CHAPTER IV
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FLOOD HAZARD: PERCEPTION AND MANAGEMENT

Flood hazard has larger spatial impact and involves greater loss of life and property than any other hazard. In view of its disastrous impact on human life and economy, attempts have recently been made to analyse human perception towards flood hazards, with an ultimate goal of creating awareness regarding its control measures. The impact is constantly felt in the field of human adjustment in plain areas which are easily subjected to floods. Humans are attracted to settle in flood prone areas because of water supply, transportation and simple terrain. These attractions however are no more important today as water transportation is a rare thing except for bulky products, while water supply is generally obtained from underground sources through pipes. But inspite of these changes, encroachment of settlement on flood plains continues to increase to some extent due to geographical inertia whereby existing settlements continue to grow in peripheral regions. These encroachments take place without keeping in view the flood hazards, which result in severe damages in all walks of life.
Perception

Human perception of flood hazard depends basically upon the experience of flood occurrence in the past. Perception of flood may not necessarily be accurate by scientific standards but is more or less up to the mark. It gives a general picture according to the level of perception as well as intensity of flood proneness of a place. To know the perception of flood hazard it is necessary to interact with people. In doing so it was found that most of the people perceived flood as a hazard. The respondents of high flood areas such as eastern and parts of central Uttar Pradesh have more awareness or perception for flood hazard, whereas others have less perception about it simply because they do not experience flood to greater extent. The perception in study area also indicates change of flood recurrence in future and magnitude of floods as well. But this depends on the intensity of flood in an area. The more the area is prone to floods the more strong is the perception of flood hazard of the people. Human response pointed by Kates (1971) is the result of joint interaction between physical and socio-economic process and is determined partly by the nature of flood hazard and partly by the characteristics of the decision makers, whether the respondent is an individual flood plain occupant or farmer, government
official, industrial producer, etc. So the nature of the individual decision maker and of the flood hazard itself influence perception in a combined way, which can be sharp, mild or absent. The damages caused by floods consist of many aspects including structural, erosional, loss of lives and property, contamination of water, disruption of socio-economic activities like transport, communication, agricultural fields and crops etc, perception of this hazard is important and helps to know the extent for future planning. A positive response in this regard may help in modifying flood and reduce damages.

Most of the occupants of severe flood affected areas have more perception about floods and they believe that floods are hazardous. While occupants of medium affected areas have moderate perception as well as idea for floods as hazard and occupants of those areas where floods are experienced less or have no floods have a different attitude or perception, which is nearly absent and they do not take floods as hazard. This shows the direct link between experience of floods and perception about it. Similarly the occupants keep alert and have in mind flood hazard before

starting with any new project in areas where floods are severe and frequent. While occupants of lesser affected areas are ignorant about it. So a change in behaviour is seen in different intensity zones. The perception about the recurrence and magnitude also have the same pattern. The high flood zone occupants perceive that floods will recur and with higher magnitude although occupants of low intensity zone do not think over it and some have no idea, while few of them perceive that it might become less in future. As for the affinity towards flood plains the occupants are quite divided according to their occupations. There is a marked variation among them. The non-cultivator have high level of variation for affinity towards flood plains, more so after severe floods they have less preference for it. On the other hand cultivators or the landowners are attached to their lands and show very little variation even after severe floods. But they prefer to have atleast one member in non-cultivating job so as to support the family during floods. As regards perception towards advantages and disadvantages of flood, the occupants have different view for various things. The occupants have perception that floods are advantageous for agricultural purpose as it leaves behind deposits and the underground water is restored
back, but floods are a disadvantage to houses, education, accessibility, market, trade, etc. In case of health and diseases due to floods, the occupants have little idea and are divided in their views. The level of perception and awareness of occupants are according to the intensity of floods in the area and the response is quite fair.

Management

The management to floods implies not letting the excess runoff water flow suddenly and intensity into the drainage network. The measures taken are intended to reduce the proportion of runoff by increasing infiltration, spreading the excess water that manages to get into the channels and disposing it through channels or canals. The authorities in flood-prone parts announce 'preparedness before the onset of the rains, but every time the monsoon strikes they are caught by surprise. The situation has worsened more particularly since seventies. The control of floods is basically aimed at the reduction of flood damage. Flood control therefore can be achieved in a number of ways. Flood damage can simply be reduced by moving

the damageable property out of reach of flood waters. This involves adjustment by occupants and abatement. The study is based entirely on the measures taken by occupants through their perception of floods to adjust and abate with flood hazard.

Adjustment:

The idea of human adjustment to floods is not new but dates back to the time when settlements started near the rivers. And an adjustment to flood may also reduce the flood losses to a great extent that is why adjustment have greater role in managing flood damage. The study area is a good example of interaction between man and nature. As floods from time immemorial have existed here and people have devised several measures to cope with this hazard by trial and error. The adjustment can be classified as Socio-economic in nature. The economic ways of adjustments involve agriculture, livestock, fishing and other activities while social adjustments include aspects basically of houses, food, clothes etc. Afforestation is a type of main abatement method applied by the occupants. As the flooding is common in central and eastern Uttar Pradesh and to some extent in western as well as few parts of Bundelkhand areas of Uttar Pradesh, emphasis in
understanding flood adjustment is given to medium and high intensity flood zones of the state. Economic adjustment adopted by the occupants in the flood prone areas differ in the study region from place to place according to the intensity of flood in that place.

The agricultural practices evolved in the study region are the manifestation of an adjustment process between natural system and human system. The occupants have evolved methods of farming which have been adopted to cope with the seasonal rhythm of rainfall. Farmers perception about their immediate environment especially rainfall and floods determine the pattern of land use. The agricultural activities in flood prone zones have some common features i.e. farmers have consideration for higher agricultural returns. They are less concerned about the quality of produce. It was observed that the farmers mostly grow crops that are ecophysiologically adapted to the region. They grow such combinations which can stand drought conditions as well as floods. It is also observed that farmers produce Kharif crops with minimum investment due to frequent flood danger. So that comparatively less damage is caused by floods in economic sense. Floods have impact on crop combination and also on area under different crops. It was noticed that arhar, kodan, maize and jowar are grown together. In this case jowar can resist
floods to greater extent than other crops. Special variety of paddy like Naugajia is sown which can resist high to very high floods and grows very fast. In areas of high flood intensity farmers are not able to cultivate nearly half of the land in kharif season and that usually they use the land only once or twice and do not use fertilizers for production of crops as they might be washed away by floods. Whereas farmers of flood prone zones depend largely on rabi crops as these crops are benefited by floods by recharging soil fertility and moisture content. Wheat, gram, peas, barley etc. are grown extensively. The area under wheat cultivation has increased. The area under zaid crops is very low in flood plains. They are only grown on low lands along the river courses. Crops like water melon, cucumber etc. are important zaid crops. Whatever precaution may be taken still the agricultural produce and the farmers do suffer as the floods are sometimes in early monsoon and they spoil the seeds. Whereas, the floods of later monsoon spoils the crop. So the farmers have tried to know the suitability of the agricultural lands at micro level vis a vis climatic factors for producing various crops. This gives way to possible efforts for agricultural adjustment to the flood hazard.

In study area the medium and high intensity flood zones have considerable area under pasture
because of the presence of lowlands. As farming depends less on livestocks these days, the only livestocks which are kept are milch cattles like goats, sheep, cows, etc. These cattles have enough fodder from grasslands. The occupants keep these cattles for economic benefits rather than for agricultural purposes. During floods people face difficulty of feeding their cattle as the fodder storage is minimal. Very few people maintain fodder stock. As floods take time to recede, they are unable to feed their cattle and due to prolonged flood period most of the people sell off their cattle due to fodder problem during flood times. This is due to the fact that fodder storage facilities are not enough and then the flood waters after receding leave behind contaminated grasses and land, which leads to diseases for cattle. A sizeable number of people shift their cattle to near by places during flood period or to their relatives i.e. to the places which are not flood affected areas. Yet some people keep their cattle in government protected sheds. So this shows the adjustment of occupants with flood hazard.

A large number of people in study region especially in the eastern Uttar Pradesh are engaged in fishing as the presence of lakes, rivers and their tributaries provide favourable conditions for fishing.
A particular community of people known as 'mellah' carry out this practice. They like to settle down near water bodies. The concentration of these fishermen is high in flood prone areas of the state. These people have well adjusted the flood hazard as they know swimming and also have their own boats. By and large these people depend on this occupation and do not like to change it. Some of them are equipped to do business at large scale. It is also seen that people of flood prone areas are attracted towards other economic activities such as secondary or tertiary activities. These people migrate to near by industrial areas for job. And as they are uneducated and unskilled, they mostly get engaged in low paid occupation. Flood prone areas are not so developed as businessmen do not like to take the risk of setting up industries in such areas. It is also observed that every family wants at least one member of the family should have job in secondary or tertiary sectors so as to support the family in flood times, because agriculture and livestock is affected by floods. As occupants are trying their best to adjust with flood hazards government should also help them by providing better aid and opportunities in economic sense.
Although people of flood prone zones are more involved in improving their economic condition but to some extent they are also concerned with their social well being. Social aspects begin with houses is important part of one's life. The problem of housing is acute in flood zones in the study region. It is observed that majority of houses are uncemented and some of the houses are cemented. A number of houses are in the form of huts. The reason is that the occupants do not want to take the risk of making cemented houses and spend much money due to recurring flood danger. Because damage to uncemented houses, is easy to repair with low cost. While economically strong occupants of flood prone areas have made concrete houses with raised plinths above flood level. But such people are small in number. People have adjusted to medium and low flood level but have still to adjust to high flood level, which require more financial and technical assistance.

Health is to be looked after as the contamination of water from decomposed plants, animals and numerous other dead organisms makes the entire environment of flood hit area unhygienic. These conditions give rise to various diseases like diarrhoea, dysentry, cholera, fever etc. in flood prone areas. The occupants of high
flood zones have developed some immunity to these diseases but the areas which get less floods are more prone to these diseases. Children and old people are greatly affected. The situation is brought under control by the medicines and food material supplied by the government.

Education is affected by recurrence of flood at lower level schools, which are often closed when the nearby area is flooded. The situation ultimately is reflected in low levels of literacy in the flood prone areas. Higher education also at times is affected.

Abatement:

Abatement is to reduce the severity of floods and the occupants depend on afforestation in a way of reducing surface runoff and controlling soil erosion. It also helps in ground water recharge. People are aware of the usefulness of forests. Their responses revealed that forest cover is capable of controlling flood to a great extent. They showed a positive liking for planting trees. A high number of people blamed deforestation as the main cause of flood occurrence and their severity. People realize that plantation can solve the flood problem to some extent and that some steps have already been taken to plant trees in the last
two decades, particularly in flood affected areas. It is noticed that the number of trees are increasing from 1973. The department of social forestry which started in 1965 looks after the plantation of trees. Although plantation is on an increase yet the cutting down of trees is also going on side by side, this practice needs to be checked so that the area under forests may increase.