

DISTRICT DISASTER MANAGEMENT PLAN SOUTH GOA 2022

INTRODUCTION

There are several natural disasters occurring throughout the world round the year and causing huge loss to the lives, property and natural resources. Assessment of damage caused by these disasters needs to be carried out accurately in minimum possible time frame. Space technology is one of the best suited means for the assessment of damage brought about by natural disaster.

Almost all the countries in the world are prone to one or more forms of disaster viz. earthquakes, cyclones, volcanic eruptions, drought, landslides, flood etc. India is among several countries in the world that faces multiple facets of such disaster almost every year. The region, facing floods during monsoon is often subjected to severe drought during lean season which makes directly or indirectly affect the economy of the Country either in the form of Natural resources, lives, property or infrastructures such as houses, roads, railways, pipelines, electricity and telecom network.

Government's Role:

- Direct post-disaster assistance.
- Partners in public-private insurance.
- Subsidizing risk transfer for poor households and businesses.
- Avoiding “moral hazard”

Main object is to locate flood incidence and to provide timely information about inundation extent on operational basis to the disaster management agencies so as to assist them in making realistic assessment of the affected areas and in organizing systematic relief operations amongst the affected people.

The key elements in this task are:

- a) Planning satellite data selection and acquisition;
- b) Analysis and output generation;
- c) Dissemination and
- d) Timeliness of the whole operation.

Flood damage

Several Government Departments and NGOS require realistic assessment of flood damage to provide social and financial relief to the affected population and to provide budget support in their financial accounting.

The flood damage information that can be operationally derived from satellite and aerial remote sensing data a) geographic area affected, b) agricultural crops damages, c) damage to road/rail' network, d) village marooned, e) population affected f) houses damages and g) loss in financial terms.

The key elements in the task:

Satellite/aerial data acquisition strategy

The Satellite coverage charts have to be prepared showing the coverage of different satellites over flood affected area. A constant watch has to be kept on the flood scenario and the satellite data has to be procured. For procuring the satellite data at

peak stage, the flood hydrogen has to be closely observed and the trend of water level has to be studied from the ground reports. If satellite data not available with the required turn-around-time, aerial data acquisition has to be procured. A Digital Cameras and Video cameras is must for this activity.

Unless the information is available to the user in right time the purpose of entire task is lost. The immediate input about the extent of information has to be provided to the user at shortest possible time.

CHAPTER - I

1.1 Disaster :

A disaster occurs when a natural hazard seriously disrupts the functioning of a community, causing widespread human, material or environmental losses that exceed the community's capability to cope without external relief. Thus, a disaster is:

- A serious disruption of the functioning of
- A community or society
- Resulting in widespread human, material, economic or environmental losses
- Caused due to its inability to handle the negative consequences of risks
- By using its capacities

Human actions play a critical role in creating vulnerabilities to natural hazards. In the last decade itself, one billion people were affected by natural disasters and assets worth approximately US\$730 billion were destroyed. In less developed countries, natural disasters tend to have a disproportionate impact, causing much greater losses (in terms of GDP) than in developed ones.

The world is shifting its traditional focus from post-disaster reconstruction towards building a culture of prevention. The important role of disaster mitigation and risk management is the reduction of losses from natural disasters and sustainable development.

Disasters are often classified according to their cause i.e. natural or man made.

(a) Biological disaster

(b) Natural disaster: - Floods, Earthquake, Tsunami, cyclonic, landslide etc.

(c) Man made disaster: - Air crash, Railway accident, Industrial accident, Bomb blasts and other acts of sabotage,

The Indian Sub continent is highly vulnerable to floods, cyclones, drought, earthquakes; tsunami etc. 25 states in country are disaster prone. Out of 443 Districts, 271 districts are disaster prone. 56% of land is vulnerable to earthquakes, 28% to drought, 12% to floods and 8% to cyclones. Although Goa has experienced both natural and man made disaster i.e. Canacona floods in the year 2017 and collapse of Ruby residence building in Canacona Taluka. We have to prepare ourselves to face such disasters. The recent landslide at Dicarpale-Salcete has proved that disaster can occur at any moment and we have to prepare ourselves in that direction Goa falls in seismic Risk zone III which represents moderate risk. Earthquakes are unpredictable and have a low probability of occurrence but if we remain careless and complacent we are only making ourselves vulnerable to the possibility of huge destruction and loss of lives and property and this is something we cannot afford. The coastal zone of Goa has potential for destruction like floods and tsunami. Experts have predicted that tsunami could strike Mumbai and Gujarat coastline in near future and therefore we have to prepare ourselves. Apart from natural disasters, man made disasters are also on rise which includes air crash, railway accident, industrial accident, gas leakage, Bomb blasts and

other acts of sabotage by terrorist and antisocial elements. For hazardous industries the Collectorate has already prepared the off site emergency management plan.

Biological Disasters (BT):

Events in the recent past have shown that the threat of BT is real. 'The arguments advanced to defer consideration of the issues related to bioterrorism have been "without validity" and we cannot delay the development and implementation of strategic plans for coping with civilian bioterrorism'. Reconstructed scenarios in the case of attacks by the more likely BT agents reveal two patterns. In the case of anthrax and botulinum toxin which have high initial effect but no secondary cases, the scenario is similar to chemical attacks. However, when the pathogen used has the ability to set up secondary cases, and probably an epidemic, the scenario is far more complex. The preparation and action have to be tailored appropriately.

Bioweapons are particularly attractive to terrorist groups because of the ease of their production and also their low cost. They have been termed 'the poor man's nuclear bomb' since it is estimated that a large-scale operation, against a civilian population with casualties, may cost about \$2,000 per sq. km with conventional weapons, \$800 with nuclear weapons, \$600 with nerve gas weapons and \$1 with biological weapons. There have been numerous documented attempts at BT. Biological agents are more efficient in terms of coverage per kilogram of payload than any other weapons system. Terrorism by means of weaponised biological agents such as anthrax is no longer a theoretical concept. Anthrax spores can be milled to an unexpectedly fine degree— 100 times smaller than the human strain in size and easily inhaled deep into the lungs. Even the delivery system for weaponised anthrax need not be sophisticated. Accidental release of anthrax bacilli from a bioweapons unit at Sverdlovsk [in the former Union of Soviet Socialist Republics, (USSR)] and an outbreak of salmonellosis in Dallas, Oregon, in 1984 are well known incidents. The postal dissemination of anthrax spores (after 9/11) caused 22 cases, including 5 deaths,

and 'ushered in the transition from table top bioterrorism exercises to real world investigation and response'. The crucial role of well trained, alert health care providers like Larry Bush, the infectious diseases physician from Florida, USA, who diagnosed the first case promptly, is underlined by this outbreak.

Impact of Biological Disasters:

Dispersal experiments have been attempted using non-pathogenic *Bacillus globigii*, which has physical characteristics similar to *Bacillus anthracis*. The variables in dissemination have been worked out and the impact of bioterrorist attacks estimated. The dispersal experiments showed that an attack on the New York subway system would kill at least 10,000 people. WHO studies show that 50 kg dispersal on a population of 500,000 would result in up to 95,000 fatalities and over 125,000 people being incapacitated. Other experiments have also shown similar disastrous outcomes.

In the case of smallpox, the emergence of secondary cases at the rate of 10 times the number of primarily infected subjects, would add to the burden. There would also be a demand for large-scale vaccination from meagre stocks and no ongoing production. Inevitably, epidemics would break out and social chaos would ensue.

The economic impact of BT would be a major burden that could transcend the medical consequences. It has been estimated that the use of a lethal agent like *Bacillus anthracis* would cause losses of \$26.2 billion per 100,000 persons exposed, while a less lethal pathogen, e.g., *Brucella suis* would cause \$477.7 million. The study also shows that a post-attack prophylaxis programme will be cost-effective, thereby justifying expenditure on preparedness measures. The major economic losses that occurred due to the fallout of the 1994 Surat plague epidemic of natural origin is an example of the larger ramifications of BT/BW. A BT attack on agriculture can cause as much economic loss as an attack on human beings. The spread of the *Parthenium hysterophorus* weed, which entered India in the late 1950s along with imported wheat, affected the yield of fodder crops and

became a crop pest. This is an excellent case study on how an inadvertent entry of exotic pests can occur and lead to adverse consequences in the long term. With properly equipped emergency crews, designated meteorological experts to track the movement of airborne particles, stockpiling of prophylactic and therapeutic antibiotics, and a mechanism for going rapidly to emergency mode, the estimated casualties can be reduced to just 5–10% of the normal casualty rates. This analysis succinctly expresses the need for, and value of, a proper response to BT.

1.2 Disasters are a Developmental Problem due to Following Reasons:

- Natural phenomena tend to have greater effects in developing countries than in developed countries.
- Structural factors associated with a low level of development exacerbate disaster's effects.
- The negative impact of natural phenomena on the prospects for long-term development is considerably greater in less developed countries.
- Confronting disaster must be an explicit objective of development strategies.
- Disaster is similar to economic crises "because they cause sharp increases in poverty and slow the pace of human development".
- Costs of natural disaster such as economic, social, environmental, and gender etc. are enormous.
- The challenge for governments is to incorporate disaster risk management into development planning. Disaster risk management must be integrated into development planning decisions.
- Disasters are not a humanitarian issue, but rather one of development.

- Natural disasters have the most severe impact on developing countries, and within those countries, the poor are most seriously affected.

1.3 Costs of Natural Disasters:

Economic:

- Direct costs - physical damage to infrastructure, raw materials, buildings, homes, etc.,
- Indirect costs - loss of earnings, unemployment, loss of productivity due to death, illness and injuries, public finance expenditure.

Social and environmental impacts

- Loss of human life
- Damage to the environment
- Losses of natural habitats
- Destruction of ecosystems.
- Disruption of communities and family life.
- Loss of cultural heritage assets unemployment, and migration.

Gender Issue:

- Disasters tend to have differential impacts on men and women, and gender is an important issue to consider in disaster-related projects.
- The challenge for governments is to incorporate disaster risk management into development planning.

1.4 Who absorbs the Disaster Risks: Four Main Institutions:

- The government or taxpayers (collective loss)
- Family and neighbours.
- Domestic and international donors and lenders.
- Insurance and other risk-transfer arrangements

1.5 New Approach in Disaster Management:

- Post-Disaster reconstruction Vs building a culture of prevention.
- Disaster mitigation and risk management.
- Devastating effects – Development policies

1.6 “National Disaster Strategy” takes into account:

- Physical, social, economic factors.
 - Incorporate key players.
 - Provisions of sufficient resources.
 - Projections in investment policies – Ministry of finance
 - Role of Private Sector
 - Issues of equity concerns and insurance
- The strategy should contain concrete action plans and continual supervision.

FLOODS

Nature of disaster –Floods

Frequency of occurrence- Annually

Time period – July to Sept of the year

Incident commander – Deputy Collector of taluka

1. HISTORICAL ANALYSIS.

Sr. No.	Year	Taluka	Village Panchayats affected	Areas affected	Related river/stream	Dam affecting river flow	Date of onset of flood	Lives lost	No. of houses affected	End of floods	Severity level
SALCETE											
1	2017	Salcete	Paroda	Zuna Bazar and Paroda Bazar	Khushawati River	Selaulim dam	-	01(Prior to 2015)	04	2-3 days approx	high
2			Cuncolim	cuncolim	Cuncolim river	-	-	Nil	04	1 to 2 days	low
3	2018	Salcete	Paroda	Zuna Bazar and Paroda Bazar	Khushawati River	Selaulim dam	-	Nil	04	2-3 days approx	high
4	2019	Salcete	Paroda	Zuna Bazar and Paroda Bazar	Khushawati River	Selaulim dam	-	Nil	04	2-3 days approx	high
5	2020	Salcete	Paroda	Zuna Bazar and Paroda Bazar	Khushawati River	Selaulim dam	-	Nil	04	2-3 days approx	High
6	2021	Salcete	Paroda	Zuna Bazar and Paroda Bazar	Khushawati River	Selaulim dam	-	Nil	04	2-3 days approx	High

MORMUGAO

Sr. No.	Year	Taluka	Village Panchayat s affected	Areas affected	Related river/stream	Dam affecting river flow	Date of onset of flood	Lives lost	No. of houses affected	End of floods	Severity level
1	2017	Mormugao	Nil	Nil	-	-	-	Nil	Nil	Nil	Nil
2	2018		Nil	Nil	-	-	-	Nil	Nil	Nil	Nil
3	2019		Nil	Nil	-	-	-	Nil	Nil	Nil	Nil
4	2020		Nil	Nil	-	-	-	Nil	Nil	Nil	Nil
1	2017		Nil	Nil	-	-	-	Nil	Nil	Nil	Nil

PONDA

1	2017	Ponda	-	-	-	-	-	-	-	-	-
2	2018		-	-	-	-	-	-	-	-	-
3	2019		-	-	-	-	-	-	-	-	-
4	2020		-	-	-	-	-	-	-	-	-
5	2021		Usgao-Ganjam	Sonarbag, Kantor, Godegal, Parsol, Tankwada, Mharvapaz, Tiral, Meditembi, Kerwada, Gonkarwada, Panchwda,	Madai River Khadepar river	No	23/07/2021	Nil	242	24/07/2021	
6			Betora-Nirankal	Saterimol, Zamblimol, Kumbharwada	Madai River	No	23/07/2021	Nil	32	24/07/2021	

				Codar							
7			Betqui-Candola	Bagwada, Wadiwada, Gaonkarwada, Jalmiwada, Kurduwada, Jaidwada	Mandovi river	No	23/07/2021	Nil	30	24/07/2021	
8			Savoi-Verem-Vaghurme	Madakwada, Kawangal, Vaghurme, Kanakwada, Bandwada,	Mandovi river	No	23/07/2021	Nil	66	24/07/2021	
9	2021	Ponda	Volvoi	Sateribhat, Inambhat, Kamatwada, Deulwada, Fondchebhat, Metwada, Haliwada	Madai river	No	23/07/2021	Nil	46	24/07/2021	
10			Curti-Khandepar	Kadsal, Murdi, Gauthan, Nallakond	Khandepar river	No	23/07/2021	Nil	60	24/07/2021	
11			Borim	Near Sakav at Paniwada	-	-	-	-	-	-	
QUEPEM											
1	2017		Nil	Nil	-	-	-	Nil	Nil	Nil	Nil
2	2018		Nil	Nil	-	-	-	Nil	Nil	Nil	Nil
3	2019	Quepem	Nil	Nil	-	-	-	Nil	Nil	Nil	Nil
4	2020		Nil	Nil	-	-	-	Nil	Nil	Nil	Nil
5	2021		Nil	Nil	-	-	-	Nil	Nil	Nil	Nil

SANGUEM

Sr. No.	Year	Taluka	Village Panchayats affected	Areas affected	Related river/stream	Dam affecting river flow	Date of onset of flood	Lives lost	No. of houses affected	End of floods	Severity level
1	2017	Sanguem	-	-	-	-	-	-	-	-	-
2	2018		-	-	-	-	-	-	-	-	-
3	2019		-	-	-	-	-	-	-	-	-
4	2020		-	-	-	-	-	-	-	-	-
5	2021		1) Sanguem Municipality	1) Dando, 2) Nandurlem LIS(Quinamol) Along river bank	Dando Stream	Salaulim Dam	22.07.2021 and early Morning on 23.07.2021	Nil	1	23.07.21 Morning	
6			2) UguemPanchayat	Along river bank	Uguem River		22.07.2021 and early Morning on 23.07.2021	Nil	Nil	23.07.21 Morning	
7			3) Bhati Panchayat	Valshe bridge and along valshe river banks, Potrem&Valkini	Valshe River		22.07.2021 and early Morning on 23.07.2021	Nil	Nil	23.07.21 Morning	
8			4) KalayPanchayat	Khutkarwada, Pimpalquina, Devnamol&Duckerc ond	Kalay River		22.07.2021 and early Morning on 23.07.2021	Nil	Nil	23.07.21 Morning	
9			5) SanvordemPanchayat	Dhadem	Sanvordem River		22.07.2021 and early Morning on 23.07.2021	Nil	Nil	23.07.21 Morning	

CANACONA

Sr. No.	Year	Taluka	Village Panchayats affected	Areas affected	Related river/stream	Dam affecting river flow	Date of onset of flood	Lives lost	No. of houses affected	End of floods	Severity level
1	2017	Canacona	Nil	Nil	-	-	-	Nil	Nil	Nil	Not crossed till date
2	2017		Nil	Nil	-	-	-	Nil	Nil	Nil	
3	2017		Nil	Nil	-	-	-	Nil	Nil	Nil	
4	2017		Nil	Nil	-	-	-	Nil	Nil	Nil	
5	2017		Nil	Nil	-	-	-	Nil	Nil	Nil	

DHARBANDORA

1	2017		Nil	Nil	-	-	-	Nil	Nil	Nil	
2	2018		Nil	Nil	-	-	-	Nil	Nil	Nil	
3	2019		Nil	Nil	-	-	-	Nil	Nil	Nil	
4	2020		Nil	Nil	-	-	-	Nil	Nil	Nil	
5	2021	Dharbandora	V.P. Dharbandora	Daukon, Dhullai, Marad Dharbandora.			23/07/2021				
			V.P. Sancorda	Udhalshem, Malem	River Ragada						
			V.P. Collem	Vashimarad Shigao, Bazarwada Collem, Souzamal Collem, maida Collem, Bharipwada Collem, Gandhi nagar	Dudhsagar River		23/07/2021			23/07/2021	

Sr. No.	Year	Taluka	Village Panchayats affected	Areas affected	Related river/stream	Dam affecting river flow	Date of onset of flood	Lives lost	No. of houses affected	End of floods	Severity level
		Dharbandora		Collem, Matojem Shigao, Turimarad Shigao, Velipwada Shigao, Vakikulan Shigao, Vikaswada Collem, metawada Collem, Pimpalmol Collem, Kimbarmal Collem, Tambdimal Collem, Bimbal Collem, vansaiwada Collem, Caranzal	Dudhsagar River		23/07/2021			23/07/2021	
			V.P. Mollem	Bazarwada Mollem, Bharkhatem Mollem, Kajumal Mollem, Zariwada Mollem, Dhatsangod Mollem,							
			V.P. Kirlapal Dabal	Codli, Baburli Karmane, Karmane Kirlapal, Santone Dabal, Malarima Kirlapal, Vagon Kirlapal,	Dudhsagar River			Nil	338		

2. VULNERABILITY MAPING (HISTORICAL DATA + WRD DEPT.+ MET DEPT.)

Taluka	V.P. Vulnerable	Areas Vulnerable	Households likely to be affected	Expected time of floods	Expected time of Ending	Duration
Salcete						
Salcete	Paroda-Mullem	Zuna Bazar & Paroda Bazar	04	As per weather forecast	-	-
	Cuncolim	Cuncolim	04	As per weather forecast		-
Mormugao						
Mormugao	Nil	Nil	Nil	Nil	Nil	Nil
Ponda						
Ponda	Usgao-Ganjam	Sonarbag, Kantor, Godegal, Parsol, Tankwada, Mharvapaz, Tiral, Meditembi, Kerwada, Gonkarwada, Panchwda.	301	During High Tide	After 48 hours	Two day
	Betora-Nirankal	Saterimol, Zamblimol, Kumbharwada, Codar	57	During High Tide	After 48 hours	Two day
	Betqui-Candola	Bagwada, Wadiwada, Gaonkarwada, Jalmiwada, Kurduwada, Jaidwada	50	During High Tide	After 48 hours	Two day
	Savoi-Verem-Vaghurme	Madakwada, Kawangal, Vaghurme, Kanakwada, Bandwada,	86	During High Tide	After 48 hours	Two day
	Volvoi	Sateribhat, Inambhat, Kamatwada, Deulwada, Fondchebhat, , Metwada, Haliwada	55	During High Tide	After 48 hours	Two day
	Curti-Khandepar	Kadsal, Murdi, Gauthan, Nallakond	62	During High Tide	After 48 hours	Two day

Taluka	V.P. Vulnerable	Areas Vulnerable	Households likely to be affected	Expected time of floods	Expected time of Ending	Duration
	Borim	Near Sakav at Paniwada	-	-	-	-
<u>Quepem</u>						
Quepem	Nil	Nil	Nil	Nil	Nil	Nil
<u>Sanguem</u>						
Sanguem	1) Sanguem Municipality	1) Dando, 2) Nandurle, LIS(Quinamol) Along river bank	One	In the Month of July, Incase of Incessant rains for 2 to 3 days	4 to 5 hrs after rain recedes	4 to 5 Hrs
	2) UguemPanchayat	Along river bank	Nil	In the Month of July, iIncise of Incessant rains for 2 to 3 days	4 to 5 hrs after rain recedes	4 to 5 Hrs
	3) Bhati Panchayat	Valshe bridge and along Valshe river banks, Potrem&Valkini	Nil	In the Month of July, iIncise of Incessant rains for 2 to 3 days	4 to 5 hrs after rain recedes	4 to 5 Hrs
	4) Kalay Panchayat	Khutkarwada, Pimpalquina, Devnamol&Duckercond	Nil	In the Month of July, iIncise of Incessant rains for 2 to 3 days	4 to 5 hrs after rain recedes	4 to 5 Hrs
<u>Canacona</u>						
Canacona	Shristal	Bhatpal&Arthafond	App.10 Nos	July, August, September & October.	12 Hours	3 Days
Canacona	Loliem	Maik, Iddar, Mashem	App.10 Nos	July, August, September &	12 Hours	3 Days

Taluka	V.P. Vulnerable	Areas Vulnerable	Households likely to be affected	Expected time of floods	Expected time of Ending	Duration
				October.		
	Poinguinim	Colsor, Talpana, Galgibag, Sodolxem, Mudkud	App.30 Nos	July, August, September & October.	12 Hours	24 Hours
	Nag-Pal (Municipality)	Kindlem, Margan, Paneyfond	App.15 Nos	July, August, September & October.	12 Hours	24 Hours
<u>Dharbandora</u>						
Dharbandora	V.P Dharbandora	Daukon,	25	In the month of July/ August	July/ August	One day
	V.P. Sacordem	Aglot	25	In the month of July/ August	July/ August	One day

4. MAP OF VULNERABLE AREAS

SALCETE

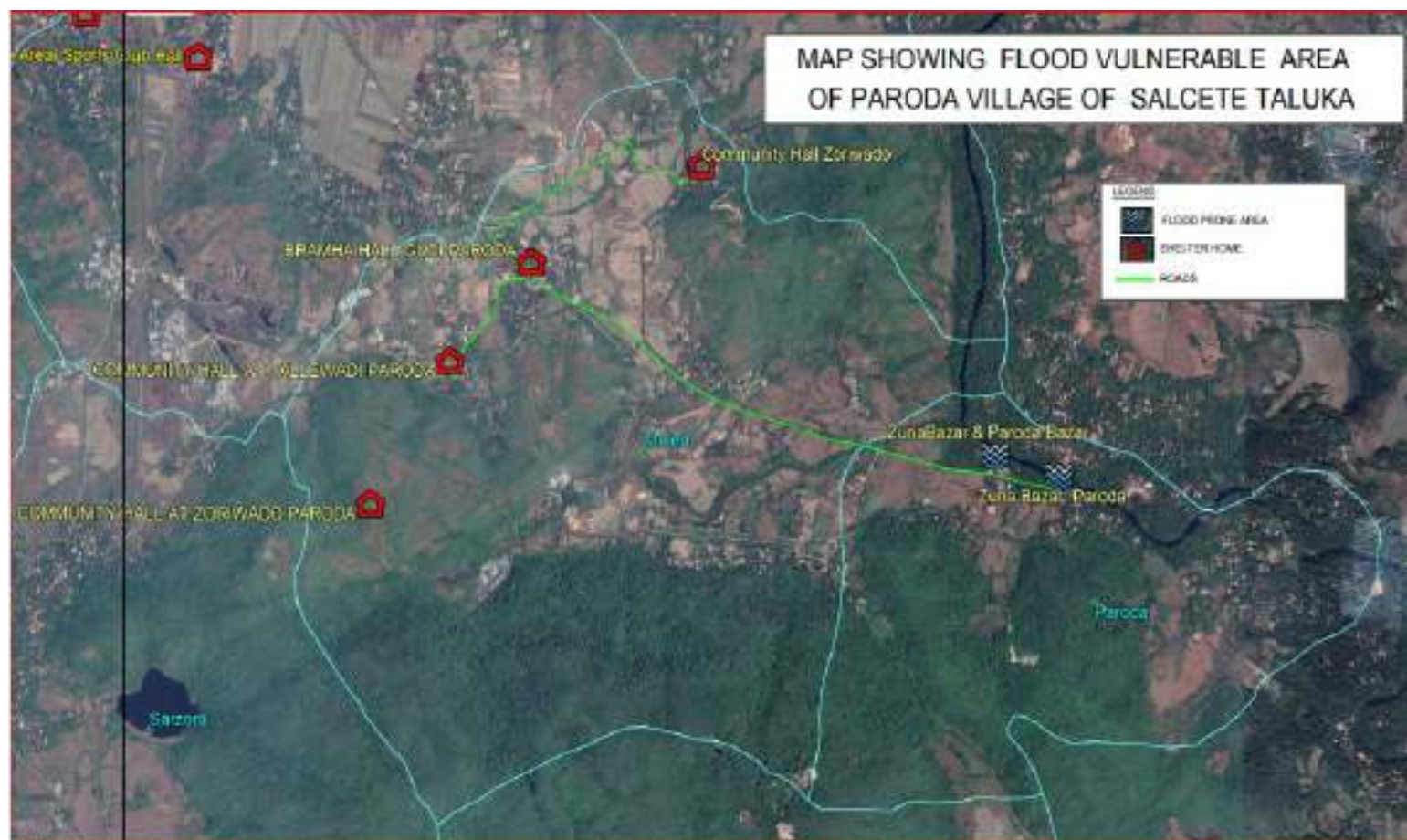


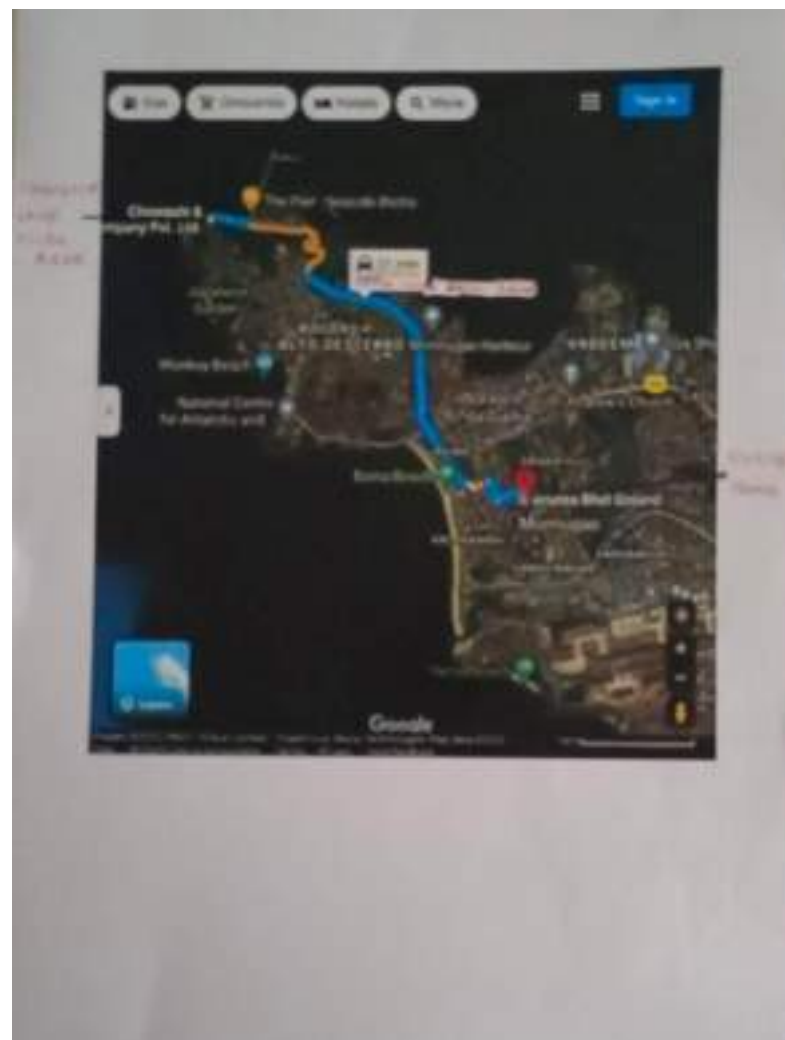
Fig: 1

Map showing flood vulnerable area and shelter homes in Paroda village of Salcete taluka.

SALCETE –



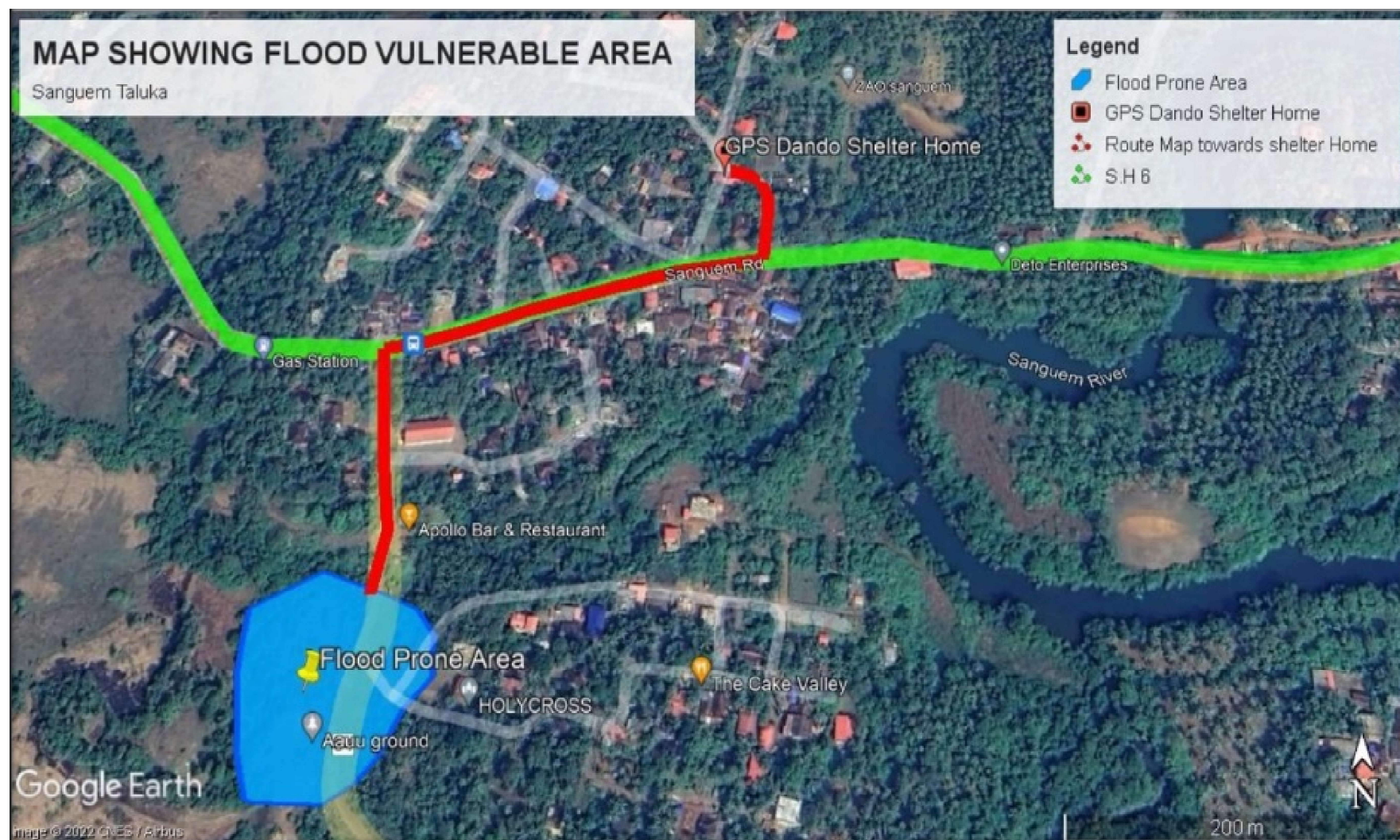
Fig: 1.2 *Map showing flood vulnerable area and shelter homes in Cuncolim village of Salcete taluka.*



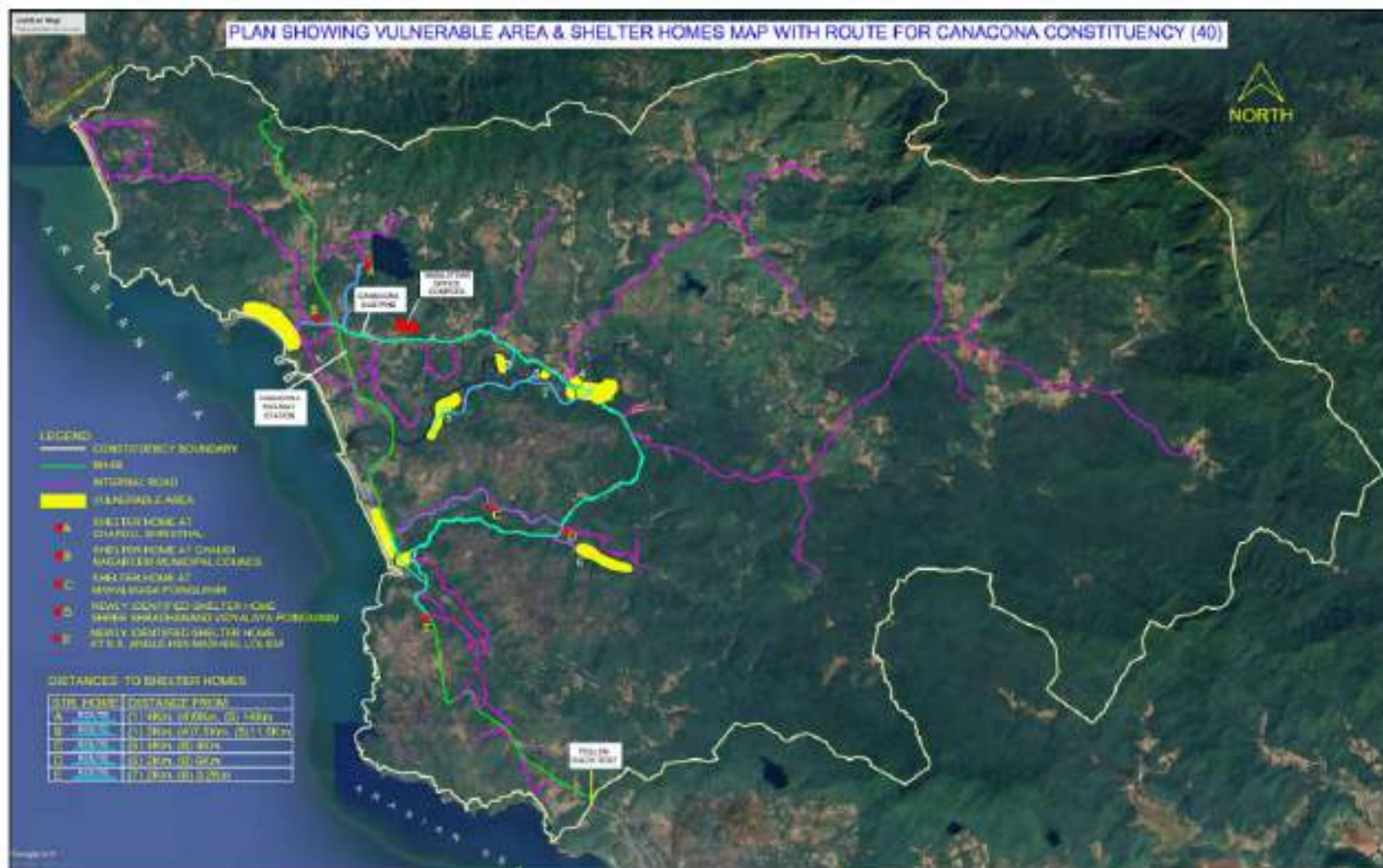




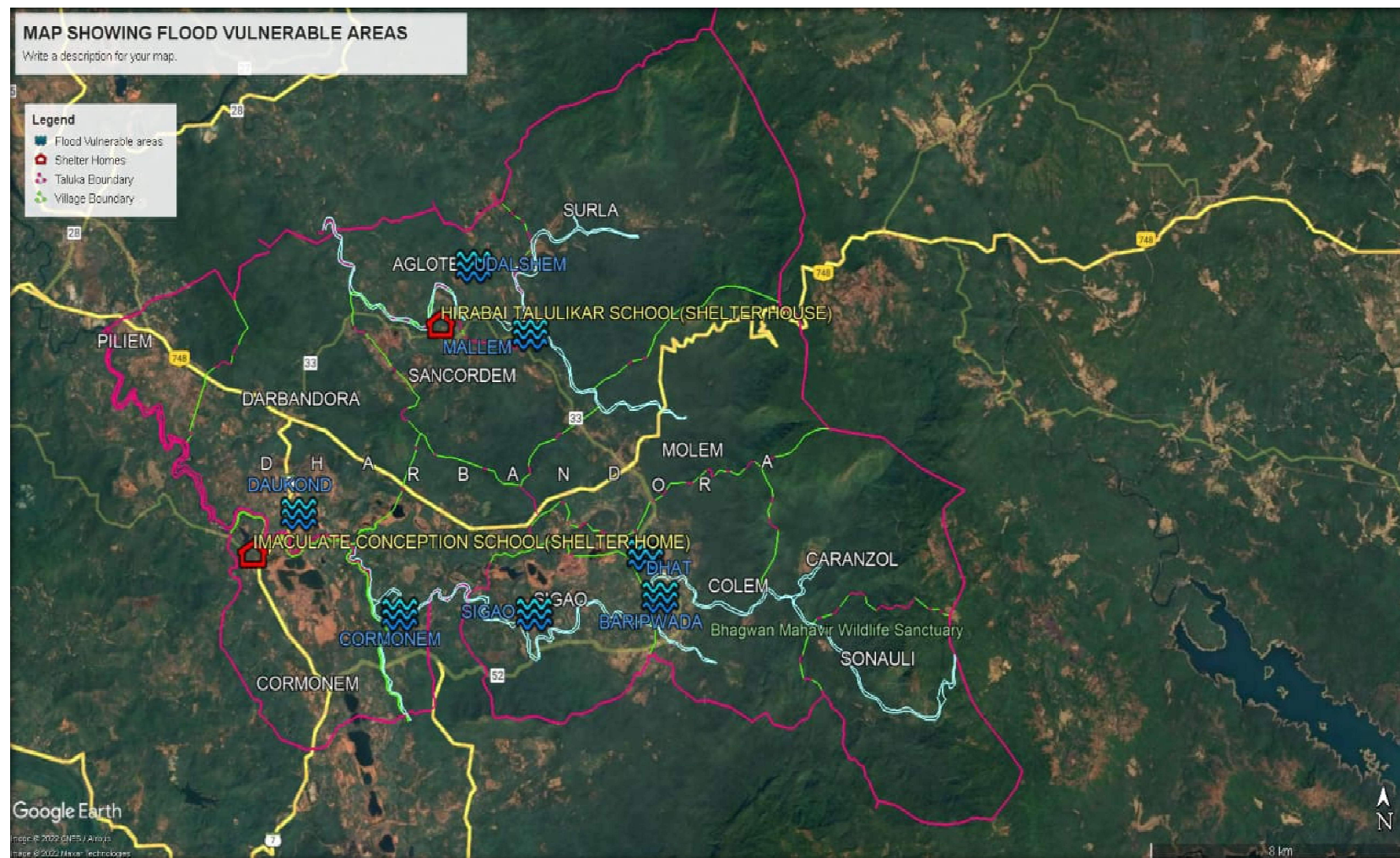
SANGUEM



CANACONA



DHARBANDORA





5.IDENTIFICATION OF SHELTERS- (BY DEPUTY COLLECTORS)

VP vulnerable	Areas vulnerable	Households likely to be affected	Expected time of floods	Identified shelter	Shelter home incharge (preferably from local VP)	Linked SHG for cooked food	Linked PHC
SALCETE							
Paroda-Mullem	Zuna Bazar & Paroda Bazar	04	As per weather forecast	1. Community Hall at Zoriwado 2. Brahma Hall Gudi Paroda 3. Community Hall Tallewadi	Nainesh Gaonkar 9822480784/ 7798673379 Shailesh Borkar 9850427611 9860336114 9822589966	Shree Ganesh SHG Urmilla 9922657078	PHC Quepem
Cuncolim	Cuncolim	04	As per weather forecast	1. GSUDA, Building 2. Municipality Hall 3. Cuncolim Recreational Hall	BalsoDessai 9850536652 --do-- Sandesh Naik 9890223838	1. ShantadurgaMahilaManch Rita Prabhudessai 7517458989 2. SaileeShantadurga SHG Kalpana Naik 7720897857	PHC Balli
Dramapur-Sirlim	-	-	As per weather forecast	1. Panchayat Hall of Dramapur-Sirlim	Sudesh Lotlikar 9226369963	-	PHC Navelim

VP vulnerable	Areas vulnerable	Households likely to be affected	Expected time of floods	Identified shelter	Shelter home incharge (preferably from local VP)	Linked SHG for cooked food	Linked PHC
Sarzora	-	-	As per weather forecast	1. Panchayat Hall of Sarzora	Concy 9823989713	-	PHC Chinchinim
Carmona	-	-	As per weather forecast	1. Sacred Heart of Jesus High School 2. Community Hall of Village Panchayat	Headmistress Amita Gracias 9657959876 Pramila Mascarenhas 9822820351	Village Organisation Women Strength Village Group Lavita Dias 9765664721 1. Perpetual SHG, Lavita Dias 9765664721 2. Sunshine SHG ShimonetaNunes 9822387926 3. Holy Cross Rafia Pereira E Gomes 9552928357 4. Ruchik SHG Betsy Antao 9518720264 5. St. Sebastian SHG	1. Sub-Health Centre 2. Rural Medical Dispensary

VP vulnerable	Areas vulnerable	Households likely to be affected	Expected time of floods	Identified shelter	Shelter home incharge (preferably from local VP)	Linked SHG for cooked food	Linked PHC
						<p>Narcia D Costa 9822484122</p> <p>6. Shublaxmi SHG Saloja Fernandes 9921348271</p> <p>7. Saikrup SHG Diksha Shiroadkar 7020331449</p> <p>8. Mahalaxmi SHG Rima Shiroadkar 8408938644</p> <p>9. Creative SHG Pratima Mascarenhas 923185414</p> <p>10. Mahasantoshi SHG Babita Shiroadkar 7798717216</p> <p>11. Unity SHG Maria Clara Miranda 9822688842</p>	

VP vulnerable	Areas vulnerable	Households likely to be affected	Expected time of floods	Identified shelter	Shelter home incharge (preferably from local VP)	Linked SHG for cooked food	Linked PHC
						12. Firefly SHG Venicia Goerge 9422018878	
Cavelossim	-	-	As per weather forecast	1. Holy Cross Institute School 2. Santacruz Club Hall	1. Anthony Vaz 9922560695 And Headmistress Edilqueen Furtado 9850476980 2. Prince Pereira 9860733178	-	Sub-Health Centre
Orlim	-	-	As per weather forecast	1. V.P. Hall Orlim	1. Tamica D'Silva 9923515780	Rakhumai SHG Vriushali Nagvekar 8805846625	Rural Medical Dispensary
Telaullim	-	-	As per weather forecast	1. V.P. Panchayat Hall, Telaullim	1. Jeanivie D Costa 8975590266	-	PHC Navelim
Seraullim	-	-	As per weather forecast	1. Our Lady of Pillar Church Hall	1. Fr.Benjamin Sacrafamilia 0832 -2780681	1. SHG-Rudra Hanumant Arti 8329552282 2. Omkar SHG SushilaMahamle 7507285857	PHC, Cansualim

VP vulnerable	Areas vulnerable	Households likely to be affected	Expected time of floods	Identified shelter	Shelter home incharge (preferably from local VP)	Linked SHG for cooked food	Linked PHC
Curtorim	-	-	As per weather forecast	1.V.P. Hall Curtorim 2.Govt. Middle School SanduelBhati	-	Union Self Help Group 9822670181	PHC, Curtorim
Varca	-	-	As per weather forecast	1. V.P. Hall Varca 2. GPS Varca School 3. St. Mary High School	1. Duarte Fernandes 9860095305 2. Rekha Kamat 7517534787 3. Pio Headmaster 9763133901	-	Sub Health Centre Varca-PHC Chinchinim
Nagoa	-	-	As per weather forecast	1. V. P. Hall NagoaSant-Bollem	1. Anil Naik 9822143363	1. Sakhi SHG SonakshiLotlekar 9326175195	
				2. Nagoa Citizen Welfare CenterMazilvaddoNagoa	1. Anil Naik 9822143363	2. Samruddhi SHG Rasika Shirodkar 7588484965 3. Swayamsiddha SHG Aliza Fernandes	
Loutulim	-	-	As per weather forecast	1. V. P. Hall Loutulim 2. Saviour of the World High School	-	-	PHC Loutulim

VP vulnerable	Areas vulnerable	House olds likely to be affected	Expected time of floods	Identified shelter	Shelter home incharge (preferably from local VP)	Linked SHG for cooked food	Linked PHC
Camurlim	-	-	As per weather forecast	1. Community Hall Camurlim 2. V. P. Camurlim		1. Mahalaximi SHG 2. St. Francis Xavier SHG 3. Candelaria SHG	PHC Loutulim
Cana-Benaulim	-	-	As per weather forecast	1. Cana Benaulim Panchayat Hall	1. Francisco Fernandes 9850851530	-	PHC Cansaulim
Nuvm	-	-	As per weather forecast	1. Panchayat Hall Nuvm	8007338497	-	PHC Loutolim
Verna	-	-	As per weather forecast	1. Panchayat Hall Verna	9822891254	-	PHC Cortalim
Davorlim-Dicarpali	-	-	As per weather forecast	1. V.P. Davorlim Hall	1. Minguel Carvalho 9158059641	-	PHC Davorlim
Rumdamol	-	-	As per weather forecast	1. V.P. Rumdamol Hall	1. Deepak Naik 9011276076	-	
Raia	-	-	As per weather forecast	1. V.P. Hall Raia	1. Anthony Gaunkar 8975062755	1. Shree Om Sai SHG 2. Sadguri Mauli SHG 3. Shree Samarth Krupa SHG	PHC Loutulim

VP vulnerable	Areas vulnerable	Households likely to be affected	Expected time of floods	Identified shelter	Shelter home incharge (preferably from local VP)	Linked SHG for cooked food	Linked PHC
Rachol	-	-	As per weather forecast	1. Church Hall Rachol	1. Fr. EremitoRebello	Our Lady of Gloria SHG Dulcina Dias	PHC Loutulim
Velim	-	-	As per weather forecast	1.V.P.Hall, Velim 2. SanshrutiBhavan,Baradi 3 .St. francis Xavier Hall 4. St. Rock High School Hall, Tollecanto	1. Savio 8888741060 2. Fr Savio Vaz 9823982767 3. Fr. Santo A Pereira 2773440 4. Fr. Luis 9822382875		
Ambelim	-	-	As per weather forecast	1. V. P Ambelim Hall 2. S. P Hall Ambelim	0832 -2773232 9545873984		PHC, Chinchinim
Navelim	-	-	As per weather forecast	1. V.P. Hall Navelim 2. SanskritiBhavanMandop a	1. BevindaGonsalves 9821688030 2. Paul Pereira 9822167317	SHG MaliniBandekar 9881834600	PHC Navelim

VP vulnerable	Areas vulnerable	Househ olds likely to be affected	Expected time of floods	Identified shelter	Shelter home incharge (preferably from local VP)	Linked SHG for cooked food	Linked PHC
Aquem-Baixo	-	-	As per weather forecast	1. V.P.HallAquemBaixo 2. ITI Firgulle	1.Ramdas Usgaonkar 9325780159	1.SHG Kusum D Gaunkar 9922289247 2. Sunita Naik 9822137668	PHC Navelim
Chinchinim	-	-	As per weather forecast	Mount Mary High School Hall	0832 -2863373	9881497797	PHC, Chinchinim
Assolna	-	-	As per weather forecast	Regina Martyrum High school	1. Fr. Santerio 9822480805		PHC, Chinchinim
Margao	-	-	As per weather forecast	1. Manohar Parrikar Indoor Stadium	1. Conny Miranda 9822481041	1) Sai Shraddha Group 9158490250 2) Amrut Dhara Prassidha Group 9970620845	

VP vulnerable	Areas vulnerable	Households likely to be affected	Expected time of floods	Identified shelter	Shelter home incharge (preferably from local VP)	Linked SHG for cooked food	Linked PHC
Fatorda	-	-	As per weather forecast	1. Pandit Jawarhalal Nehru Stadium, Fatorda	1. Rajesh Naik, Stadium Manager, 9423058012	1. Shri Vakratund, Narmada Kundaikar 9096498909 2. Swatistik Self help group, Kavita Poojary 9960748231 3. Om Self help group Kunnaikar Self Help Group Asha Gaues 9423319103	
Chandor	-	-	As per weather forecast	1. Village Panchayat Community Hall of Chandor – Cavorim. 2. Multipurpose Hall of V.P Chandor-Cavorim	0832-2784250 0832-2784250		PHC, Chandor
Sao-Jose-De-Areal	-	-	As per weather forecast	1. Sao-Jose-De Areal Sports Club Hall 2. Multipurpose Community Centre	- -	-	PHC, Sao-Jose-De- Areal

VP vulnerable	Areas vulnerable	Households likely to be affected	Expected time of floods	Identified shelter	Shelter home incharge (preferably from local VP)	Linked SHG for cooked food	Linked PHC
				3. Govt. Primary -Middle -School	Alistan Fernandes 9049051733		
Guirdolim	-	-	As per weather forecast	1. Guirdolim Sports Club	Gidwan D 'costa 9822388765	1. St. Francis Xavier SHG, Guirdolim. Surekha Kamble 9850483702 2. Our Lady piety President FlaviaFijardo 9822580735 3. Niamar SHG Josephine D'Silva 7588424851 4. Maalaxmi SHG, VanitaKalekar 9423219868	PHC, Curtorim
Macasana	-	-	As per weather forecast	1. Village Panchayat Hall	1. Caitana 9637474355	Gloria Self Help Group 9850670548	PHC, Curtorim

VP vulnerable	Areas vulnerable	Househ olds likely to be affected	Expected time of floods	Identified shelter	Shelter home incharge (preferably from local VP)	Linked SHG for cooked food	Linked PHC
Colva	-	-	As per weather forecast	1. Our Lady of Merces Hall 2. Lions Club Colva Hall	1. Fr. Simplicio Fernandes 08322788512 2. Mahesh lotlikar 9823351123		
Majorda	-	-	As per weather forecast	1. Associacao Academica de Majorda-Utorda-Calata(Club Hall)	1. Sweety • 9049558427 • 2791073	1. Analee 7507801953 2. Auxilia 9890545354 3. Vanessa 7744835019	PHC Majorda
Betalbatim	-	-	As per weather forecast	1. Social Club Hall	1. Clriaco Cota 9881344342 2. Peter Pereira 9822387050	MeghanaKalekar 9422445132	Health Sub Centre Betalbatim PHC Cansaulim
MORMUGAO							
NIL	NIL	NIL	NIL	Cyclone shelters constructed by WRD in Dabolim, Cuelim and Zuarinagar			
PONDA							

VP vulnerable	Areas vulnerable	Households likely to be affected	Expected time of floods	Identified shelter	Shelter home incharge (preferably from local VP)	Linked SHG for cooked food	Linked PHC
Usgao-Ganjam	Sonarbag, Kantor, Godega Parsol, Tankwada, Mharvapaz, Tiral, Meditembi, Kerwada, Gonkarwada, Panchwda.	301	During High Tide	1]GPS Usgao, 2]GPS Ganjam	1] Smt. Shakuntala Kurtarkar, ADEI, Mob. No. 9067727481 2] Smt. Uma M. S. Cuncolienar, ADEI Mob. No. 9527548878	1] Avita Dias, Sona SHG Sonarbag, Usgao Mob. No. 8552870480 2] Pragati P Naik, Shree Bhumi Adinath SHG Tiral Usgao Mob. No. 8698073482 3] Parvati M Phadte, Shantadurga SHG Gajem Ward No.1, Mob. No. 7588497724	Dr. Sandesh Madkaikar, PHC Pillium-Dharbandora Mob. No. 9011025048
Betora-NirankalConxem-Codar	Saterimol, Zamblimol, Kumbharwada, Codar	57	During High Tide	1] Govt. High School, Betora, 2] GPS Kumbharwada, Nirankal, 3] GPS Conxem, 4] GPS Codar.	do	Vikrant Shetkar & Sharmila Gaonkar, Shivsai SHG Betora Mob. No. 7507080578	Dr. Rita, PHC Shiroda Mob. No.

VP vulnerable	Areas vulnerable	Households likely to be affected	Expected time of floods	Identified shelter	Shelter home incharge (preferably from local VP)	Linked SHG for cooked food	Linked PHC
Betqui-Candola	Bagwada, Wadiwada, Gaonkarwada, Jalmiwada, Kurduwada, Jaidwada	50	During High Tide	1]GPS Betqui, 2]GPS Candola	do	1] Suvarna A. Naik, Sai Vishnu SHG BetquiCandola Mob. No.7888287844 2] Manashree Gaude, ShriLaxmi Narayan SHG BetquiCandola Mob. No. 9881285653	Dr. J. Branda , PHC Betqui Mob. 9011025026
Savoi-Verem-Vaghurme	Madakwada, Kawangal, Vaghurme, Kanakwada, Bandwada,	86	During High Tide	GPS Savoi-Verm	do	AashaPednekar, MauliSHGVeremVaghurme Mob. No. 9158967613	Dr. J. Branda , PHC Betqui Mob. No. 9011025026
Volvoi	Sateribhat, Inambhat, Kamatwada, Deulwada, Fondchebhat, Metwada, Haliwada	55	During High Tide	GPS Volvoi	do	PriyankaNaik&SharadNaik, Ganaraya SHG Volvoi, Mob. No. 8275085580	Dr. J. Branda , PHC Betqui Mob. No. 9011025026
Curti-Khandepar	Kadsal, Murdi, GauthanNalla	62	During High Tide	1]Sports Complex Building, Curti,	1] NilamMayekar,APE O Mob. No.	VasantiShenvi, Curti-Khandepar, SHG, Mob. No.	Dr.SmitaParsekar, PHC

VP vulnerable	Areas vulnerable	Households likely to be affected	Expected time of floods	Identified shelter	Shelter home incharge (preferably from local VP)	Linked SHG for cooked food	Linked PHC
	kond			2]Opa Water Works PWD Building, Opa, Khandepar	8275619030 2] ShriYeshwantMapari, A.E. Mob. No. 7972418766/ 9370694549	9822796918	Ponda Mob. No. 9011025059
Borim	Near Sakav at Paniwada	-	-	GPS Borim	1] Smt. ShakuntalaKurtarkar, ADEI Mob. No. 9067727481 2] Smt. Uma M. S. Cuncolicar, ADEI Mob. No. 9527548878	Neelima Chari, Deeplaxmi SHG Borim, Mob. No. 9699336910 2] ManishaNaik, Kulpurush SHG Borim Mob. No. 820840572	Dr.Rita, PHC Shiroda Mob. No.
				Community Hall Hoddar, Assolna G.P.S. Hodar Sateri Temple	Sushant Naik 9823603764 Chaya Naik Uttam Raut Dessai 9890754181		
				Panchayat Hall, Molcornem	Sarpanch 9423140140		
				Govt. high school, Bomdamol	Satish Shirodkar 9689475350		
				Shantadurga Cuncolicarin, Fatorpa	Devasthan Committee		
				Khanderai Sabhagruh, Fatorpa	-do-		

VP vulnerable	Areas vulnerable	Households likely to be affected	Expected time of floods	Identified shelter	Shelter home incharge (preferably from local VP)	Linked SHG for cooked food	Linked PHC
				Siddapurush Hall, Fatorpa	-do-		
				Satpurush Hall Fatorpa	-do-		
				Shri Bhumipurush Faterpekarin	-do-		
				Church/ Gatto	-do-		
				Panchayat Office Ambaulim	Sarpanch		
				Community Hall, Balli	V.P. Ballil		
				Ballikarin Saunsthan, Balli	Mohandas FalDessai		
				Govt. high school Xeldem	Headmaster		
				V.P. Xeldem	V.P. Secretary 2662230		
SANGUEM							
Sanguem Municipality	Dando	1	In case of continuous rain for 2 to 3 days	GPS Dando	ADEI & Headmaster of GPS Dando		PHC Sanguem
CANACONA							

VP vulnerable	Areas vulnerable	House olds likely to be affected	Expected time of floods	Identified shelter	Shelter home incharge (preferably from local VP)	Linked SHG for cooked food	Linked PHC
Srishtal	Bhatpal&Ord hofond	App. 10 nos	July, August, September, October	Chapoli	SrishtalPanchayat clerk	Self Help Groups of Srishtal	CHC
Poinguinim	Colsor, Talpana, Galgibag, Sadolxem, Muthal	App. 30 Nos	July, August, September, October	Mahalwada	Shri SadanandVidhyalay aPoinguinim Clerk	Shri Prakash Bhat	Dr.kalilda sAyya (R.H.C.)
Lolien	Maik, Iddar, Mashem	10 Nos	July, August, September, October	Mahalwada	S.S. Angle H.S. Clerk	Shri Prakash Bhat	R.H.L. Dr.Vikasp awaskar
Nag-Pal	Kindlem, Mangan, Panyefond	15 nos	July, August, September, October	Nagarcem (CMC)	Shri Mallikarjun High school Canacona	Shri Ramesh Caterers	Govt. High school Shelter
				Cyclone Shelters created by WRD in Mahalwada (V.P. Poinguinim), Chapoli (V. P. Srishtal) and Nagarcem (M.C. Canacona)			
DHARBANDORA							

VP vulnerable	Areas vulnerable	Househ olds likely to be affected	Expected time of floods	Identified shelter	Shelter home incharge (preferably from local VP)	Linked SHG for cooked food	Linked PHC
V.P. Dharbandora	Daukond	App. 25	July/ August	Immaculate Conception High School Kalsai	V.P. Kirlapal Dabal	Dhareshwari Self Help Group Dharbandora	PHC Pilliem
V.P. Sacordem	Aglote	App. 25	July/ August	Hirabai Talaulikar High School, Sacorda	V.P. Sacorda	Vandevati Self Help Group	PHC Pilliem

LANDSLIDES IN MONSOON

HISTORICAL ANALYSIS.

Sl. No	Year	Taluka	Village/ location	Date of occurrence	Household affected	Lives lost	Any curative measures proposed
SALCETE							
1	2017	Salcete	Behind House of Mrs. Fransquina Mascarenhas, H.No.1306/A, Damon(E) Raia	During Monsoon	One	Nil	Retaining wall to be constructed
2	2018	Salcete	-do-	-do-	-do-	-do-	---
3	2019	Salcete	-do-	-do-	-do-	-do-	---
4	2020	Salcete	Behind House of Mrs. Fransquina Mascarenhas, H.No.1306/A, Damon(E) Raia	During Monsoon	One	Nil	Retaining wall to be constructed
		Salcete	Baradi, Zoriwado Velim	17/7/2020	-	-	Retaining wall to be constructed
5	2021	Salcete	Behind House of Mrs. Fransquina Mascarenhas, H.No.1306/A,	During Monsoon	One	Nil	Retaining wall to be constructed

Sl. No	Year	Taluka	Village/ location	Date of occurrence	Household affected	Lives lost	Any curative measures proposed
			Damon(E) Raia				
	2021	Salcete	1. Rangallim Velim	August 2021			Retaining wall to be constructed
			2.Behind the house of Caitano Pinto (Zoriwado)	2021	-	-	Retaining wall constructed
			3.Behind the house Santan Pinto (Zoriwado)	2021	-	-	Retaining wall constructed
6	2022	Salcete	Behind House of Mrs. FransquinaMascar enhas, H.No.1306/A, Damon(E) Raia	During Monsoon	One	Nil	Retaining wall to be constructed
MORMUGAO							
1	2017	Mormugao	NIL	NIL	NIL	NIL	NIL
2	2018		NIL	NIL	NIL	NIL	NIL
3	2019		NIL	NIL	NIL	NIL	NIL
4	2020		Mormugao Municipal Council Opp. Goa Shipyard Ltd.	21/09/2021	15	01	Retaining wall to be constructed or slope to be reduced. NOC needed from land owners. 15 households are likely to be affected
5	2021		Mormugao Municipal Council	18/07/2021	NIL	NIL	Retaining wall to be constructed water

Sl. No	Year	Taluka	Village/ location	Date of occurrence	Household affected	Lives lost	Any curative measures proposed
			Chowgule Office Building Harbour				channel to be created and eviction process of those staying on the encroached land.
PONDA							
1	2017	NIL	NIL	NIL	NIL	NIL	NIL
2	2018	Ponda	Property in Sy. No. 94/1 & 94/2 of Village Curti Khandepar	25/06/2018	NIL	NIL	As per direction of Disaster Management the Ex. Eng. WD-XV (NH), PWD, cleared the NH 4A, (748)
3	2019	Ponda	NIL	NIL	NIL	NIL	NIL
4	2020	Ponda	NIL	NIL	NIL	NIL	NIL
5	2021	Ponda	NIL	NIL	NIL	NIL	NIL
QUEPEM							
1	2017	Quepem	NIL	NIL	NIL	NIL	NIL
2	2018		NIL	NIL	NIL	NIL	NIL
3	2019	Quepem	Naqueri-Betul	15/08/2019	BaburaoWadekar, TukaramZuvatkar and Savitri Kochrekar	NIL	Landslide boulder and uprooted tree to be removed from top of the hill.
4			Barcem	11/09/2019	DattaVelip and SoiruVelip	NIL	Retaining wall to be constructed
5			Curchorem	21/08/2019	SushantShambuN aik	NIL	Retaining wall to be repaired
6	2020		Xeldem	21/09/2020	Mrs. Sebastiana Gonsalves	NIL	Referred to the Asst. Engineer SD II, WD XXV (Roads) to take preventive measures immediately.
7	2021	NIL	NIL	NIL	NIL	NIL	

Sl. No	Year	Taluka	Village/ location	Date of occurrence	Household affected	Lives lost	Any curative measures proposed
SANGUEM							
1	2017	Sanguem	NIL	NIL	NIL	NIL	NIL
2	2018		NIL	NIL	NIL	NIL	NIL
3	2019		NIL	NIL	NIL	NIL	NIL
4	2020		NIL	NIL	NIL	NIL	NIL
5	2021		NIL	NIL	NIL	NIL	NIL
CANACONA							
1	2017	NIL	NIL	NIL	NIL	NIL	NIL
2	2018	NIL	NIL	NIL	NIL	NIL	NIL
3	2019	Cola	Cuddi	Rainy Season	NIL	NIL	Compound Wall Constructed.
4	2020	Loliem	Karai Near house of fuguro	September	NIL	NIL	Removed and already informed to Highway department.Till Date Retaining wall not provided.
		Poinguinim	Double “B” bar near at Batem bar	September	NIL	NIL	Already informed to Roads Department.
		Poinguinim	Near Jana Bhandari House	September	NIL	NIL	Returning wall not provided cutting of mud with steps executed.
	2021	NIL	NIL	NIL	NIL	NIL	NIL
	2022	Loliem	Near Shri Krishna Temple Khandlem	September	NIL	NIL	Half portion of returning wall not extended till date.
DHARBANDORA							
1	2017	Dharbandora	NIL	NIL	NIL	NIL	NIL
2	2018		NIL	NIL	NIL	NIL	NIL

Sl. No	Year	Taluka	Village/ location	Date of occurrence	Household affected	Lives lost	Any curative measures proposed
3	2019		NIL	NIL	NIL	NIL	NIL
4	2020		NIL	NIL	NIL	NIL	NIL
5	2021		NIL	NIL	NIL	NIL	NIL

7. VULNERABILITY MAPPING OF LANDSLIDES PRONE AREAS (HISTORICAL DATA + WRD DEPT+ PWD).

Taluka	VP vulnerable	Areas vulnerable	Households likely to be affected	Expected time	Intervention needed
SALCETE					
Salcete	Raia	House of Mrs. Fransquina Mascarenhas, H.No.1306/A, Damon(E) Raia	one	June to August	Retaining wall to be constructed
	Velim	1. Rangallim Velim 2. Behind the house of Caitano Pinto (Zoriwado) 3. Behind the house Santan Pinto (Zoriwado)	NIL	NIL	Retaining wall constructed
MORMUGAO					
Mormugao	Municipality Vasco	1) Opp Goa Shipyard Vaddem	Opp Goa Shipyard Vaddem Approx 11	June to August	Retaining wall to be constructed
	Municipality Vasco	2) Behind Shalom Abode Vollant Vasco	01 house & residency building	June to August	Retaining wall to be constructed
	Municipality Vasco	3) Kamat Residency Near	Building and Road	June to August	Retaining wall to be