 male in the sub district. Sex ratio in general caste is 1078, in schedule caste is 1050 and in schedule tribe is 1016. There are 962 girls under 6 years of age per 1000 boys of the same age in the sub district. Overall sex ratio in the sub district has increased by 25 females per 1000 male during the years from 2001 to 2011. Child sex ratio here has increased by 17 girls per 1000 boys during the same time.

LITERACY

About 1.7 lakh people are literate, among them about 82 thousand are male and about 88,000 are female. Literacy rate (children under 6 are excluded) of Kuttanad is about 98%. 98% of male and 97% of female population are literate here. Overall literacy rate in the sub district has increased by 1%. Male literacy has remained the same and female literacy rate has gone up by 2%.

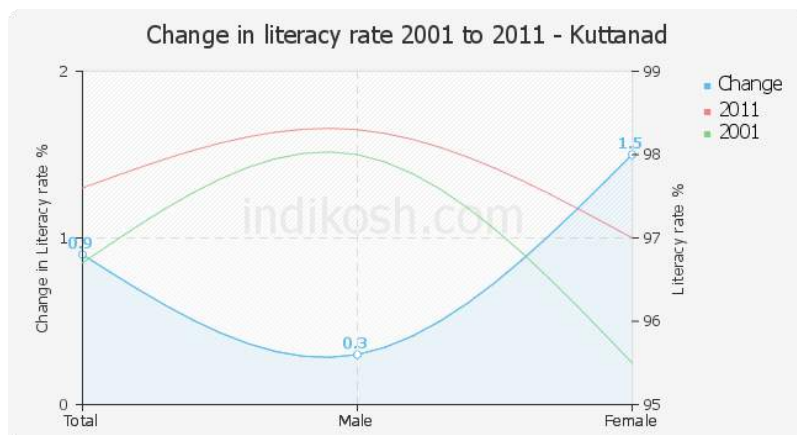


Figure7:Change in literacy rate 2001 to 2011 – Kuttanad

Kuttanad has 38% (about 73,000) population engaged in either main or marginal workers. 53% male and 24% female population are working population. 40% of total male population are main (full time) workers and 13% are marginal (part time) workers. About 12% of total female population are main and 12% are marginal workers.

GOVERNMENT INSTITUTIONS INVOLVED IN FOOD SUPPLY

The major task assigned to the TISS team was to analyze the supply chain mechanism for food material during the floods before the people from Kuttanad were evacuated to different relief camps in Alappuzha and Kottayam. For this task, the team worked on identifying different government schemes and government institutions functioning in Kuttanad which have some or any role to play in the distribution of food material to the people in regular conditions, primarily looking at PDS and ICDS. The team started with exploring the public distribution system in Kerala and interviews were conducted with the District Supply Officer and Tehsil Supply Officer. This was followed by interviewing the Ration Shop License Holder in the different panchayats across Kuttanad during the field work. While working in the field and interacting with the communities, the team realized the pivotal role played by Supply Co., Horti Corp and MILMA in Kerala to ensure last mile delivery of necessary goods. Based on the interviews and secondary material, the team was able to prepare a brief overview of the government institutions and their involvement in the delivery of food material which is presented in this chapter. Based on this understanding, interview schedules were prepared to gauge the supply chain of food material during the floods. The understanding of the government's initiatives for food supply and the response received on the field will help collate inputs on supply chain management of food material during disasters.

1. PUBLIC DISTRIBUTION SYSTEM

The FCI procures grains from Procurement Centres with rice arriving from Tamil Nadu and Andhra Pradesh and wheat arriving from Haryana and Punjab. The rations arrive from Food Corporation of India to their godown in Alappuzha through rail and containers from across the country. For Kuttanad Taluka, the grains are transported from Alappuzhagodown of the District Supply Officer by lorries identified in a contractual manner to the Tehsil Supply Depot in Thakazhi. The Thakazhigodown also procures rice directly from farmers in the Kuttanad area. From the godown, the material is transported to the ration shops in each Panchayat by using lorries tempos. The building for the ration shop is constructed by the owner with no concession from the government. The shop runs as per specifications of the Ministry of Food and Civil Supplies and the owner procures a permit to run the shop.

Within the government, the food availability is anchored in the Ministry of Food and Civil Supplies where the Commissioner of Civil Supplies is the Principal Head of the Department and Principal

Advisor to the Minister of Food and Civil Supplies. The Director of Civil Supplies is the administrative head of the Department of Civil Supplies. The next in the chain of command is the Controller of Ration followed by the Deputy Controller of Rationing which is divided into two zones, that is, the North Zone which is Kozhikode and the South Zone which is Kollam and each having one Deputy Controller. Below the Deputy Controller is the District Supplies Officer followed by the Taluka Supplies Officer/City Rationing Officer. The Ration Inspectors are next who inspect the ration shops. This is the end of the chain of command.

The ration shops use E-Post machine these days which requires the entry of a person's ration card number followed by a fingerprint scan of the person who is the ration card holder. This allows them to purchase rations and the bill displays the amount of materials allotted, amount of materials bought, and amount of materials remaining, cost per kg/litre and total cost of materials bought.

Blue card holders are those who are not priority households but are entitled to subsidies. The blue card holders can avail rice at Rs. 3 per kg for all varieties and Rs. 2 kg per person who is a part of the ration card holder's registered family and atta is given at Rs.16 per kg with 3 kg allotted for one ration card. The non-priority and non-subsidy households are the white card holder for which the material is allotted per card and rice varieties cost Rs. 9.90 per kg. AAY groups get 35 kg of total food materials excluding sugar and kerosene per card. BPL gets 4 kg of all varieties of rice per person identified in the ration card. The data collected provided the basic entitlements of the people living in the region.

2. INTEGRATED CHILD DEVELOPMENT SCHEMES

The Child Development Project Officer (CDPO) has to create a project for the block under which around 6 panchayats fall. When the Block Project is created, the Block can allocate funds to each panchayat. The ICDS Supervisor is then required to create a project at the panchayat level. This allows him/her to allocate funds to each anganwadi in the panchayat. In the Pullinkunu Panchayat, the ICDS Supervisor sends a bill to the Supply Co depending on the amount of materials required at each anganwadi. The materials provided are usually for 1-3 months. The amount of materials required is decided by the ICDS Supervisor depending on the number of children at each anganwadi. SupplyCo then sends the materials to the anganwadi as in the case of Ward 5 of Pullinkunu Panchayat in a lorry. The material is stored at the anganwadi in Ward 5 after counting and weighing. The teachers from other anganwadis in Pullinkunu collect the material from the

Ward 5 and take it to their respective anganwadis. The transportation cost is not reimbursed to the teachers. There has been a slight change now in the system as tenders are invited by the panchayat for the transportation of the material to the anganwadis in Pullinkunu. The lowest tender is selected by the panchayat. The delivery person has to submit a statement citing the materials delivered to each anganwadi which has to be signed and verified by the anganwadi teacher or helper to verify delivery. The payment to the delivery service is made only when the entire process is completed. The tender submitted contains the cost of transporting one kilo of material. The vehicles used include, autos and tempo.

The materials provided include rice, puttu powder, black channa, pulses, suji wheat, wheat and jaggery. Vegetables have to be purchased separately, the money for this is reimbursed only if it is included in the project and it is at 50 paise per child. The money for gas is allowed to a bill of Rs. 803 but the actual cost of a gas cylinder is Rs. 960. Toys for the children are funded by the CDPO office and panchayat depending on the project developed. The building and other costs all need separate projects to be created in the panchayat. The panchayat has the discretion to allocate funds from its budget to the anganwadis for the construction of building and maintenance of existing infrastructure.

3. SUPPLYCO AND MAVELI STORES

The Kerala State Civil Supplies Corporation Limited acts as the execution arm of the Department of Food and Civil Supplies of the Government of Kerala. The corporation runs a chain of retail supermarkets under the brand name SupplyCo, and a chain of general store retail outlets under the name Maveli stores. Now, to understand the structure of SupplyCo, on the top of the hierarchy, there is the Minister for Food Civil Supplies and Consumer Affairs and on the bottom is the retail outlet manager. In the state of Kerala, a total of 2,033 people work directly for the Corporation while another 1,175 work on deputation. There are a total of over 5,000 employees including those on daily wages.

In SupplyCo, about 13 items are subsidized such as rice, oil, sugar, chilly, beans etc. They are available at a subsidized price for a specified quantity to only those who produce a valid ration card. There is a particular quantity associated with each of the subsidized items, determined on a monthly basis. After the quota is consumed by the customer, the full rate of the product (without the subsidy) is levied on the customer.

The supply chain in SupplyCo is to be understood at two levels – First, the central Purchase system and secondly, the depot level purchase system.

Central Purchase System: In central purchase system, indents which are being collected from various SupplyCo outlets are consolidated, segregated and sent to the consigned depot. These indents are then verified at the head office, where a purchase order will be issued.

Depot level Purchase system: Indent is collected from various outlets and submitted to the depot, wherein the Junior Manager verifies the indents, and issues the purchase order jointly with the depot management committee, which has 6 members.

Now, to understand the allocation of grains to the SupplyCo, at the top, there is central allotment while, at the state level, there is sub allocation, where the SupplyCo's of the 6 taluks of Alappuzha are allotted as per requirement. The grains are primarily procured from the FCIs, who get their supply through central procurement, wherein the grains are obtained predominantly from the northern parts of India. There are 2 FCIs of primary importance to the study area (Kuttanad Taluk) – one in Alappuzha and one in Mavelikkara. Out of the total 6 Taluks of Alappuzha, the Alappuzha FCI supplies grains to 3 Taluks while the one in Mavelikkara supplies grains to the other 3 taluks in Alappuzha. The godown in Kuttanad taluk is located at Thakazhy. Items excluding food grains, oil etc. are procured from the open market, which is relatively expensive. To elaborate more on supply from third party agencies or private players, it is categorized into two types – one in which the stock is sent directly from the concerned agencies or private players to the concerned retail outlets, while, in the other category, stock is supplied to the depot by the respective agency. The responsibility of the third party to supply the material ends there. The significant charges incurred for loading and unloading by the agency in the direct supply to the retail outlet is compensated for to the respective agency or private player.

SupplyCo outlet intimates the custodian as stock gets depleted. The custodian is primarily responsible for handling the indent generated by the outlet. There are two types of custodians – Maveli custodians and Non-Maveli custodians. The 13 subsidized items and their procurement are associated with the Maveli custodian while the Fast-Moving Consumer Goods (FMCG) and their procurement by the SupplyCo is channeled by the non-Maveli custodian. The prices of items are decided by the regional managing director, purchasing manager, etc. on a monthly basis.

Maveli stores are the departmental or grocery stores under Supply-Co which stores all kinds of items like rice, sugar, coconut oils and vegetables. From the warehouses, the Supply-Co supplies the commodities to the Maveli stores.

4. MILMA

The current system of dairy development society follows the Anand Model. For this the Kerala Co-operative Milk Marketing Federation Ltd. also referred as MILMA was formed by the State. The farmers are members of the Anand pattern co-operative societies and the presidents of Anand Pattern Co-operative Societies of the regional milk unions form the Kerala Co-operative Milk Marketing Federation Ltd. At the grassroots level, the co-operative societies are grouped under three Regional Co-operative Milk Producers' Unions - Thiruvananthapuram region, Ernakulam region and Malabar region.

The dairy development society of ward 7 in Pullinkunu functions in the following manner. The farmers from wards 3, 4, 5, 6, 7 and 8 bring milk to the collection point in Ward 7. The milk is sold to locals for a lower price from the collection Centre itself. The rest of the milk is transported to Punannur. The milk is stored here in cold storage and then it is sent to Alappuzha for pasteurization before being sold under the brand name of MILMA.

The dairy development society procures fodder for the cows from Kerala Feed. This fodder is given on loan to farmers depending on the amount of milk obtained from each farmer. There are however some farmers who do not procure fodder from the society. MILMA sends a bill for 10 days' worth of milk 15 days after procuring milk from the society which is sent to account of dairy development society and is distributed on the basis of the contribution made by individuals. This money is used to pay the farmers and also to procure fodder from Kerala Feed.

The farmers who procure fodder get paid once a week for the milk provided minus the fodder charges. The farmers who do not procure fodder are paid on each day that they provide milk to the society.

5. GOVERNMENT SCHOOL

The school gets its funds from the state government under the SamagrahShikshaAbhiyan(SSA) which is a Central Government scheme. The SSA is funded jointly by the Centre and State of Kerala in the ratio 60:40. The entitlements of the scheme include free textbooks for all students

from classes 2 to 8, two sets of uniform costing around Rs.400 per unit for all students except APL boys. School grant of Rs.5000 for lower primary and Rs.7000 for upper primary schools is provided. To provide supplementary learning facilities and school maintenance, a separate school maintenance grant is provided to the elementary school for the preparation and development of supportive materials of classroom transaction to teachers (Rs. 500). Teachers salary, teachers training, is supported through Block Resource Centres (BRCs) and Cluster Resource Centres (CRCs) which functions at the Panchayat level. Special initiatives are undertaken for bringing out of school children mostly from disadvantageous communities like SC, ST, minorities, to the schools.

For the mid-day meal, the bills for rice are sent to the Maveli Store based on numbers sent by the government school regarding the number of students at the school. For one child, it is 150 gm rice and the rice are the only material provided by the Maveli Store. For materials like vegetables, petrol, gas cylinder, a sum of Rs.8 is allotted for each child. This sum is multiplied for each child and the number of working days. The amount includes the costs of 150 ml of milk for 2 days per week and 1 egg or 1 banana for 1 day per week is also included. The rice is supplied by lorries to each school once a month, generally. In Pullinkunu, vegetables and other essentials mentioned above are purchased from stores close to the school to avoid or reduce transportation cost.

6. GRUEL CENTRES

The raw materials and grains are sold at subsidized prices to the Gruel centres or the consumers. The demand from the public has expanded the stores that each panchayat of the Taluk has at least one Maveli store.

The key actors in the supply chain of food material to the affected communities-

Convener: The role of Convener in the supply chain is to ensure the availability of raw materials to the gruel Centres (GC). The Convener takes the ration card of all the members from the gruel Centre to the PDS/Maveli store/Horti Corp /Other venders to procure the material on the basis of the requirement of each GC based on the number of ration cards. Basically he/she is responsible for management of all finances and transportation of the food materials from the source to the GC. In ward 8,Kovallam, theConvener of the GCs were mostly women and men acted as helpers due to strong presence of Kudumshree in the area

Ward members: The role of ward member was mainly of documentation or administrative work. She/he was responsible for appointment of or making sure that every gruel Centre has a Convener. They had the record of all the GCs, number of families based in the GC in their areas and the total expenditure incurred by each GC.

Village officer: The village officer was responsible for the accounting of all the gruel Centres in the village. As the PDS system was completely shut down, the village officer with the help of district administration managed to make the food grains available by using post-pay indents to Maveli stores. He played major role in ensuring coordination between district administration and ward members and between Supply Co and Horti Corp.

Panchayat: The panchayat had no major role in the supply chain to the gruel, it provided essential help to other agencies as and when required by using miscellaneous funds.

Revenue department: The department was responsible for the overall management of the entire disaster response work. They managed the communication the entire chain from the Maveli stores and the people.

KEY OBSERVATIONS

1. CULVERTS / BRIDGES

Maps have been developed for the Kuttanad taluk marking the culverts in the region. Culverts were identified as permanent or temporary structures over any water body which are/could be used for walking by people and animals. Maps with culverts have been prepared in this study for all the panchayats with a brief description of the place and the pictures taken on the field attached with Volume II. In total, there were 2174 culverts/bridges mapped using GIS techniques with the aid of Google Map application. The number of culverts mapped in each panchayat during the study period is given in the Table 3.

Panchayat	Number of Culverts mapped
Kainakary	101
Neelamperoor	206
Pulincunnoo	191
Kavalam	201
Veliyanadu	191
Ramankary	182
Champakulam	160
Thakazhy	186
Edathua	231
Muttar	153
Thalavadi	216
Nedumudi	156

Table 3: Panchayat-wise total number of culverts/bridges captured

It is clear from the maps that the culverts play a very important role in connecting various parts of the panchayat in Kuttanad since the taluk is transversed by rivers and canals. The culverts often run along the rivers where canals meet the river where the access to the canal is possible on a boat only by passing under the culvert. The maps developed for Edathua Panchayat which has the

highest population in Kuttanad, and the maximum number of culverts, indicating that it is a key feature for connectivity in the region. Observing the map, it is clear that culverts and bridges are located close to the main roads in the region and also provide accessibility to the areas un-accessible via the road especially the rations shops located on the roads. Waterways and boats are the main forms of commute here.

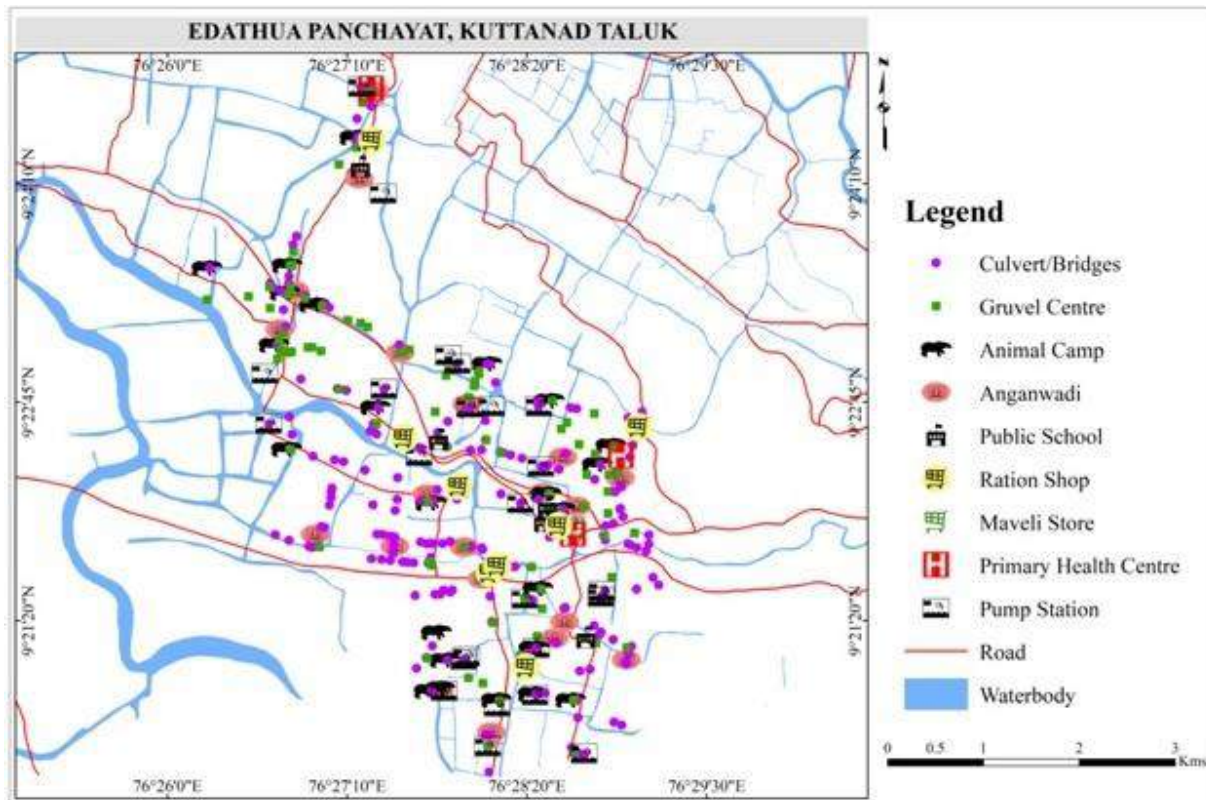


Figure 8: Features captured during the study period, Edathua Panchayat, Kuttanad Taluk

The map from Muttar Panchayat (Figure 9) further confirms the point that culverts being situated along the rivers and the small rivulets are key in ensuring smooth transportation in the region.

Anganwadis and ration shops were not functional in most of the panchayats during the floods as most of them were on low lying areas leading to massive loss of material. In this situation the annual practice of forming gruel Centres by the communities themselves proved extremely critical to ensure the availability of food material. Many of the gruel Centres were located on relatively higher ground. Many of them located on culverts. The culverts, thus, became the key point of collection of material from the Maveli stores and for the distribution of cooked food to the households in the gruel Centres. The map of Muttar and Edathua (Figure 8 & 9) clearly show that

most of the gruel Centres were in close proximity to the culverts. Further in ward 15 in Nedumudiit was observed that the dominantly pastoral community was able to save their cows and chicken as they had access to bridges in their vicinity where they tie them during the floods leading to much lesser loss of cattle in the area.

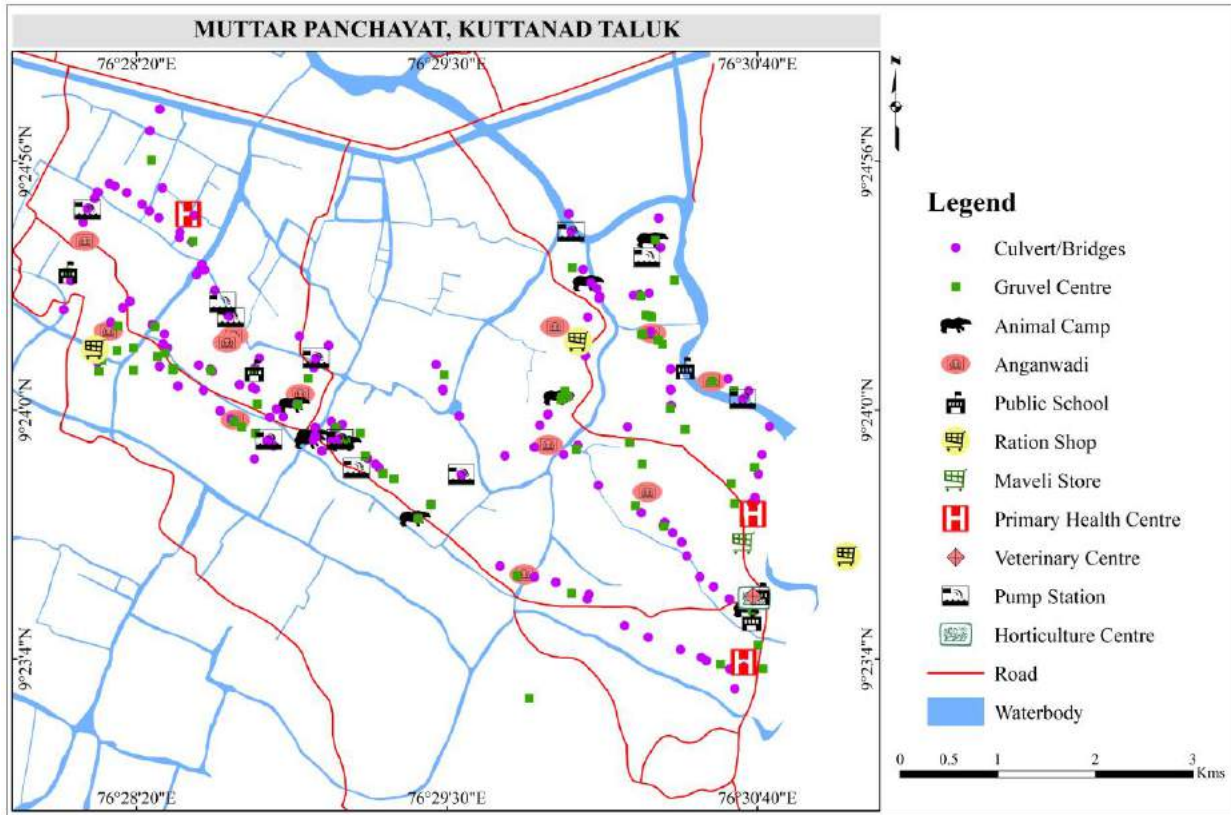


Figure 9: Features captured during the study period, MuttarPanchayat, Kuttanad Taluk

As is evident from Champakulam’s map(Figure 11), most of the gruel Centres were located on the same place as the culverts. The structure of culverts across the panchayats varied as some were constructed by the Panchayat and the State Road and Transport Department across major rivers while some were constructed by the local Panchayat. Many culverts were simply created by using bamboo (Figure 10) by the locals to ensure accessibility to houses as was seen in ward 12 of Ramankary. In ward 1 of Pullinkunnu the height of the culvert created problems for the boat to reach a anganwadi during the floods.



Figure 10: Temporary structure created by locals using bamboo stick which restricted the movement of boats in Ramankary

As a local governing body, village panchayat was a source of communication that kept people informed about the flood situation, alerts, availability of food supplies, procedure to be followed. There was no electricity supply hence people were unable to charge their mobile phones and communicate further. In certain places, ward members conveyed essential information to people. In Ward 9 of Champakulam, the ward member communicated and informed the people. He collected the ration cards, got the signature of the ward member and got the materials from the panchayat.

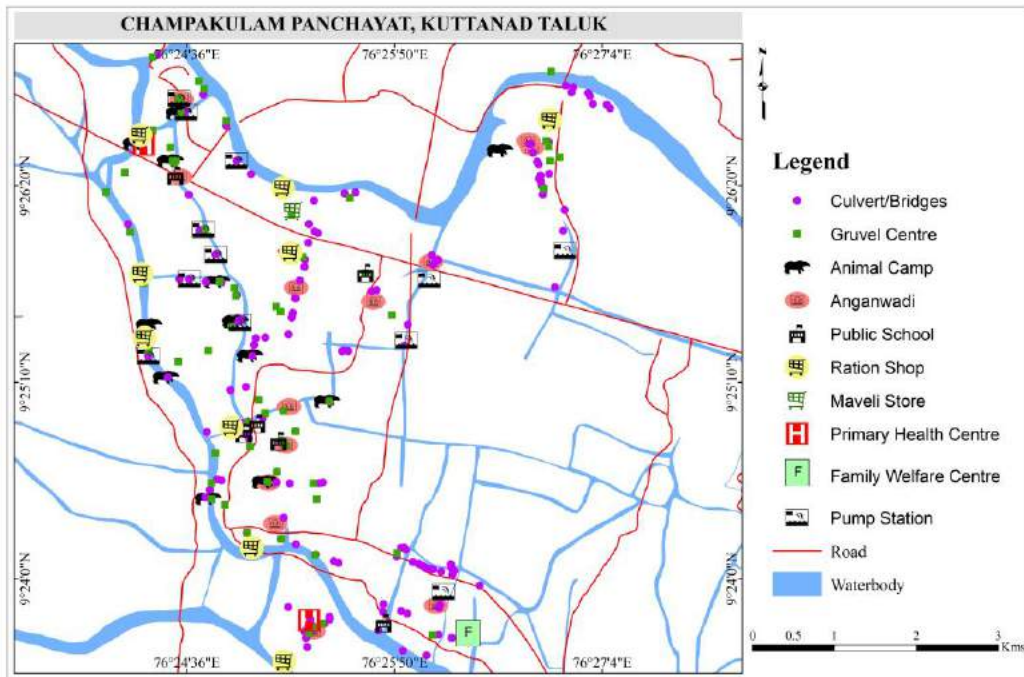


Figure 11: Features captured during the study period, Champakulam Panchayat, Kuttanad Taluk

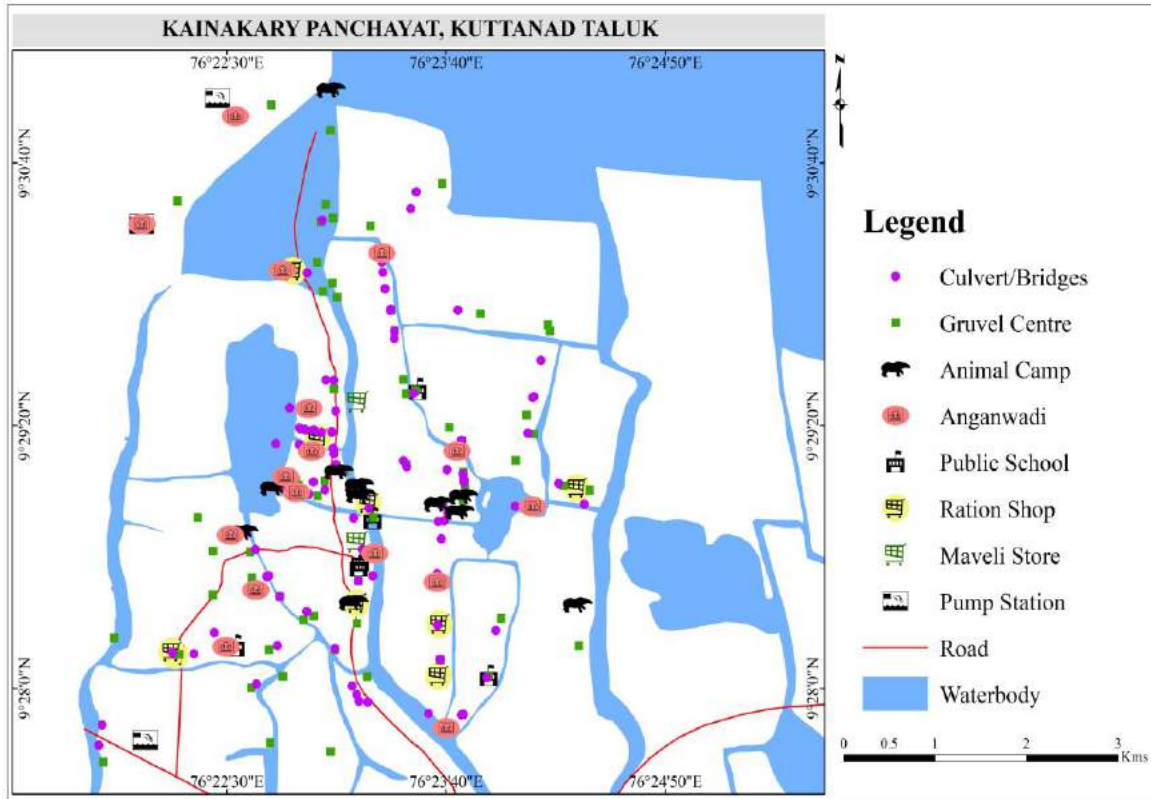


Figure 12: Features captured during the study period, KainakaryPanchayat, Kuttanad Taluk

Considering Kainakry where the population is more scattered and presence of roads is limited, the gruel Centres are placed in locations accessible through water. For Edathua on the other hand, the gruel Centres were located mostly along the roads, indicating more reliability on road transportation. In ward 3 in Ramankary, the gruel Centres were in private, commercial and panchayat property and were located on the main state highway and all worked during the larger floods in August and had a floating population.

2. DAMAGED CULVERTS

From the data, it was observed that there were 49 damaged culverts/bridges. It includes partially/completely damaged culverts, bridges, temporary structures like iron pipe. The number of damaged culverts/bridges in each panchayat is given in Table 4 and shown in Figure 13.

Panchayat	Number of Gruel Centre
Kainakary	1
Neelamperoor	0
Pulincunnoo	4
Kavalam	7
Veliyanadu	7
Ramankary	2
Champakulam	7
Thakazhy	3
Edathua	5
Muttar	5
Thalavadi	1
Nedumudi	7

Table 4: Number of damaged culverts/bridges in each panchayat

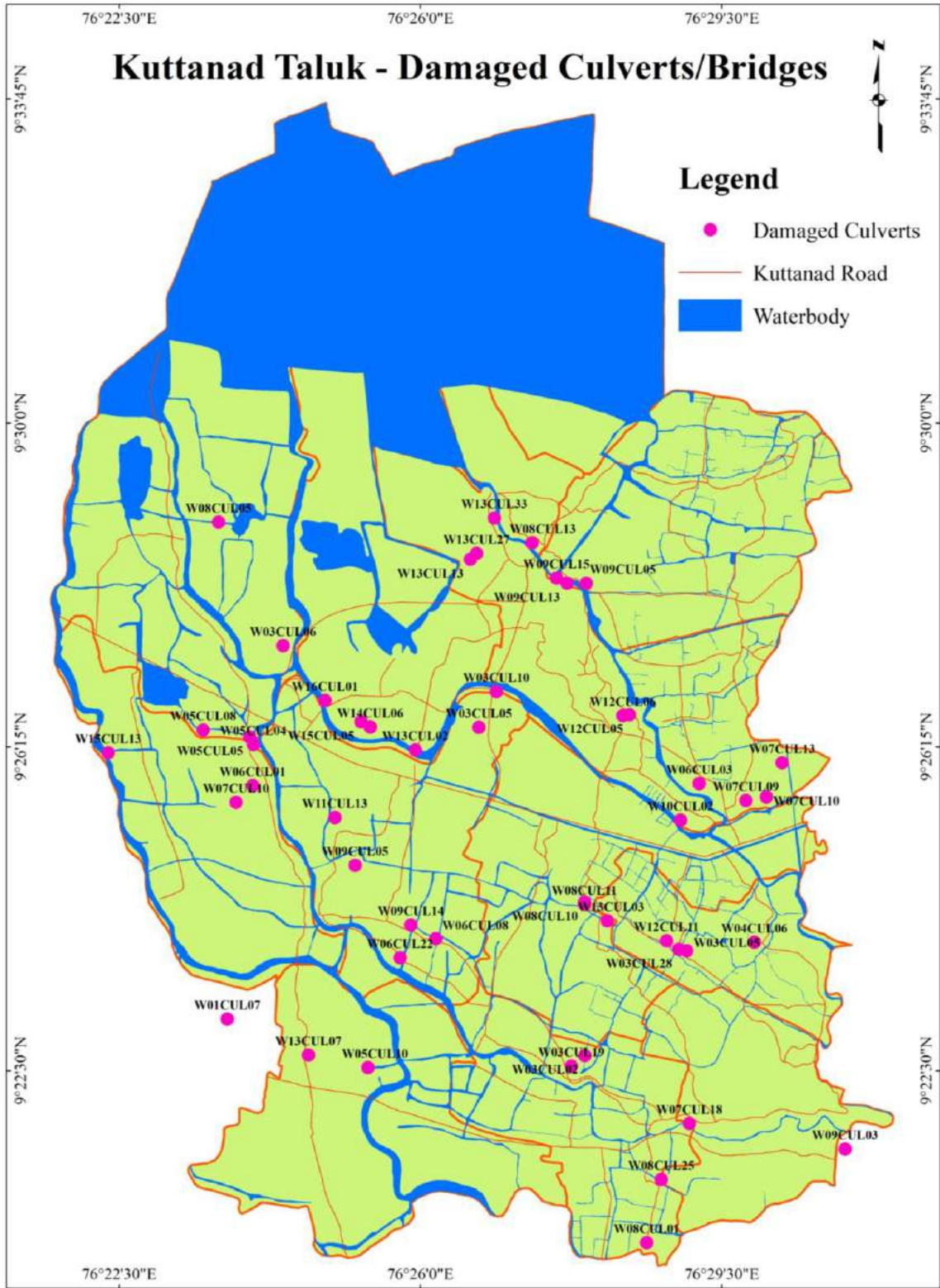


Figure 13: Damaged Culverts/Bridges in the Kuttanad Taluk

3. GRUEL CENTRES

TISS team came across a large number effectively of functioning Gruel Centres in Kuttanad region. The operation of Gruel Centres during the flood season is something unique from a disaster mitigation and preparedness point of view. It can be also considered as a resilient mechanism institutionalized by the communities in the Kuttanad region so as to mitigate disaster impact.

Gruel Centres are community collectives which functioned as a non-residential relief campus during the flood season. The prime objective of the Gruel Centres is to ensure food security of the affected people. Households in a particular habitat are brought together and they to run to these non-residential relief camps. It helps them to manage procurement of food supply and the distribution of cooked food to each household in a decentralized manner. The elected members of Local Government Institutions and Village officers usually take the initiative to bring together households in a particular area. However, the leadership of Gruel Centre rests with community. A Convener for the Gruel Centre is selected in a community meeting.

The number of households associated with gruel Centres can range from 20 households to more than 500 households. There is no ceiling with respect to the number of households that can be a part of particular gruel Centres. The district administration opened 41 gruel centres in Kuttanad, increasing the gruel centres from 201 to 242. As many as 32689 members of 8339 families depended on these centres for food. As stated earlier, the number of gruel centres increased dramatically in the second phase of the floods. TISS team noted that the number of gruel Centres were much more than it was reported. It was noted that these gruel Centres were catering to large number of affected communities. The documents pertaining to the gruel Centres were lost in many village offices during the flood.

Some of the gruel Centres that the TISS team visited have been operational for many decades. It is because Kuttanad, as a wetland, has been witnessing flood regularly for a long period. Some of the gram panchayats located close to river and other water bodies have gruel Centres which operate almost every alternative year. Members from one of the gruel centres in the Muttar Panchayats shared that they are exposed to flood for many years and they have been part of gruel Centres from their childhood. Whenever there is a flood, such community collectives become active. Now these

gruel Centres act as institutionalized mechanism to manage a decentralized non-residential camps or community kitchens. Out of 109 gruel Centres identified by the TISS, only 43 were initiated in the current flood and the rest of them have been operational during previous years during floods.

4. GRUEL CENTRE MANAGEMENT

The table 5 will give an idea of the number of gruel Centres functional in the region –

Panchayat	Number of Gruel Centre
Kainakary	74
Neelamperoor	40
Pulincunnoo	86
Kavalam	82
Veliyanadu	78
Ramankary	80
Champakulam	63
Thakazhy	79
Edathua	91
Muttar	67
Thalavadi	72
Nedumudi	51

Table 5: Number of Gruel Centres that were active during flood situation

Gruel Centres were mostly located on relatively higher level. In Kainakary mostly buildings with 2 floors or public institutions were utilized in ward 3, 4 and 5 for organizing the gruel Centre. Centres located on low lying area between Kaninakary Jetty and the fields in ward 12 were found to be very unhygienic. Ward 6 of Kainakary employed private and public schools, religious organization and private homes to function as gruel Centres. In ward 11 in Neelamperoor, the anganwadi was used as a gruel Centre due to which the regular activities of anganwadi were suspended even though the anganwadi was physically not affected by the flood. In ward 6, the utensils were provided by a religious trust and in ward 13 one of the gruel Centres was supported

by the Rotary Club. In some cases, the families resided in the gruel Centres while in some cases like in ward 6 in Champakulam, people preferred to take their food home with them.

The Convener is the key person responsible for the management of the gruel Centre and is responsible to deal with the district administration primarily the Village Officer to procure financial support. In Ward 9 of Champakulam, the Convener communicated the location of the gruel centre and collected ration cards to procure the material from the issue point. The food material from the issue point was distributed only to the BPL card holders and the AAY card holders. In a gruel Centre in ward 4 of Champakulam, the Convener procured food for 18 families at one of the gruel centres but cooked it for 25 families including those who held white cards also. A similar situation was seen in ward 10 in Neelampeeroor while the Convener in ward 11 refused to give the food to white card holders but the members of the gruel Centres willingly shared their food with them. In the gruel Centre at a church in ward 11 of Champakulam, 40 families with approximately 200 people at a time were supported initially by the local Maveli store and once that area was submerged it had to be procured from Nedumudi which was approximately 3 kms away. This Centre supported a SC colony and although many people left for the relief camps in Alappuzha in the first phase, 6 families stayed behind during the second phase. Besides the support from the administration, private entities like Malayalam Manorama, Matrubhumi also supported gruel Centres by providing materials like bottled water, rice among others.

In ward 8 of Veliyanad a fair number of camps wereset up by the political parties, while the rest were managed by Kudumbasree. Two camps by CPI(M) and one camp by Congress were identified, although, the members in the camps came from diverse political leanings

Functioning of Gruel Centres

The Convener collects the ration card of families who wants to be a part of the particular gruel centre and prepares a list of households attached to thisgruel centre. It includes listing of adult members and children in each family. The Convener submits the list to the Village Officer along with ration cards of each household. The village officer verifies the list, makes the budget and prepares an indent. The government allocates Rs. 40 for an adult member and Rs 30 for minor. The Convener collects it from village office and submits it to the Maveli Store outlets. Such indents are usually issued for two days. This is partly because of limited storage facilities. In the absence

of storage facility, there is possibility that food grains and other food items may deteriorate leading to possibility of health issues.

Depending on the geographical area, the availability of resources, accessibility of resources, the socio-economic indicators, we noticed a wide range of variation in the actual functioning of gruel camps in Kuttanad. It was observed throughout that the cost of transportation i.e. the cost of bringing the supplies from the SupplyCo to the respective camps, was exorbitant; a cost that the people incurred during these times. People mostly covered this by pooling different amounts that they could afford. In such a situation, it was the Convener who was the person incharge of collecting the ration cards of all their camp members and getting an indent issued.

However, an alternative system that was followed was that of the Ward member taking initiative to go collect the raw materials for all the camps in his/ her ward and to be incharge of bringing all these items to a common point in the village which was accessible to all the members. From this point he and the different Conveners of the camps would take-up the task of further distribution of these raw materials to the different camps in their areas depending on the needs of each of the camps.

Food Supply Chain to Gruel Centres

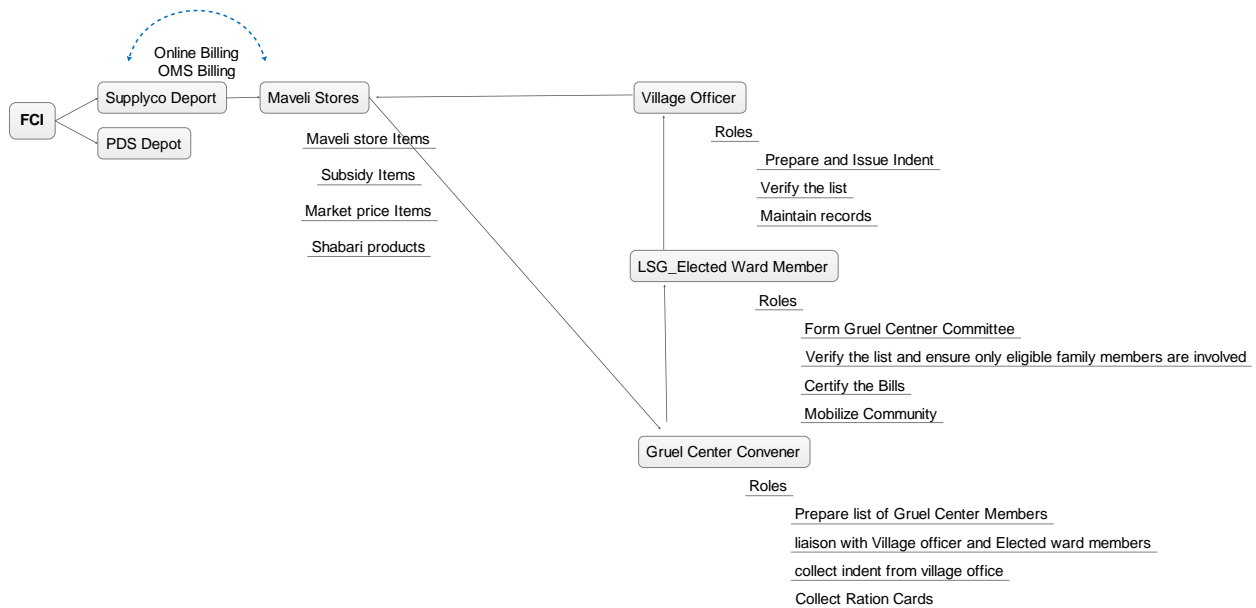


Figure 14: Food supply chain of gruel centres

Apart from the transportation cost, another major overhead cost of managing these camps was the price to be paid for the purchase of firewood or gas cylinder, vegetables and stoves and other big utensils. During this time, the government had not supplied any amount of firewood to the camps and the people had to purchase this from the open market at the cost of 800 rupees per quintal. On the other hand, initiatives taken to supply gas cylinders to these camps were grossly inadequate and inequitably distributed among the different panchayats.

The supply of vegetables from the Horti Corp to the camps was very irregular and insufficient. In some of the Panchayats it was observed that efforts were taken to provide free vegetables in the first phase of the floods. However, this depended on the availability of the vegetables which was inconsistent and it was made available in the subsequent phases of the flood. In addition to this, it was seen that there was no availability of fruits like banana and at the same time the intake of animal proteins like fish and chicken had also gone down.

Some of the Conveners shared that there were many constrains in the functioning of gruel Centres at different stages of flood. Out of 61 gruel centres, Conveners interviewed in the study, 41 of them told that they branched off from the initial gruel Centres. This had implications for the procurement of materials and distribution of the procured stocks to each of the newly formed gruel Centres. Considering the inaccessibility to the initial gruel Centres, there was limited option with elected members to minimize the possibilities of division from the existing gruel Centres. Many of the women Conveners shared that toilet facilities were a serious concern. When people came together in big number for cooking food, the issue of dysfunctional toilet became a pressing concern for women. Privacy was often at stake. In such situation one of the family members was asked to take the cooked food from gruel Centres for rest of the family members at home instead of inviting all members to the place where the gruel Centre was organized.

5. FLOW OF PRODUCTS

Considering food supply requirement of gruel centres as people were cooking rice, sambhar, rasam and avial primarily, rice, dal, vegetables, fuel, firewood, milk, spices, oils etc. were to be provided as per the government authorities. People were mainly cooking two meals- lunch and dinner. Majority did not have breakfast as raw material was not available. In few places rava for upma was provided but in very less quantity compared to the number of people and in less frequency.

Maveli stores were the main source of supply to gruel Centres which received their supply from the Thakazhy warehouse and SD college temporary warehouse.

Rice and daal were supplied to gruel centres through the Maveli store. Many different NGOs and private organizations were providing rice and daal. Main source of vegetable supply was private sellers as the Horti Corp outlet was dysfunctional during flood times. As per the district Horti Corp administration, temporary vegetable distribution centres were set up to provide vegetables but very few respondents reported receiving vegetables from the issue point. At the same time, private vegetable sellers in first phase were purchasing vegetables from Alleppey market but in the later phase when water level was quite high, there was no supply of vegetables. In many areas people either purchased vegetables by themselves if available, used whatever available nearby their homes or cooked food without vegetables.

For the purchase of vegetables, firewood and in many places for transportation of raw material from Maveli store, expenses were incurred by communities and there was no direct financial arrangement made available to them. The expenditure was collectively financed by households that were part of gruel Centres. Instead of direct cash, vouchers were provided to purchase raw material from Maveli stores. When the Maveli Stores were submerged, access to the affected regions were limited and certain points were identified as issue points where food material was made available. With the help of the Village Officer, these new points were communicated to the gruel Centres and the people would then come to these issue points to collect the material. In Kainakary besides relying on material from Alapuzha food material was available at Ponjikora while for ward 7 & 8 it was St. Mary's School and for ward 12 in Ramankaryit was the Gurumandiram bridge.

From FCI to Alleppey warehouse material was supplied through trains and lorries. From there, it went to ration shop and Maveli stores through lorries. From Maveli stores, food supplies were taken by vehicles and boats where no financial assistance was provided by the government to bear transportation cost. Firewood was not provided by government and people had to purchase it from those who had stocks. People also collected firewood from the surrounding and sometimes received it from cooperative neighbors. Revenue department made available gas cylinders available to gruel centres which were distributed sporadically during some period but not to all and in all phases of the flood.

Animal camps received fodder from Milma and were managed by Veterinary department with the help of Veterinary hospital staff. Local availability of milk was very negligible. In Kainakary Ward 1 all the cattle were washed away during floods, except one goat, hence no animal camps were needed.

6. AVAILABILITY OF WATER, FOOD MATERIAL AND FUEL

Vegetables – In ward 8 at Kavalam and ward 10 & 11 in Neelamperoor it was seen that there was no regular supply of vegetables or kerosene. Some relief kits were the only possible source of providing these two materials in this ward. Ward 9 in Neelamperoor vegetables were obtained from Horti Corp, Changanassery. Ward 10 & 11 in Neelamperoor the vegetables used were either grown on the people's land or were bought from the local markets as in the case of ward 4, but in ward 6 the vegetables were coming from the Horti Corp every 3 days and in Changanacherry, the transport cost for which was 350 rupees per trip.

Water – Clean water was supplied by the local panchayat. In some cases, like ward 10 of Kavalam which was surrounded with water carrying clean water in containers was a challenge. In Ward 10 & 11 of Nedumudidrinking water bottles were supplied by the panchayat while water for cooking and other purposes were used for municipal water connections. In ward 10 & 11 in Neelamperoor the rainwater harvesting system was popular which was used for drinking and cooking during the floods. There was a lot of uncertainty about the quality of water therefore many preferred relying on private entities for water supply. Panchayat water relying on a nearby public RO plant provided drinking water which was distributed by boats. Many areas didnot receive drinking water and had to purchase it. Also, people were using well water after boiling it which they don't do in normal times. It was observed that there were multiple sources from where drinking water was collected in different camps, including bottled water supplied by several voluntary organizations, tanks from the panchayat office, collecting and boiling rainwater, and other private water dealers. Even though enough water was available, the chances of contamination were high in many instances. There were a number of complaints by villagers who stated that in the third phase there were instances where the panchayat did not issue them an indent and instead stated that they would reimburse all expenses incurred in the post flood phase. Yet, this money was still to be reimbursed into the accounts of people who had incurred these expenses.

Fuel – In ward 10 & 11 of Nedumudi people rented stoves and gas cylinders for cooking. Some of the gruel centres in the ward 2 used gas stoves to cook food, as the firewood got wet. Each gas cylinder was obtained at a price of Rs. 1000. Most camps used about 5 cylinders on an average. Wood costs around Rs 700 per quintal and the cost of transportation was also higher. Most of the camps spent around Rs 20,000 for wood, while the camps which used gas could save around Rs. 15,000 for the entire period. In Pullinkullu firewood had to be procured from Chennashiri and Alleppey at the rate of Rs. ₹700 per quintal. In ward 5 & 6 in Ramankary, even after receiving gas cylinders from Kuttanad gas agency, the gas stoves could not be used due to windy conditions.

Milk - In Neelamperoor panchayat, dairy farmers collected milk even though animals were kept in cattle camps. They had to supply it to Dairy Development Society (DDS) collection centre. Some of farmers carried milk cans on their heads and walked through flooded routes to supply milk to DDS. DDS, in turn, distributed milk to people in the initial phase of the floods but it was subsequently stalled. Dairy development societies were sending milk to Milma through boats and vehicles based on the accessibility and availability of transportation.

Cereals –In many places as the floods started the Maveli stores became the only source of providing the food material. The challenge increased when some of the Maveli stores were submerged forcing people to travel far to procure the food material. In ward 2 Pullinkullu, no food was supplied to the people who stayed back to take care of animals and they were then only dependent on cattle milk for their survival.

7. STORAGE

The storage house or warehouse is one of the critical stages of supply chain management which acts as a point of collection of the products before it is distributed to the subsequent recipient. It became a crucial point in the flood affected areas. The emergency supplies of food, water, flood kits, etc. are an essential supply during the disasters. Tons of food to meet the requirements was bought through different transportation means like railways or lorry. The Sanatana Dharma (SD) College became a temporary warehouse set by district authorities in Allapuzha district during the floods. The lay out and operations associated with raw materials distribution and utilization of the products for the flow of food items was done at the warehouse by the district administration.

Considering the different storage options available for the food material with the community the storage system at the gruel Centres will have to be considered. In most of the cases the material

had to be procured every alternate day from the issue point by the Convener of the GC. Many gruel Centres therefore did not bother about storing the food as it was seen in Ward 11 of Champakulam. While some emergency set up was created at the house of a MLA to cater to the material required by ward 12 & 13 in Champakulam. The major challenge for storage was seen in the ration shops across the taluk. In ward 10 of Kainakary 85 sacks of rice and 16 sacks of wheat were destroyed in floods while the ration shop in ward 6 of Champakulam lost 20 sacs. The ration shop in ward 12 in Neelamperoor was able to save some material by transporting it to a higher area but was not able to protect it there for long. Some of the food material left over and the new supply had no takers as the region had received enough rice in the relief kit, when they left the relief camps in Alapuzha. Besides the ration shops, anganwadis were also severely affected. Although most of the anganwadis visited during field visit, were found functional, in ward 10 in Kainakary since the utensils and storage facilities, were totally destroyed and were not replaced no food material was being received. In ward 4 & 6 of Neelamperoor the unaffected stock of the ration shop was sold after the water receded but in the anganwadi the stock was recalled back to avoid the possibility of food poisoning. A license holder of Horti Corp shop in ward 9 of Veliyanad stated that they suffered more loss as the warehouses were stocked beyond the regular capacity to meet the high demand during Onam which were all destroyed in the floods.

8. TRANSPORT OF FOOD MATERIAL

During the flood, boats were the main source of transportation for movement of people and raw material to support the working of gruel centres run by local communities in severely affected areas of Kainakary, Nedumudi, Champakulam etc. whereas in areas like Kavalam, vehicles were used for transportation as these roads were not submerged as compared to other roads in other areas.

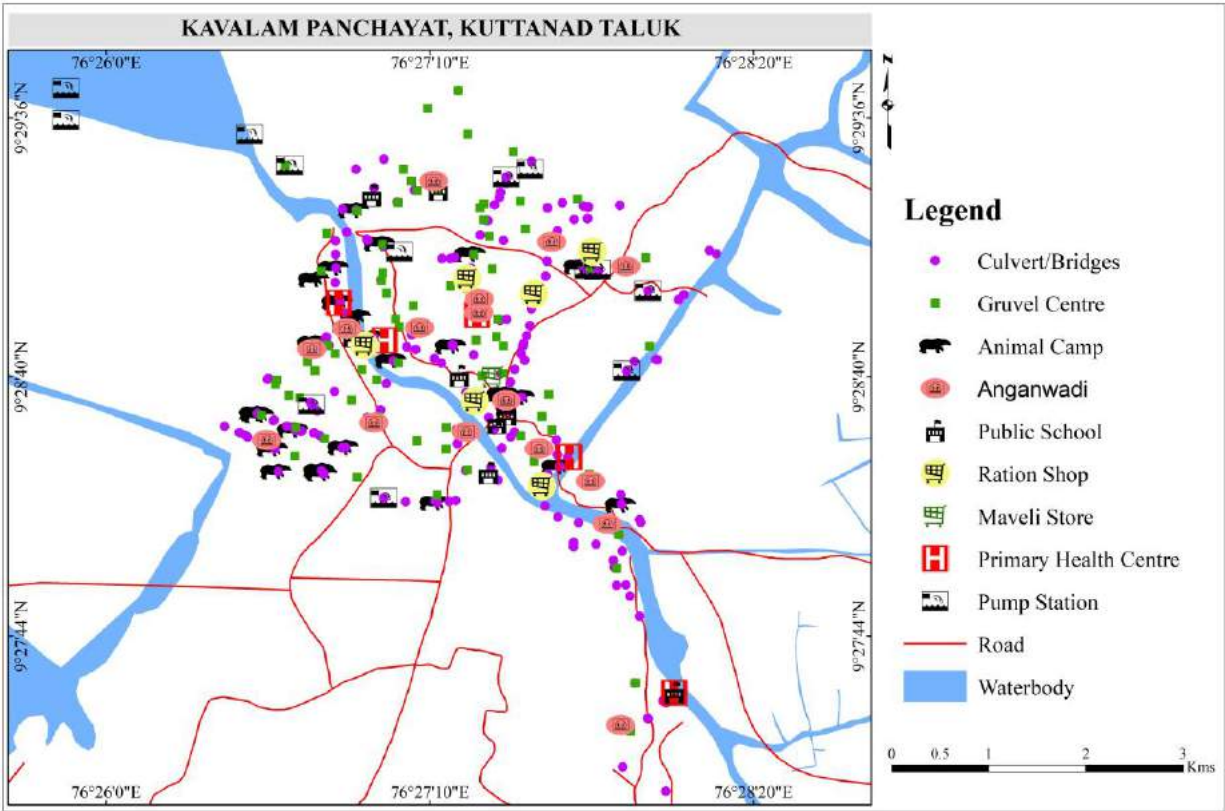


Figure 15: Features captured during the study period, KavalamPanchayat, Kuttanad Taluk

In the interiors, depending upon availability of mode of transportation, people managed to carry material through small boats. In ward 10 in Kainakary the camp collected Rs 50-Rs.100 each from the families to meet the expense for travel and transport, which was not reimbursed by the government. Similar situation was seen in ward 3,4 and 5 where the cost was anywhere between Rs.500 to Rs.1500 and this cost was pooled in by all the members of the camp for three trips in a week. In ward 12 and 13 of Champakulam, ward 10 of Neelamperoor, travel cost varied and were depended on factors like ownership of boats, cost of diesel (for the motors of the boat), proximity to the main road, availability of vehicles, etc. The cost varied from Rs.200 to 800, which was collected from people. While ward 8 in Kovallam was well connected with roads the material was received from the nearest Maveli store. Ward 9 & 10 were surrounded with water and were completely depended on boats for transportation. Ward 7 in Nedumudi although surrounded with water, boats were unable to access parts as the waterway was obstructed by water hyacinth indicating high levels of pollution of the waters. In ward 2 of Ramankary, some people reported that they had to swim for 1.5 hours to reach the Maveli store and procure the raw materials as the availability of boats was limited for the gruel Centre in the St. Mary's Lower Primary School.

A major challenge was observed in ward 9 of Neelamperoor where a small number of gruel Centres were located on the bandhs surrounding paadashekharms. Accessibility to the houses here in normal times is restricted which proved to be a challenge during the floods as well as the entire paadshekham was covered with water and the access was possible only if the bandh was sturdy enough to walk otherwise transportation by boat was the only option. In ward 4 of Neelamperoor the number of the gruel Centres is very low which reduced the amount spent in all for transportation. Further, in Ward 13 of Kovallam although cooking gas was procured from Alapuzzha but it was impossible to carry the heavy item in a boat forcing the gruel Centres to rely on firewood for cooking which was more expensive.

In ward 1 of Pullinkullu as the water level increased, the panchayat members of all the 16 wards hired a very large boat with great capacity and procured materials according to the requirements of each camp and instead of taking it to each camp, unloaded the material at a particular central location from where members from other camps of the panchayat would collect the material and pay a sum for the entire transportation. The entire process led to an expenditure to the tune of Rs 4500 for one trip and its subsequent distribution in Ward 1.

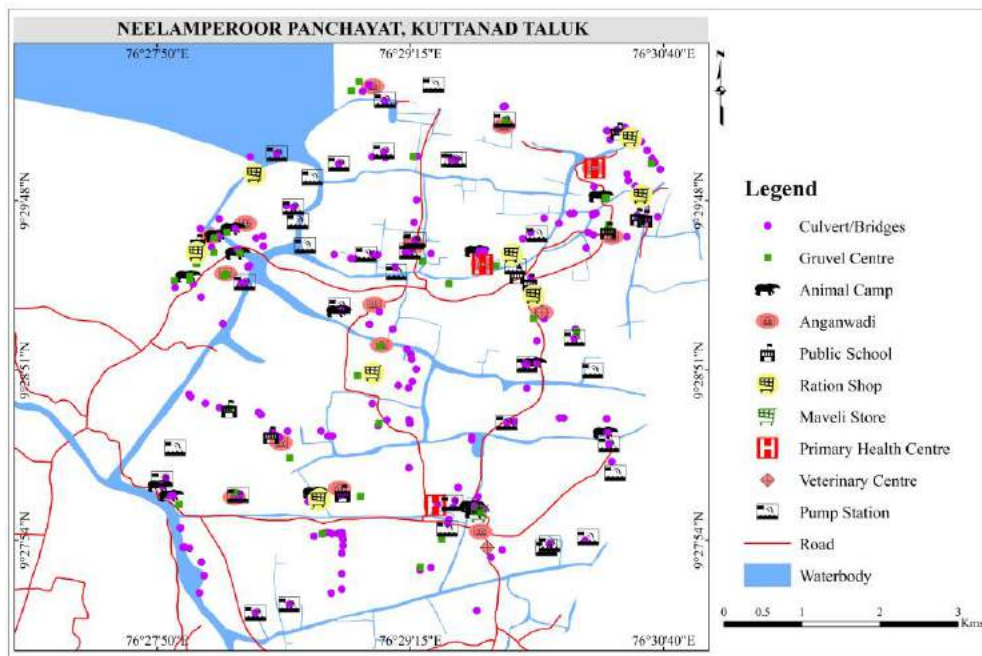


Figure 16: Features captured during the study period, Neelamperoor Panchayat, Kuttanad Taluk

FOOD SECURITY & SUPPLY IN THE FLOOD AFFECTED REGION IN KUTTANAD

The Kuttanad taluk being a low-lying area faces issues of flooding every year. This year the flooding was severe, and many parts of the taluka were under water for a long period of time. Initially very few ration shops and many Maveli stores were able to cater to the demand of food material in the region. The increasing level of water covered the connecting roads to these shops making the supply of the material and its subsequent distribution a very challenging process. By this time most of the people were dependent on the gruel Centres and the community worked together to arrange for the materials. People mostly depended on the distribution of material by the Maveli stores on boats in the initial phase and subsequently on the issue points identified by the district administration. All the gruel camps noted that they received sufficient and, in some cases, more than sufficient, quantities of rice for cooking. Most of the people appreciated the timely availability and quality of rice supplied by the Maveli stores. As the water increased and the supply from Maveli stores became erratic, people became more dependent on the material made available by the district administration.

There was no consistency in the items which were received by the gruel Centres except rice. Many of the people involved indicated that the material was distributed on the basis of first cum first serve basis at the issue point. While this is the general practice, it is essential that there has to be some form of estimation of the amount of material required. In all the panchayats visited, people had to arrange for different means of transportation to access the issue point. Due to rains, quick transportation is not possible. When the materials received were not enough, the gruel Centres had to depend on the outreach of different organizations who were giving out provisions also in an ad hoc manner. It is evident from the observations that the Maveli stores were the focal points for sustaining the affected communities in the gruel Centres. The resilience of the Maveli stores was greater than that of their counterpart primarily the rations shops due to a number of reasons like a greater storage capacity, a diversified transportation system, greater access to main roads and national highways and use of boats for distribution. This ensured that the Maveli store bounced back faster than the ration shops where the major stock was destroyed even though storage facility is available in ration shops. It is extremely critical that Maveli Stores in the region must be strengthened with more resources allocated to the possibility of floating shops. Further, with the

help of the ward level officials, Maveli stores can work towards mapping the water route for their respective wards from the closest Maveli store which can be put together in a centralized map. The mapping will ensure that the respective Maveli stores will be aware about the possible resources required in the region which is dependent on them. The mapping will be helpful for day to day transportation and can be a crucial source for planning response work in floods. It is important to understand that our PDS system needs to be strengthened so that it provides for food material even in the time of crisis. The PDS storage system needs to be re-aligned to ensure that they are sustainable in such circumstances. In the case of Kerala, the robust system of Maveli store became the alternative but in many parts of the country the ration shop is the only point of distribution of food material. It is extremely important that the ration shop and the PDS needs to consider itself as a chief point for relief distribution in times of crisis.

The lack of vegetables, especially in the months of July and August, was a concern shared by most of the camps as by this time even the chanda or the private shops didn't get their usual supply. The demand for vegetables was mostly fulfilled by shopkeeper who were willing to go the extra mile in search of sources where the floods hadn't ruptured the normal supply and then sold them at hiked prices. However, none of these sources were reliable in terms of timely availability of vegetables and as such in extreme stress situations they were not able to equitably deliver vegetables to all the panchayats. Furthermore, in some cases the Convener have stated that vouchers were handed out for buying a quoted amount of vegetables from Horti Corp, but it was given out only in the month of August and that too only once or twice. The availability of vegetables was a critical issue in the region although the officials at Horti Corp maintained that the requirement given by the Village Officer was adequately provided for by them. The biggest challenge in this aspect was the fact that Horti Corp just had the responsibility of delivering the vegetables at the issue point and was not involved in the process of distribution from the issue point which was done on a first cum first serve basis.

Availability of milk was non-existent although towards the more severe part of the floods people relied entirely on their own cattle for milk for sustenance. During the floods, the fodder was available on in Alappuzha and was not transported further due to the failure of their regular means of transportation. People left their cattle either on the culverts or took them to the first floors of some houses. Considering the number of cattle in a ward, the possibility of constructing permanent cattle farms at a higher level with storage space for fodder should be encouraged in the region.

Similarly, the shortage of fuel and cylinders was a major challenge. Although the cylinders were available, transportation of these cylinders via boats was extremely difficult compelling most of the people to rely on firewood. People would collect cylinder from the houses of the camp members themselves or buy in huge quantities from shops, usually at hiked prices, after pooling in money that each member could afford. The cylinder had to be transported from the main supply office in Alapuzha and this created an additional burden of transportation cost for the people and as such making it more economical to use firewood for cooking purposes. The delay or non-delivery of materials like vegetables, milk or fuel indicates that there was no clarity on the amount of material required and the places where the material was required. The possibility of training Ward Members or Kudumbashree workers to map or send information on the presence and demand of a gruel centre to a recognized number or via a mobile application to the district administration could be key in determining the allocation of resources. Where the resources will be allocated only on the basis of a demand created on the application which is shared between the district administration and the Village Officer. Allocating specific handsets or equipment could be helpful and be an opportunity to actually engage the community in disaster preparedness.

Considering the cost of procuring the gas cylinders, fuel and arranging for transportation it is evident that even with the support of the district administration there were financial issues faced by the people. The vouchers issued by the Village Officer catered to the purchases made from the Maveli store and the issue point but the other expenditures such as hiring boats had to be managed by the community itself. In many cases, it was seen that the issue points/Maveli stores would run out of goods, forcing people to buy privately, rendering the vouchers useless. It is therefore crucial to consider the possibility of ensuring that some financial reserve is made available to the ward member or the ASHA worker which can be employed for emergencies such as supporting community activities like transporting materials for the gruel Centres. These resources can be incorporated with the introduction of village level disaster management committees which is extremely essential. Another important task for such a committee could be of identifying the roles and responsibilities of the Village Officer, Ward Members and the Panchayat. Specific training for these three entities in managing and coordinating activities in such emergencies is extremely important. Identification of the roles and responsibilities and communicating it to the people at large will be an important step in ensuring transparency and awareness of the nature of role each entity is expected to perform. The Village officer is expected to provide funds to the gruel Centres

while the Panchayat office has absolutely no idea about the number of the gruel Centres in the region. The ward-members were found to be much more aware and involved, while people in the ward were often not aware about the work of the convener at that point of time. The entire process of providing food material was focused on people who receive food from the PDS system as the material in the gruel Centre was available only to the BPL and AAY card holders. It was the discretion of the convener to share the food material with the white card holder and in some cases the white card holders were not allowed to. The incessant rains and increasing water affected the supply of materials for everyone while the distribution of GC was restricted to only the BPL and AAY card holders. The Convener is then put in a fix to either reduce everyone's shares to provide for the other card holders which included children or refuse to support them at the time of such a grave crisis. Clearly, better systems and guidelines are needed.

There were some challenges of equitable distribution of these raw materials to all camps, especially where caste considerations came in. It was observed that camps located near the SC colonies complained of shortages in availability and access to these raw materials. In areas where people owned private boats, it was seen that the difficulty in reaching the sources of raw material was comparatively less as roads were inaccessible during the floods and even if the roads were open, the prices of transportation had risen considerably during this period. Another factor that affected the availability of resources at the camps was the proximity to road and waterways. It enabled easy procurement of different materials either from the collecting points or from the Maveli stores nearest to them.

As has been observed, culverts are key structures in ensuring connectivity along the waterways and in these floods proved to be an important point for assembly for the gruel Centre, setting up animal camps and point for delivery of materials. As a lot of photos indicate many of the culverts are not safe anymore and have not been repaired for a long time. Especially in remote areas where the culverts are structurally sound to only allow walking, nothing much has been done to repair them. Setting up of gruel camps and animal camps requires that the culverts are constructed at a particular height and can sustain the extra load of a crowd and animals on it. It is extremely important to not only consider bridges and culverts as routes for transportation by road but also as islands of relief in a territory like Kuttanad. Structurally, the culvert, if permitted to be build, should be able to bear the load of massive crowds sometimes 100s in number and animals. Further, the water course under the culvert should be clear to allow the movement of boats used in that region.

Waterways blocked due to low culverts and mass of water hyacinth can be extremely challenging to ensure supply to the last mile. In addition to that, many culverts were actually covered with water. This indicates that a danger mark has to be identified which may be done in consultation with the local people once the water level rises beyond the safety level, it must act as a warning that suggests that the culvert must be abandoned. Culverts cannot just be considered as pathways to cross canals, but they need to plan to consider the connectivity of the water way to the closest highway or motor able road for seamless movement of goods and people. However, this does not mean that more roads need to be built. Unscientific reclamation of wetlands for roads is to be avoided. In many of the panchayats it was observed that houses were built on the borders of padshekharam on the bundhs. During the data collection process many of these padshekharam were still flooded and these bundhs on which the houses were located were between the massive rivers and the flooded padshekharam. In many cases, especially in Kainakary, Neelamperoor and Kavalam, these bundhs were challenging to walk on and reach the houses. Their accessibility was only via water with many of them relying on local boatmen to ferry them around. With the flood waters the bundhs have become fragile structures in many places especially where they have not been cemented requiring immediate scientific attention.

SOCIAL SIGNIFICANCE OF GRUEL CENTRES

Food Security at Household level

The food security at household level is likely to be constrained because of the limited employment opportunities during the flood season. The TISS team noted that most of the families attached to gruel Centres belong to poor socio-economic backgrounds. It was also noted that families from upper and middle income groups prefer to distance themselves from gruel Centres as they view it as a compromise to their social status. Families from many of the upper and middle income groups moved to houses of their relatives in other places that were not affected by the floods.

Alternative to Large Relief campus

Many flood-affected community members who were part of massive residential relief camps and smaller non-residential camps i.e. gruel Centres, shared that they prefer to have community managed gruel Centres. Some of the revenue officials associated with village office and assigned with the responsibility of managing mass relief camps in public building such as schools and community hall listed enormous challenges, they faced in managing relief camps. They also were

of the view that organizing massive relief camps must be the last option. For instance, it was reported that the responsibility of managing relief camps was assigned to the village officer and village assistants. They had limited experience and staff. It was noted that four village office staff had to manage a massive camp of 300-400 households (15 to 20,000 people). It was too much to expect from them.

Secular Space

Some of the gruel Centre organizers shared that when the relief camps are held in community halls belonging to religious and caste communities, some communities hesitate to be a part of such relief camps. In other words, there is a possibility of ‘othering’. Most of the gruel Centre organizers shared that the formation and location of gruel Centres was primarily based on consideration of the habitat and people’s accessibility to the gruel centre. It was rarely based on the any sectarian interest. Finding an elevated place is necessary for cooking. Whenever and wherever possible they identified a particular house to set up kitchen. However, such arrangement was not feasible when all the houses are affected by flooding. It was noted that people used elevated spaces such as bridges and roads. They put up temporary pandals to set up kitchens.

A solution to market failure

Disasters are potential enough to redefine the demand supply of the market equations. It is likely that disaster may generate scarcity of food items in the market. The experience of Kerala flood was not different. It was reported that many shops ran out of stock when people started purchasing food items and started stocking or hoarding. There is a danger that it may create black markets. Food supply made available through the gruel Centre acted as effective mechanism to control the market price of the essential goods and it also ensured a steady supply of food materials in the affected areas.

A life line of food security

As stated above, the availability of food items through market outlets are affected during disasters. It is equally important to take a note that the government institutions and supply systems such as Public Distribution System got dysfunctional. The food security ensured through social support programmes such as mid-day meals at school and anganwadi were affected when they remained closed. It was also noticed that even after the water level receded, many children were yet to return

to the Anganwadi. Apart from that, pregnant women and lactating women found it difficult to make use of support services provided to them by the Anganwadi. In such situation the gruel centres

IMPORTANT QUESTIONS TO BE EXAMINED

Is it a viable and alternative solution?

The gruel Centres were functional in the first and second phases of the flood when the water level was moderate. When the water level increased dramatically during the later stage of the flood i.e. in the middle of August 2018, the district administration asked the people to vacate their houses. Most of the spaces used for gruel Centres were also submerged. In some instances, government evacuated families from their households to a camp far away from their homes. It can be said that the geographical place and communitarian space required for the smooth functioning of gruel Centres are unlikely to be available during a disaster of this scale.

Heterogeneity of gruel centres

The discussion that TISS team had with many gruel centre organizers in terms of its religious and caste community compositions reveals that the Centres was by and large heterogeneous. The data collected from 112 gruel Centre Conveners corroborates the view that gruel Centres were secular and community-oriented in terms of its composition and functioning. However, in a few instances the team did come across gruel centres with a religious and/or caste group. The members in such gruel Centres primarily belonged to a particular religious and/or caste group. Figure 17 indicates that the neighborhood community, elected ward members and village officers played primary role in the formation of gruel centres.

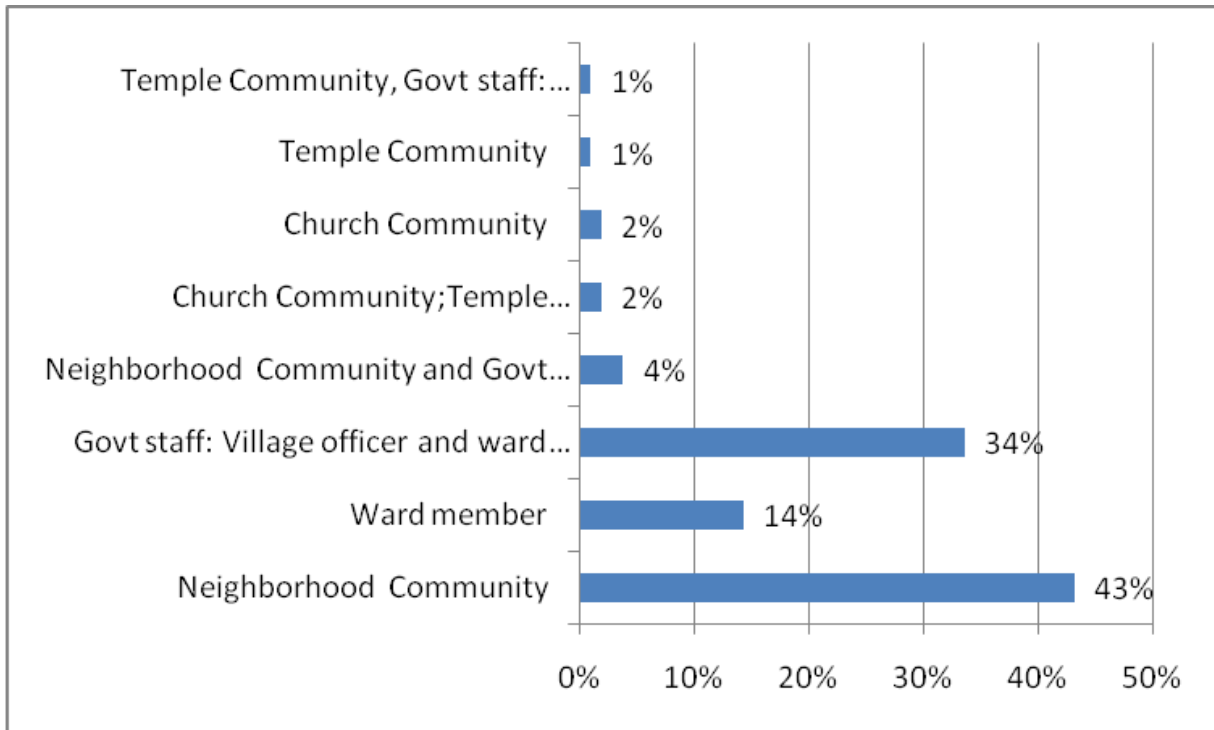


Figure 17: The role of different actors in the formation of Gruel Centres

Decentralization and women’s leadership

Though the district administration takes important decisions such as when to start gruel Centres, the community collective such as Neighborhood Groups (ayalkoottam) and elected ward members played a crucial role in the management of gruel centres. They mobilized people in a location, collected ration cards from each family associated with a particular gruel centre and procured indent from village officers. It was further noted that women played the key leadership role such as Conveners of the gruel Centre committee.

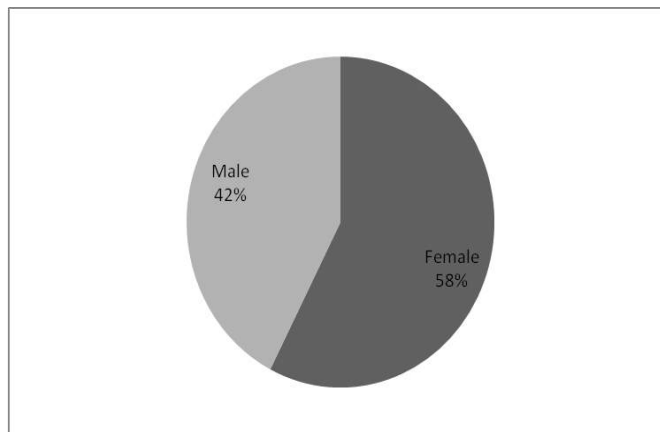


Figure 18: Leadership of Gruel Centre by Gender

Negotiating Trust and Transparency

Some of the ward members shared that they were keen on ensuring that no political party use the relief work as means of advancing their political interests. Thus, some of the ward members tried to persuade people to select socially influential people from their habitat. The trust that people had with their Conveners was instrumental in the smooth functioning of many gruel Centres. The team noted that many of the gruel Centre Conveners were meticulous of maintaining the records such as the indent issued by the village officer and bill obtained from the Maveli store. The TISS team also came across records that provided the details of meetings held by the gruel Centre Conveners and the minutes of these meetings.

However, transparency was a concern for some gruel Centres. As stated earlier, some of the gruel Centres branched off from the registered gruel centre at the village office because of less transparency. Some gruel Centre Conveners expressed that they had to be accountable to the members and the village office. The delay in timely procurement invited criticism from the members of the gruel centres. Some also shared that too much vigilance on their work was sometimes de-motivating.

Key Lessons for future disaster management

The insights that the TISS team has gained from the field engagement with various actors such as people affected by the flood, the functionaries of local self-governance, and government officials engaged in the disaster management operation are worth to consider for disaster mitigation efforts. It is again evident that people's participation in the rescue and relief operation has both intrinsic and instrumental values. The intrinsic value is that local people take the efforts to manage the disaster that they encounter. It is in a way reaffirming the agency of the people who are affected by a disaster. The tendency to project disaster affected people as the 'victim' who are highly depended on external agency for rescue and recovery process needs to be reexamined. Network of gruel Centres exists in the region can play a pivotal role in coordinating the supply of relief materials and to ensure that supports will be reached to people at the margin because of their social, economic, and geographic vulnerabilities.

WAY FORWARD

The work in Alappuzha from October 15, 2018 onwards was a very important learning pedestal for the students and faculty members on the field. It provided the team with opportunity of working closely with flood affected communities and to understand the supply chain of the most critical item during disasters - food. The engagement with the community exposed the Team to the mitigation strategies employed by the community and the Team intends to work on strengthening these strategies by involving multiple stakeholders in the state with the input from the community.

The team employed simple device like a smartphone to map critical infrastructure in Kuttanad and was able to create a massive database on culverts, gruel camps among others in the region. Based on this data base, the team prepared maps which can be employed to understand the mechanism used by the communities to procure materials for the gruel Centres. The team is working on collating data on the socio-economic vulnerability of the region for a better understanding of the final recipient of the supply chain. Further, a proper analysis of the entitlements under the multiple schemes identified during the field needs to be undertaken to assess the possible avenue of strengthening the existing development schemes in Kerala.

The maps prepared based on the data collected will help develop a proper understating of critical infrastructure in the area. They will play a pivotal role in supporting the analysis by visual representation. The major challenge faced by the team was with regard to identifying the boundaries of the panchayats and the wards. Reliance was placed in most of the places on the maps provided by the panchayats which were in most cases hand drawn and not to scale. Many of the locations covered in the panchayats were still inaccessible as the water had not receded or there was a possibility of snake bites. Most of the ward members were extremely supportive and provided us with critical support to address the communication gap as most of the students did not know Malayalam.

The insights that the TISS team has gained from the field engagement with various actors such as people affected by the flood, the functionaries of local self-governance, and government officials engaged in the disaster management operation help the idea of disaster mitigation efforts. It is again evident that people's participation in the rescue and relief operation has both intrinsic and instrumental values. The intrinsic value is that local people make the efforts to manage the disasters that they encounter. It is, in a way, reaffirming the agency of the people who are affected by a

disaster. The tendency to project disaster affected people as the 'victim' who are highly dependent on external agencies for rescue and recovery process needs to be examined. The network of relief centres that exist in the region can play a pivotal role in coordinating the supply of relief materials and to ensure that support will be reached to people at margin because of their social, economic and geographic vulnerabilities.

ANNEXURES

ANNEXURE 1

NAME OF STUDENTS

Doctoral students (JTSDS)

1. Bikash
2. Shahid

Project Staff (JTSDS)

3. Uma

Masters' students Social Work-I year

4. Aishwarya
5. Akash
6. Annettee
7. Anshu
8. Ashwini
9. Kajal

Masters' students Disaster Management I &II year

10. Allan
11. Anisha
12. Ankur
13. Bragy
14. Gopal
15. Hari
16. Himani
17. Julius
18. Mahesh
19. Naul
20. Prakhar
21. Pranav
22. Pritha
23. Priyanka
24. Rashika

25. Rohit
26. Salew
27. Shikha
28. Sumit
29. Sunanda
30. Taniya
31. Vijendra
32. Vinay

ANNEXURE 2**SCHEDULE**

DATE: 14-10-2018	Arrival at Alapuzzha
	Briefing with Mr. Premji and Dr. ShekharKuriokose (via phone) at Karmasadan, Alapuzzha
DATE: 15-10-2018	Briefing with Mr. Suhas, District Collectorate, Alapuzzha
	Pilot visit to Kainakary Panchayat
PANCHAYAT: KAINAKARY	
DATE :16-10-2018	
WARD	TEAM
1	Mahesh, Anisha, Sunanda,Uma
2	Akash, Ankur, Vinay, Shikha
3,4&5	Annettee, Gopal, Sumit, Vijendra
6	Anshu, Himani, Hari
7&8	Naul, Julius, Rashika
9&11	Prakhar, Priyanka, Taniya
10	Kajal, Pranav, Shahid
12	Ashwini, Pritha, Bragy
13,14&15	Allan, Rohit, Bikash, Salew

PANCHAYAT: NEDUMUDI	
DATE :17-10-2018	
WARD	TEAM
1&4	Mahesh, Aishwarya, Sunanda,Uma
9&12	Akash, Ankur, Vinay, Shikha
15	Annettee, Gopal, Sumit, Vijendra
5&6	Anshu, Himani, Hari
14	Naul, Julius, Rashika
10&11	Prakhar, Priyanka, Taniya
2&3	Kajal, Pranav, Shahid
7&8	Ashwini, Pritha, Bragy, Anisha
13	Allan, Rohit, Bikash, Salew

PANCHAYAT: CHAMPAKULAM	
DATE :19-10-2018	
WARD	TEAM
1	Mahesh, Aishwarya, Sunanda,Uma
6&9(small)	Akash, Ankur, Vinay, Shikha
12&13	Annettee, Gopal, Sumit, Vijendra
9&10(small)	Anshu, Himani, Hari
2&3	Naul, Julius, Rashika
10	Prakhar, Priyanka, Taniya
8&7	Kajal, Pranav, Shahid
11	Ashwini, Pritha, Bragy, Anisha
4&5	Allan, Rohit, Bikash, Salew

PANCHAYAT: PULINKUNNU	
DATE :20-10-2018	
WARD	TEAM
10&11	Mahesh, Aishwarya, Sunanda,Uma
2&3	Akash, Ankur, Vinay, Shikha
12&16	Annettee, Gopal, Sumit, Vijendra
15	Anshu, Himani, Hari
13&14	Naul, Julius, Rashika
6&7	Prakhar, Priyanka, Taniya
1	Kajal, Pranav, Shahid
8&9	Ashwini, Pritha, Bragy, Anisha
4&5	Allan, Rohit, Bikash, Salew

PANCHAYAT: NEELAMPEROOR	
DATE :21-10-2018	
WARD	TEAM
1&13	Aishwarya, Sunanda,Uma
2&3	Ankur, Vinay, Shikha
4&6	Annettee, Gopal, Sumit, Vijendra
5	Anshu, Himani, Hari
7	Naul, Julius, Rashika
8	Prakhar, Priyanka,Mahesh, Shahid
9	Kajal, Pranav, Taniya, Akash
12	Ashwini, Pritha, Bragy, Anisha
10&11	Allan, Rohit, Bikash, Salew

PANCHAYAT: KAVALAM	
DATE :22-10-2018	
WARD	TEAM
13	Aishwarya, Sunanda,Uma, Shahid
4	Vijendra, Vinay, Shikha
2&3	Annettee, Gopal, Sumit, Ankur
1&5	Anshu, Himani, Hari
8	Naul, Julius, Rashika
7	Prakhar, Priyanka,Mahesh
11&12	Kajal, Pranav, Taniya, Akash
9&10	Ashwini, Pritha, Bragy, Anisha
6	Allan, Rohit, Bikash, Salew

PANCHAYAT: RAMANKARY	
DATE :23-10-2018	
WARD	TEAM
5	Aishwarya, Sunanda,Uma, Shahid
10&9	Vijendra, Vinay, Shikha
4	Annettee, Gopal, Sumit, Ankur
2	Anshu, Himani, Hari
3	Naul, Julius, Rashika
1&11	Prakhar, Priyanka,Mahesh
12&6	Kajal, Pranav, Taniya, Akash
7&8	Ashwini, Pritha, Bragy, Anisha
11&13	Allan, Rohit, Bikash, Salew

PANCHAYAT: VELIYANADU	
DATE :24-10-2018	
WARD	TEAM
10&11	Aishwarya, Sunanda,Uma, Shahid
6	Vijendra, Vinay, Shikha
3	Annettee, Gopal, Sumit, Ankur
12&13	Anshu, Himani, Hari
7	Naul, Julius, Rashika
5	Prakhar, Priyanka,Mahesh
8&9	Kajal, Pranav, Taniya, Akash
4	Ashwini, Pritha, Bragy, Anisha
1&2	Allan, Rohit, Bikash, Salew

PANCHAYAT: MUTTAR & THALAVADY		
DATE :25-10-2018		
MUTTAR	THALAVADY	TEAM
3	2&3	Aishwarya, Sunanda,Uma, Shahid
9	10&11	Vijendra, Vinay, Shikha
5&6	6	Annettee, Gopal, Sumit, Ankur
4	4	Anshu, Himani, Hari
12	14&15	Naul, Julius, Rashika
8	8&9	Prakhar, Priyanka,Mahesh
10&11	12&13	Kajal, Pranav, Taniya, Akash
7	5&7	Ashwini, Pritha, Bragy, Anisha
1&2	1	Allan, Rohit, Bikash, Salew

PANCHAYAT: EDATHUA	
DATE :26-10-2018	
WARD	TEAM
9&10	Aishwarya, Sunanda,Uma, Shahid
4	Vijendra, Vinay, Shikha
2	Annettee, Gopal, Sumit, Ankur
7&8	Anshu, Himani, Hari
11&12	Naul, Julius, Rashika
1&15	Prakhar, Priyanka,Mahesh
5&6	Kajal, Pranav, Taniya, Akash
3	Ashwini, Pritha, Bragy, Anisha
13&14	Allan, Rohit, Bikash, Salew

PANCHAYAT: THAKAZHY & THALAVADY		
DATE :27-10-2018		
THAKAZHY	THALAVADY	TEAM
11&12		Sunanda,Uma, Shahid
	4&14	Annettee, Sumit, Ankur
8&9		Anshu, Himani, Hari
	9&6	Naul, Julius, Rashika
1&2		Prakhar, Mahesh
7&10		Kajal, Pranav, Taniya
3&4		Bragy, Gopal, Ashwini
5&6		Allan, Bikash,
	15&13	Salew,Vijendra, Aishwarya
13&14		Priyanka, Akash, Shikha
DATE: 28-10-2018	Compilation and tabulation of data	
DATE: 29-10-2018		
DATE: 30:10-2018	Meeting with Mr. Suhas, Collectorate, Alapuzzha	

ANNEXURE 3

GRAM PANCHAYATS AND WARDS IN KUTTANAAD AREA

S. No.	PANCHAYAT	NO. OF WARDS	BLOCK NAME
1	Kainakary	15	Champakulam
2	Neelamperoor	13	Veliyanad
3	Pulicunnoo	16	Veliyanad
4	Kavalam	13	Veliyanad
5	Veliyanad	13	Veliyanad
6	Ramankary	13	Veliyanad
7	Champakulam	13	Champakulam
8	Thakazhy	14	Champakulam
9	Edathua	15	Champakulam
10	Muttar	13	Veliyanad
12	Thalavadi	15	Champakulam
13	Nedumudi	15	Champakulam
	TOTAL NO. OF WARDS	168	

ANNEXURE 4

DETAILS OF DAMAGED CULVERTS/BRIDGES

PANCHAYATH	NAME	LONGITUDE	LATITUDE	DETAILS
Champakulam	W03CUL05	76.44467799	9.44126096	Damaged
Champakulam	W03CUL10	76.448057	9.448109	Damaged
Champakulam	W06CUL08	76.43630312	9.40043641	Damaged bridge
Champakulam	W06CUL22	76.42939563	9.39676495	Damaged pipe culvert
Champakulam	W09CUL05	76.42073818	9.41461156	Damaged
Champakulam	W09CUL14	76.43152139	9.40311933	Damaged
Champakulam	W11CUL13	76.41681377	9.4238119	Damaged iron concrete slab.
Edathua	W03CUL02	76.46519091	9.37790964	Damaged bridge
Edathua	W03CUL19	76.46256554	9.37586054	Damaged culvert
Edathua	W07CUL18	76.48542464	9.36480501	Damaged bridge
Edathua	W08CUL01	76.477137	9.341803	Damaged culvert
Edathua	W08CUL25	76.48001022	9.35399546	Totally damaged
Kainakary	W08CUL05	76.394266	9.480838	Medium culvert, damaged
Kavalam	W09CUL05	76.46546	9.469046	Damaged bridge, boat can pass
Kavalam	W09CUL13	76.461718	9.469027	Partially damaged concrete bridge, boat can pass
Kavalam	W09CUL15	76.459709	9.470033	Partially damaged concrete culvert
Kavalam	W13CUL13	76.44301492	9.47364693	Concrete, partially damaged
Kavalam	W13CUL33	76.447659	9.48164	Concrete, partially damaged
Kavalam	W08CUL13	76.45494496	9.47683655	Bridge broken
Kavalam	W13CUL27	76.444207	9.474825	Broken iron culvert
Muttar	W03CUL05	76.48492504	9.3981348	Damaged mud culvert
Muttar	W03CUL28	76.483406	9.398394	Damaged Bridge
Muttar	W04CUL06	76.49801469	9.39975539	Damaged bridge
Muttar	W12CUL11	76.48098297	9.4000718	Damaged bridge
Muttar	W13CUL03	76.46951439	9.40389144	Damaged bridge
Nedumudi	W03CUL06	76.40675337	9.45697578	Damaged culvert
Nedumudi	W05CUL04	76.40102141	9.43788271	Damaged culvert
Nedumudi	W05CUL05	76.400329	9.439384	Damaged bridge
Nedumudi	W05CUL08	76.39130956	9.44074674	Damaged bridge
Nedumudi	W06CUL01	76.40086655	9.42999286	Partially damaged
Nedumudi	W07CUL10	76.397648	9.426764	Damaged Concrete bridge
Nedumudi	W15CUL13	76.372932	9.436347	Damaged bridge
Pulincunnoo	W13CUL02	76.432354	9.436891	Culvert damaged, but working
Pulincunnoo	W15CUL05	76.421822	9.442337	Damaged, large boats can pass
Pulincunnoo	W16CUL01	76.414884	9.446453	Damaged culvert

Pulincunnoo	W14CUL06	76.42365	9.441292	Culvert Broken, not used
Ramankary	W08CUL10	76.465148	9.407506	Concrete bridge, partially damaged
Ramankary	W08CUL11	76.465114	9.407077	Concrete bridge, partially damaged
Takazhy	W01CUL07	76.395997	9.384967	Damaged Bridge
Takazhy	W05CUL10	76.4232255	9.37560661	Damaged Foot Bridge
Takazhy	W13CUL07	76.411705	9.378032	Damaged Foot Bridge
Thalavadi	W09CUL03	76.5156	9.359901	Culvert damaged
Veliyanadu	W06CUL03	76.48734	9.430378	Damage culvert, not operational
Veliyanadu	W07CUL10	76.500354	9.427793	Culvert damaged
Veliyanadu	W07CUL13	76.50338	9.434378	Culvert damaged
Veliyanadu	W12CUL05	76.473839	9.443668	Damaged, boats can't pass
Veliyanadu	W12CUL06	76.472531	9.443514	Damaged, boats can't pass
Veliyanadu	W07CUL09	76.496354	9.427131	Culvert broken
Veliyanadu	W10CUL02	76.483733	9.423325	Broken, not motorable



TATA INSTITUTE OF SOCIAL SCIENCES
V.N. Purav Marg, Deonar, Mumbai
400088
Telephone: 91-22-2552 5000
Fax: 91-22-2552 5050