A c t i o n P l a n for F l o o d s in A n d h r a P r a d e s h

3.1 Introduction

Flood is a temporary inundation of large regions as the result of an increase in reservoir, or of rivers flooding their banks because of heavy rains, high winds, cyclones, storm surge along coast, tsunami, melting snow or dam bursts. Floods are characterized as any high stream flow which overlap natural or artificial banks of a river or a stream and are markedly higher than the usual: a n d the inundation of low lands. Sometimes copious monsoon rains c o m o l n e d with massive oufflows from the rivers cause devastating floods. Flooding is caused by the inadequate capacity within the banks of the rivers to contain the high flows brought down from the upper catchment due to heavy rainfall. Areas having poor drainage characteristics get flooded by accumulation of water from heavy rainfall. Flooding is accentuated by erosion and silting of the river beds resulting in reduction of carrying capacity of river channel, earthquakes and landslides leading to changes in river courses, obstructions to flow, synchronization of floods in the main and tributary rivers and retardation due to tidal effects.

I n order to circumvent flood havoc, including flash flooding, preparation of an

emergency action is the need of the hour, comprising the activities as listed below

3.1.1 The Action Plan consists of the following activities:

1 . Identifying the main elements at risk;

2 D e c l a r a t i o n o f F l o o d disaster;

3. Flood Forecasting and Warning:

4. Trigger mechanism; and

5. Response mechanism of the concerned line departments alongside the tasks responsibilities of the official machinery.

3.1.2 Elements at Risk

Anything in the flood plains wil get inundated. Buildings built of earth, weak foundatlons and water soluble materlals will collapse endangering human beings and their property. Utilities like sewerage, water supply, communication lines, and power are put at risk. Food stock i n the godowns (storage houses), agricultural fields, salt pans, livestock, vehicles, machinery a n d e q u i p m e n t ' s mounted on the ground, fishing boats are also put at risk.

3.1.3 H a z a r d Z o n e s

According to Andhra Pradesh State Development Planning Society, the flood hazard zones for river Godavari are East and West Godavari; for Krishna river, it is Guntur and Krishna; for Pennar river the district affected is Nellore; and rivers Vamsadhara a n d Nagavalli affect Srikakulam district. The problem is intensified by factors like silting of riverbeds, reduction of carrying capacity of river channels, beds and banks leading to changes in river courses, obstructions to flow due to landslides, synchronization of floods in the main and tributary rivers and retardation

is estimated that 44% of AP's total territory is vulnerable to tropical storms and

related hazards, while its coastal belt is the most vulnerable, especially the area covering more or less the entire coastal region. Along the coastline, the secilon between Nizampatnam and Machilipatnam is most prone to storm surges. The fertile Delta areas of the Godavari and Krishna rivers, which contribute substantially to the State's agricultural economy, experience recurrent flood and drainage problems.

Besides natural surges a n d outflow of waters from streams a n d rivers, floods are c a u s e d by p e a k discharges. As part of AP Hazard Mitigation a n d Emergency Cyclone Recovery Project (CERP), the Andhra Pradesh State Remote Sensing Application Center (APSRSAC), the Department of Statistics and Planning, GoAP, had prepared several 100-year return perlod maps for all major river systems by the Revenue (Disaster Management Il) Department of GoAP in 2010. With a coastline of 974 kilometers, AP had experienced over 103 cyclones and resulting floods in the last century.

Devastating Tungabhadra Floods (2009)

The October-November 2009 floods in AP, occurred in Kurnool District which lles on the southern banks of Tungabhadra as well as Handri rivers. Normally, the river course receives small discharge up to 50,000 cusecs. However, by October 02, 2009 the river had received 2, 00,000 cusecs resulting in flood water entering the flanks of the river and Inundating 80% of Kurnool town and surrounding areas. Similarly, the capacity of Tungabhadra river course was 4,00,000 cusees. Mantralayam in Kurnool District along with other towns were severely affected due to the floods, a combined total of 87 Mandals: 525 villages were affected. which includes Kurnool, Mahbubnagar (now in Telangana State) and other An estimated 20.72 lakh people were affected due to the floods. Incessant rains and inevitable discharges from upstream reservoirs of Narayanpur and Tungabhadra dams were one of the primary reasons of unprecedented Inundation in Kurnool and Mahbubnagar districts between 30th September and 3rd October 2009.

3.2 Declaration of Flood Disaster

The Andhra Pradesh Disaster Management Rules(2007) provide for the State Government to declare any area, where floods have occurred or likely to occur as a disaster affected area on the recommendations of the Commissioner, Disaster Management (Revenue) Department (CDM) or the concerned District Collector (s). The purpose of the declaration is to organize effective response in mitigating the flood effects. Such a declaration provides for wide powers a n d responsibilitles to the CDM and the District Collectors in order to handle the incident effectively.

3.3 Flood Forecasting and Warnings

Flood forecasting is a process whereby the authorities are alerted to impending conditions where floods are likely occur. Flood forecasting requires understanding of meteorological and hydrological conditions and is therefore the responsibility of the appropriate government agencles such as IMD and Central Water Commission, they provide early warning in co-ordination with State Government Agencies such as Irrigation Department,

3.4 Community Based Flood Forecasting & Warning Systems

It Is important that the p e o p l e in e a c h community receive Information as early as possible about the possibility of flooding in their area. In addition to the valuable information from the official flood warning system, communities should attempt to develop their own warning systems. At community level, it is important that warnings a r e r e c e l v e d b y all individuals. The w a y in which messages are disseminated in communities will depend on local conditions, but may include some or all of the following devices:

a. Media warnings (both print and electronic)

b. General warning indicators for e.g.. sirens, fire crackers, drum beating. etc., could be used

C. Warnings delivered to areas by community leaders or emergency s e r v i c e s

d. Dedicated automatic telephone warnings to at-risk properties

Information about flooding and flood conditions in communities upstream. One approach to disseminating messages is to pass warning messages from village to village as the flood moves downstream

Keep watch and b e regularly Informed about the river level and embankment conditions in the local area. The monitoring of the river a n d e m b a n k m e n t should b e i n c r e a s e d as t h e w a t e r level i n c r e a s e s a n d crosses the critical danger level

g. A community-based warning system to pass any information about an approaching flood to every family.

f. Communities to be involved in d a t a collection for flood forecasting, and the importance of their role is vital to reduce risk of flooding to communities. They could take c a r e of installations/equipment, r e a d rain a n d water level record, Radio operators to report real-time observations and provide info to the concerned aufhorities on time.

3.5 Procedure for Disseminating Warnings to Remote Areas

The communitles in remote areas may not be able to recelve the types of warnings described in the previous section. Responsibilities need to b e d e fi n e d clearly for lower tiers of administration a n d t h e e m e rg e n c y services to h a v e pre d e fi n e d links with communities in r e m o t e areas. This should include:

(a) Local Radio, which should b e supplied with clear and accurate i n f o r m a t i o n

(b) Use of appointed community wardens with direct two-way Radio or Mobile Telephone access to warning agencies and emergency a u t h o r i t i e s

(c) Local means of raising alarms, for example church/temple bells, PA System, sirens, loud hailers, loud speakers, etc. The latter could b e the responsibillty of selected Individuals or w a r d e n s , w h o n e e d t o b e provided with equipment a n d transport, for example motor cycles or bicycles;

(d) 'Sky Shout' from emergency service helicopters.
(e) Doordarshan & local cable channels (TV & Radio Channels including FM Radio)
(f) HAMRadios
(g) Press Bulletins
(h) Satellite b a s e d Disaster Warning Systems
Fax. Telephone and Mobile Communications, etc.

3.6 Trigger Mechanism: Plan Activation

The flood response system will b e a c t i v a t e d on the o c c u r r e n c e of a h e a v y rain. The Commissioner, Revenue (DM) wil a c t i v a t e all the Departments for e m e r g e n c y response including the State EOC. The department will Issue instructions to include the following details:
(a) Specify exact resources required
(b) The type of assistance to be provided
(c) The time limit within which assistance is needed
(d) The State, District or Other contact persons/agencies for providing a s s i s t a n c e
(e) Other Task Forces with which coordination should take place

The State EOC a n d other control rooms at the state level as well as district control rooms should be activated with full strength. The GoAP may publish a notification in the Official Gazette declaring such locations to be disaster-affected areas under APSDM Rules (2007). O n c e the situation is totally controlled a n d normalcy is restored, the Revenue, (DM) declares "End of Emergency Response" and issues instructions to withdraw the staff deployed on emergency duties.

3.8 Role & Responsibilities of Departments at the District

3.8.1 Revenue Department

The Revenue Department at all levels in the State will b e responsible for response and relief operations. It should prepare a vulnerability analysis for all villages. The district gulde lists out all the villages located on river banks and were subjected to floods in the past with other defalls.

The d a t a should b e u p d a t e d o n c e in six months. It should earmark teams for rescue and evacuation, opening of shelters or relief camps, arranging transport for teams, warning public and disseminating information to al the concerned about relief operations / plans including non-governmental organizatlons taking part in the operations or likely to take part on arrival from outside the district.

Reception and briefing arrangements for the Army deployed for rellef work should b e arranged besides providing them with maps and/or guides. Organize relief camps, e m e rg e n c y feeding, clothing a n d household supplies a n d provision of temporary shelter assistance wherever necessary. They should also arrange for air dropping of food packets and water sachets in marooned and isolated villages.

3.8.2 Irrigation Department

The moment a heavy rain and flood warning is given by the IMD or the CWC, the Irrigation Department should arrange for patrolling of flood banks. It should keep

sand bags in sufficient numbers wherever needed to plug breaches. If should lower the water level in reservoirs on time according to the impending rainfall.

3.8.3 Roads & Buildings Department

As m a n y national highways pass through cities a n d villages, the Roads a n d Bulldings Depariment should keep a list of road points which are prone to Inundation and culverts which are weak and likely to overflow. Immediately after floods, i f should estimate damages and carry ouf repairs. Ifs immediate fask is to ensure that traffic is not interrupted a n d no relief activity is affected. Besides this, the department should also estimate damage to buildings, if any, and submit it to the authorities concerned. It should also keep helipads ready for flood relief operations.

3.8.4 Police Department

The Police Department Is responsible for law and order, protection of property, helping in evacuation, assisting in search and rescue operations, providing required number of radio sets with operators and positioning mobile VHF sets as per district plans. It should ensure speedy delivery of messages received and help in disposal of the dead, if any. During floods and heavy rains, the Police should also ensure that no trucks and buses cross causeways and bridges especially when the streams and rivulets a r e in spate, especially when they are under water. Quite often, vehicles are washed away when they ply on causeways and bridges under w a t e r.

3.8.5 Information Department

The District Public Relations Officer should e d u c a t e public o n flood hazards a n d the steps they should take. It can do this through local newspapers, posters and handbills. It can exhibit posters at prominent public places such as bus terminals, railway stations, post offices and cinema halls. People should b e advised to listen to All-india Radio bulletins made avallable by the Information & Public Relations Department. Slides on important aspects of "Dos" and "Don'ts" should be shown in cinema halls. Community radlo sets should be checked by Sarpanch/ execuilve officer / village secretary / headmaster of elementary school. The PRO should also carry out media liaison release approved information for publication / telecast.

3.8.6 Medical & Health Depariment

The District Medical and Health Officer is responsible for providing emergency medical treatment to flood victims, maintenance of public health, checking the quality of drinking water and maintaining sanitary conditions. It should train selected volunteers in villages in first aid, coordinate utilization of medical teams, medical supplies and a m b u l a n c e s a n d issuance death certificates, etc.

3.8.7 Education Department

Flood rellef should be included in school curriculum. School and college buildings should b e m a d e avallable for relief camps. The c a m p s should h a v e an a d e q u a t e number of toilets and water. Schools and colleges could also b e used for organizing a w a r e n e s s c a m p s .

3.8.8 Electricity

As Disaster Preparedness Measures suggest, power lines a n d installations a r e to b e kept free from obstructions. They should maintain power supply at the best possible

level during floods, particularly at relief camps and hospitals/treatment centers, adopt public safety measures for installations d a m a g e d and provide generators.

3.8.9 Forest Depariment

The Forest Department should b e ready to procure and supply material such as b a m b o o s a n d p a l m leaves for temporary shelters especially in slum areas.

3.8.10 Transport Department

The Reglonal Transport Officer or the Deputy Commissioner (Transport) should provide the required number of vehicles as per allocations m a d e by the Municipal Commissioner. Data of available transport in the district should be maintained.

3.8.11 Posts & Telecommunications Depariment

It should provide additional telephones for rellef operations as requested by the Municipal Commissioner a n d ensure rapid repair of d a m a g e d t e l e c o m m u n i c a t i o n s .

3.8.12 Training of Government Officials

Al officers likely to be drafted for flood duty should be trained. At the moment, organizations. like Administrafive Training Institutes (Alls) are organizing regular courses on disaster m a n a g e m e n t .

3.9 Relief Measures

3.9. 1 Short Term Relief Measures

a) Food & Nutrition

In an extreme flood situation, people lose standing crops and stored food grains. In such cases, free distribution of foods shall be m a d e to avoid hunger a n d malnutrition. Wherever is possible, dry rations should be distributed for home cooking.

b) Water

Water supply is Invariably affected in natural disasters. Availability of safe drinking water is very challenging particularly during floods. It must be ensured that affected p e o p l e have a d e q u a t e facilities a n d supplies to collect, store and use clear a n d safe water for drinking, cooking and personal hygiene.

c) Health

During post-disaster phase, many factors increase the risk of diseases and epidemics because of overcrowding, Inadequate quantity and quality of water, poor environmental and sanitary conditions, decaying biological matter, water stagnation a n d i n a d e q u a t e shelter& food supplies. There should b e a d e q u a t e supply of medicines, disinfectants, fumigants, etc., to check outbreak of epidemics. It should be ensured that the medicines have not reached expiry date.

d) Clothing & Utensils

The people affected by the disaster shall be provided with sufficient clothing, blankets, etc. to ensure their safety and well-being. Each disaster affected household shall be provided with cooking and eating utensils.

e) Shelter

In case of flood, a large number of people are rendered homeless. In such situations shelter becomes a critical factor for survival and safety of the affected population. In vlew of this, flood affected people, who have lost their houses shall be provided

sufficient c o v e r e d s p a c e for shelter. Disaster a ff e c t e d households shall b e provided
with necessary tools, equipment a n d materials for repair, reconstruction and maintenance for safe use of their shelter.

f) Relief camp

Relief camps also provide good temporary arrangements for people affected by flood. Adequate number of bulldings or open space should be identified where relief camps c a n b e set u p during emergency. The requirements for operation of relief camps should be worked out in detail in advance. The temporary relief camps should have adequate provision of drinking water and bathing, sanitation and essential health-care facilities.

g) Sanitation and Hygiene

Sanitation services a r e crucialto prevent a n outbreak of epidemics In the post-disaster phase. Therefore a constant monitoring of any such possibilities needs to be c a r r i e d o u t . It s h o u l d b e e n s u r e d t h a t d i s a s t e r a f f e c t e d h o u s e h o l d s h a v e a c c e s s f o
sufficient hygiene measures.

3.9.2. Interim Relief Measures

a) Arrangements to be made for quick identification and maintenance of the records of disposal of dead bodies in the affected areas (Home Dept., Revenue Dept., Health Dept. and Local Authorities).

b) Arrangements to be made to record the complaints of all persons reported missing. Follow u p action in terms of verification of the report also needs to b e made (Home Department)

c) District Magistrates and Sub-Divisional Magistrates to be empowered to the requirement of identification and post-mortem in case of
mass casualties. Revenue Dept may depute additional Sub-Divisional Magistrates to expedite disposal of the dead bodies (Revenue & Home Departments)

d) Unclaimed/ unidentified dead bodies to be disposed of with help of pre-identified voluntary agencies at the earlest after keeping their records. (Home, Revenue, Health Departments & Local Bodies)

e) Additional manpower to be deployed in the affected areas for supplementing the efforts of the local administration (General Administration Department (GAD)).

Separate Cell to be established at State/District/Mandal levels to coordinate with the NGOs and donor/ aid agencies. (Revenue Department)

g) Regular Meetings of the different stakeholders/departments should be organized at state level for sharing information, developing strategies for relief operations. (Commissioner, Disaster m a n a g e m e n t & Collectors at the District Level)

h) Information & Public Relations Dept to coordinate with the media to play a positive role In disseminating appropriate information to public and the government in order to facilitate the speedy recovery (1&B Department).

3.9.3 Assessment of Damage/ Loss and Relief Needs
The Commissioner, Revenue (DM) to issue instructions to the District Collectors to provide the "Need Assessment Report". The Revenue (DM) should consolidate the same and to prepare the State's "Need Assessment Report".
b) The Commissioner, Revenue (DM) to issue Instructions to the District Collectors to provide the "Damage and Loss Assessment Report". The Commissioner, DM to consolidate the same and to prepare the State's "Damage and Loss Assessment Report" which wil be useful in planning and implementing the relief operations for disaster victims.
Revenue Department)
d) the Relief Need Assessment Report should be provided by the Collectors to GoAP (Commissioner. DM. fornecessary action)
e) Identification and demolition of dangerous structures in the affected areas to minimize further loss of life a n d injuries. (R & B, Revenue Departments a n d Local Bodies)
f) Arrangements for distribution of gratuitous rellef a n d c a s h doles. (Revenue Dept., Panchayati Raj &Rural Housing, Urban Development Departments and the Collectors)
g) Arrangements to be made for survey of human loss and distribution of ex-gratia relief to the families of deceased persons. (Revenue Department)
h Te a m s t o b e f o r m e d and dispatched to the a f f e c t e d a r e a s for d e t a i l e d assessment of houses a n d property d a m a g e assessment (Revenue Depariment and Local Bodies)
1) Satellite based Disaster Waning Systems.
D Telephone/Fax
The S E O C a n d o t h e r c o n t r o l r o o m s a t t h e s t a t e l e v e l a s w e l l as district c o n t r o l r o o m s
should be activated with full strength. The State Government may publish a notification in the official gazette, declaring such area to be disaster-affected area under APSDMA Rules of 2007. Once the situation is totally controlled and normalcy is restored, the Commissioner Revenue (DM) declares End of Emergency Response and issues instructions to withdraw the staff deployed in emergency duties.
3.10 Other Important Concerns at the District and below Levels
3.10.1 People's Participation
As we involve people in development projects right from the planning stage through participatory methods, w e could d o t h e s a m e in the c a s e of Disaster Management. Officials could discuss flood disaster in wards also. They could also discuss the subject in SHG groups. Women, being the managers of houses, could play a key role during disasters.
3.10.2 Awareness Campaigns
A campaign should be launched to promote awareness of disasters and people's participation in meeting them. It should cover people, elected representatives of local bodies, institutions, students, w o m e n groups, NGOs a n d local political leaders. The Information & Public Relations Department, with the help of media, Is most

suited for this purpose. This awareness campaign should be taken up in all vulnerable villages. Once the public, the concerned officials and volunteer groups are fully aware of the repercussions of floods, they would be prepared to face them. Disaster Management (DM) Teams can be formed from among the category of persons identified above. One amongst them could b e selected as a t e a m l e a d e r .

3.10.3 N e e d s A s s e s s m e n t

The DM Teams should be able to Identify the resources available at ward level and Immediately after the floods. Such d a t a avallable for ward should b e included in ward / division resource record. The record will be useful in identifying resources that h a v e to be brought from outside the ward / mandal. Such assistance c a n b e quantifled a n d requisitioned.

3.10.4 Preparedness Plan

Having achieved this, the DM Team can translate Its awareness into preparedness by enlisting participation of all sections of society. It Is important that women members i n the team are consulfed as they give useful suggestions particularly affecting women and children. An action plan has to be drafted based on ideas g a t h e r e d over a series of mutual discussions: The plan should Ilst out the actions to be carried out by various persons at specified time periods and list the resources (both h u m a n a n d material) to be used.

3.10.5 Potential for Reducing Hazard

Embankments along the rivers, sea walls along the coasts may keep water away from the flood plains. Water flow can be regularized through construction of the reservolis, c h e c k dams, alfernate d r a n a g e channels/routes, and Increasing vegetation cover and by providing storm drains.

3.11 Main Mitigation Strategies

3.11.1 Mapping of the Flood-prone areas

This is a primary step involved in reducing the risk of the region. Historical records give the indication of the flood inundation a r e a s a n d the period of occurrence a n d the extent of the coverage. The basic m a p is c o m b i n e d with other m a p s a n d d a t a to form a complete image of the flood plain. Warning can be issued looking into the earlier marked heights of the water levels in case of potential threat. In the coastal areas the tide levels and the land characteristics will determine the submergence areas. Flood hazard mapping will give the proper indication of water flow during floods.

3.11.2 Land use control

This wil reduce danger of life a n d property w h e n waters inundate the floodplains and the coastal areas. The number of casualties is related to the population in the area at risk. It's better to reduce the densitles in areas where neighborhoods are to b e developed. In a r e a s where p e o p l e already h a v e built their sefflements, measures should b e taken to relocate to better sites so as to r e d u c e vulnerability. No major development should be permitted in the areas which are subjected to high flooding, Important facilities should be bullt in safe areas. In urban areas, water holding areas can b e created in ponds, lakes or low-lying areas.

3.11.3 Construction of engineered structures

Construction activity in the flood plains and strengthening of structures to withstand flood forces and seepage is the sine qua-non. The bulldings should be constructed on an elevated area: and, If necessary bulld on stilts or platform,

3.11.4 F l o o d C o n t r o l

I t aims at reducing flood damage. This c a n b e done by Flood Reduction by decreasing the a m o u n t of runoff by treatment like reforestation (to increase absorption could be a mitigation strategy in certain areas, protection of vegetation, clearing of debris from streams and other water holding areas, conservation of ponds and lakes etc. Flood Diversion includes levees, embankments, d a m s and channel improvement. Dams can store water and can release water at a manageable rate. Flood Proofing reduces the risk of damage. Measures include use of sand bags to keep flood water away, blocking or sealing of doors and windovs of houses etc. Houses may be elevated by building on raised land. Buildings should be constructed away from water bodies.

3.11.5 Flood Management

Flood management comprises both structural a n d non-structural measures. Structural measures include storage reservoirs, flood embankments, d r a i n a g e channels, anti-erosion works, channel improvement works, detention basins etc. Non-structural measures include flood forecasting, flood plain zoning. flood proofing, disaster preparedness etc. The flood m a n a g e m e n t measures undertaken so far have provided reasonable degree of protection to an area of 15.81 million hectares throughout the country.

3.11.6 Community Based Flood Disaster Mitigation

Apart from the sustained efforts by the government and experts to bring about s p e e d y recovery soon after the flooding, It Is the responsibility of the local community that plays a vital role in mitigating the sufferings at the grassroots through its active involvement in several different ways. Sedimentation clearance, reforestation program, dike and flood wall construction can be taken as part of the community based mitigation program. The community could be capable of participating in flood fighting by organizing work partles to repair embankments, p l e sandbags a n d stockpile needed materials. Farming practices h a v e to b e flood compatible. Special varleties of seeds are available which c a n b e harvested during the flood season. Houses constructed need to be flood resistant and multi-purpose shelters should b e constructed by the community. Banks of the earth can be raised and it can give shelter to the community as well as the livestock during the time of floods.