



ENRICH YOUR LIFE SKILLS & CAREER

by- Dr. Jitendra Nagpal
Page 45



INSPIRE CREATIVITY AND INSTILL PASSION & OPTIMISM

Success Stories-11

Page 46



DISASTER MANAGEMENT IN INDIA

by- Shikha Singh

Page 47



NEWS DIGEST

Page 48

FLOOD MANAGEMENT: EMERGING CHALLENGES

Anil Anand

Traditionally speaking heavy rainfall is held solely responsible for floods, particularly in the Indian context where Monsoon is vital to sustain the agriculture sector. It is a universal truth that floods occur due to heavy rainfall when the natural water routes exceed their capacity to hold the entire mass.

But there is another fact that floods are not always caused by heavy rainfall. This phenomenon has of late, been acquiring a new but serious dimension of human contribution that results into man-made catastrophe. There are, therefore, two facets to flooding; natural and manmade. The man-made component is dangerously mixing up with the natural factors to give flooding propelled by natural factor a more lethal dimension.

The unnatural factors contributing to flooding are on account of global warming, environmental degradation, poor town and farm planning, growing greed to encroach upon every



inch of available land more so in the areas which provide outlets to water during rainy season. The other unnatural contributory factors, causing floods particularly in coastal areas where surging storms can cause huge water logging, inundation can be, a storm or a tropical cyclone, a tsunami or a high tide coinciding with higher than normal river lev-

els. The earthquakes causing damage to Dams could also result in flooding of the downstream area, even in dry weather conditions. But this is not a regular feature and is a once-in-a-while occurrence.

There is certainly a change in pattern of flooding which is directly related to changing pattern of rainfall. This change is

hugely discernible in what the Monsoon model used to be decades back. Due to technological up gradation the meteorology experts or what we popularly call as weathermen have of late been predicting monsoon and other weather conditions with near perfection. It definitely provides enough time-frame for the governments both at the Centre and the states to plan disaster management drills well in advance both in the event of flooding caused by abnormally heavy rains or droughts due to deficient rainfall. But it is beyond any scientific means to either design or keep the rain patterns under control. Therefore a multi-pronged strategy is needed in consonance with the changing rain patterns to manage floods.

Out of various disasters that occur in India floods are most common and frequently occurring source of disaster. This factor has been further compounded with the weathermen noticing an irregular pattern of monsoon. The fact that this rainy season is

heavily concentrated in a short span of three to four months of the season, it results in heavy discharge from rivers resulting in devastating floods at times. Another new dimension posing a challenge, which is being witnessed during the past few years, is related to either the unseasonal rains or even shift in the traditional periodicity of Monsoon.

The major flood areas in India are in the Ganges-Brahmaputra-Meghna basin which accounts for nearly 60 percent of the total river flow of the country. The data compiled by the National Flood Commission shows that about 40 million hectares of land area is prone to flood in the country. On an average, the area affected by floods annually is about 8 million hectare, out of which the cropped area affected is about 3.7 million hectare.

According to an estimate, over 60 percent of the flood damage in the country results from river floods. Another 40 percent is the

Continued on page 45

FLOOD MANAGEMENT...

Continued from page 1

result of heavy rainfall and cyclones. Himalayan Rivers account for 60 percent of the total damage in the country. In the peninsular river basins, most of the damage is due to cyclones and in the Himalayan Rivers about 66 percent is due to floods and 34 percent by heavy rains. State wise study shows that about 27 percent of the flood damage in the country is in Bihar, 33 percent by Uttar Pradesh and Uttarakhand and 15 percent by Punjab and Haryana.

In India floods are mostly caused by heavy precipitation and at time cloud bursts in the hills or upstream. The rivers start spilling over if rainfall of about 15 centimeter or more occurs in a single day. This phenomenon affects areas in west coast of Western Ghats, Assam and sub-Himalayan West Bengal and Indo-Gangetic plains.

The other factors causing floods are due to rise in river bed that is accumulation of silt and sand with no clearing operations taking place for years on. The Himalayan Rivers having huge ingredients bring in large amount of silt and sand that ultimately get accumulated in the catchment areas downstream. As a result the water carrying capacity of the rivers is drastically reduced that ultimately results in flooding of areas. Obstruction of free flow of

water in the rivers caused by construction of embankments, canals and railway related activities also results in floods. A glaring example to this effect was river Jhelum on the banks of which Srinagar and many other towns are situated. The river could not cope with sudden and huge flow of water due to long spell of rains as its capacity had been limited by silt and sand with no efforts over the past five decades to undertake dredging of this material. It was a sudden wake up call for the authorities but it was too late.

Deforestation has direct bearing on climate change that has resulted into global warming conditions. Deforestation of hill slopes from where the rivers flow down to plains, leads to lack of holding capacity resulting in water speedily hurtling down. This deforestation also leads to erosion as trees play a vital role to hold the surface on mountains and create natural barriers for rain water to come rushing down. As a result

and Kashmir, parts of Punjab, Haryana, Western Uttar Pradesh and Himachal Pradesh. The Jhelum, the Sutluj, the Beas the Ravi and the Chenab are the main rivers that cause floods in this region.

The Central and Peninsular river basins cover Madhya Pradesh, Odisha, Andhra Pradesh and Maharashtra where rivers such as the Narmada the Tapi, the Chambal and the Mahanadi cause flood. Heavy floods occur in the Godavari, the Krishna the Pennar and the Cauvery at long intervals and flood problem is generally serious.

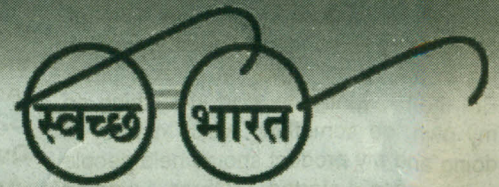
Despite the changing pattern of monsoon this flooding pattern which at times assumes serious proportions still could be considered as a traditional source of inundation which swarms through the vast expanse of rural India. In turn it has been over the years causing major devastation to the agriculture sector. The new addition to this is the phenomena of urban flooding as witnessed in the metropolitan cities of Mumbai, Chennai, Bengluru and others such as Srinagar.

The root cause of urban flooding is the mindless migration from rural areas to the cities that in turn has caused immense pressure on land for housing and commercial activities. The failure and in many cases complicity of the civic authorities and even governments in checking encroachment of land particularly in areas which were the traditional outlets for the overflowing rivers

and tributaries has led to unprecedented floods in the cities. Most of the major cities of the country are faced with danger of inundation thanks to misgovernance, poor planning, corruption related to encroachment of land and reckless unauthorised construction.

The recent disturbing examples of this kind of vandalism resulting into unprecedented floods are Chennai and Srinagar. Before that it was Mumbai. The unplanned commercialisation in the name of creating infrastructure for housing and economic reasons resulted in the cities being incapacitated to withstand natural shocks.

These disasters were avoidable had the authorities concerned strongly crushed the vested interests and remained in full preparedness in terms of preventive measures and meet any eventuality resulting due to flooding. These vested interests are a conglomerate of town planners, bureaucrats and even politicians.



एक कदम स्वच्छता की ओर

level set up has water resources departments, flood control board and state technical advisory committee. The Central mechanism has a network of organisations and expert committees constituted from time to time to study advice on flood management.

The Centre-states mechanism needs to be further strengthened with focus on greater coordination. This has to be a continuous and ongoing system rather than waking up at the time of the calamity only. The coordinated effort can help in planning various flood control measures in advance which include raising infrastructure the crisis management network backed by modern technology.

Given the new challenges on the environment front and issues of misgovernance it is difficult for the states to plan flood management on their own. The Centre and the states through a joint plan should undertake various measures to control floods. This includes construction of embankments, flood walls, ring bunds, flood control reservoirs to temporarily hold some quantity of flood water to control flow of water downstream within safe limits.

Improvement of river channels and surface drainage and most importantly checking erosion of land on river banks are others measures that could help checking the spread of flood water if not preventing these altogether.

Under the prevailing circumstances and new challenges it will be naive to look at flood management as an isolated subject. It is imperative that flood control and management system is strengthened. But it is equally important that this should be seen in the light of environmental degradation, global warming and poor governance at various levels.

Any approach aimed at flood management should include all these key factors. The management cannot be done in isolation with old-time irrigation and flood control departments. The technological advancements available to generate data with precision

ingredients bring in large amount of silt and sand that ultimately get accumulated in the catchment areas downstream. As a result the water carrying capacity of the rivers is drastically reduced that ultimately results in flooding of areas. Obstruction of free flow of water in the rivers caused by construction of embankments, canals and railway related activities also results in floods. A glaring example to this effect was river Jhelum on the banks of which Srinagar and many other towns are situated. The river could not cope with sudden and huge flow of water due to long spell of rains as its capacity had been limited by silt and sand with no efforts over the past five decades to undertake dredging of this material. It was a sudden wake up call for the authorities but it was too late.

Deforestation has direct bearing on climate change that has resulted into global warming conditions. Deforestation of hill slopes from where the rivers flow down to plains, leads to lack of holding capacity resulting in water speedily hurtling down. This deforestation also leads to erosion as trees play a vital role to hold the surface on mountains and create natural barriers for the rain waters to come gushing down. As a result the water level in rivers suddenly raises causing floods.

Serious efforts are being made by the Centre and the state governments to check deforestation. Forests have been nationalised during the last decades in many of the Himalayan states to prevent reckless felling of trees. This coupled with tree plantation drives at all levels are steps in the right direction. The much required dividends in terms of flood controlling floods would only be visible if these efforts are sustained on firm footing and long term planning basis but done on the basis of scientific studies.

The most flood prone regions of the country include the Basin of Himalayan Rivers spread over part of Punjab, Haryana, Himachal Pradesh, Delhi, Rajasthan, Uttar Pradesh, Bihar and West Bengal. Also the North-Western river basin covering Jammu



immense pressure on land for housing and commercial activities. The failure and in many cases complicity of the civic authorities and even governments in checking encroachment of land particularly in areas which were the traditional outlets for the overflowing rivers

and tributaries has led to unprecedented floods in the cities. Most of the major cities of the country are faced with danger of inundation thanks to misgovernance, poor planning, corruption related to encroachment of land and reckless unauthorised construction.

The recent disturbing examples of this kind of vandalism resulting into unprecedented floods are Chennai and Srinagar. Before that it was Mumbai. The unplanned commercialisation in the name of creating infrastructure for housing and economic reasons resulted in the cities being incapacitated to withstand natural shocks.

These disasters were avoidable had the authorities concerned strongly crushed the vested interests and remained in full preparedness in terms of preventive measures and meet any eventuality resulting due to flooding. These vested interests are a conglomerate of town planners, bureaucrats and even politicians. There is no denying the fact that public component is also there be it due to housing needs or otherwise.

Flood control as a subject has no clear cut legislative marking. As a subject it is not included in any of the legislative lists of the country that is the Union, the State or the Concurrent lists. This is a different matter that issues related to drainage and embankments find a mention in Entry 17 of List II of the State List. That entails that preventing and fighting floods is primarily the responsibility of the state governments. Many of the state have already created laws with provisions to deal with flood related issues. The Union government primarily plays the role in an advisory capacity or providing help to supplement relief and rehabilitation efforts of the states.

On detailed note a two-tier mechanism currently exists to oversee the flood management. The state

by modern technology.

Given the new challenges on the environment front and issues of misgovernance it is difficult for the states to plan flood management on their own. The Centre and the states through a joint plan should undertake various measures to control floods. This includes construction of embankments, flood walls, ring bunds, flood control reservoirs to temporarily hold some quantity of flood water to control flow of water downstream within safe limits.

Improvement of river channels and surface drainage and most importantly checking erosion of land on river banks are others measures that could help checking the spread of flood water if not preventing these altogether.

Under the prevailing circumstances and new challenges it will be naive to look at flood management as an isolated subject. It is imperative that flood control and management system is strengthened. But it is equally important that this should be seen in the light of environmental degradation, global warming and poor governance at various levels.

Any approach aimed at flood management should include all these key factors. The management cannot be done in isolation with old-time irrigation and flood control departments. The technological advancements have made it possible to generate data with precision to forecast weather related events. This could benefit in short term planning in terms of evacuation and readying the crisis management forces.

The greater focus should be laid on long term planning related to floods that should include preventive as well as relief aspects. The bigger emergency should also be on measures to arrest urban flooding which requires some steps different than what is needed to manage traditional flooding. The urban flooding is mostly the result of encroachment of land by vested interests and lack of advance planning before the rainy season. Cleaning of drains and rivulets near the cities should be accorded top priority.

(The author is senior journalist based in New Delhi. e-mail: a.anil.anand@gmail.com)