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## FLOOD HAVOC AND ITS STRATEGIC MANAGEMENT FOR ENHANCING FARMERS INCOME IN BARAK VALLEY ZONE OF ASSAM

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### *Abstract*

*Agriculture is the most important source of economic aid and prime factor in growth and development of India. It provides livelihood to about 50 per cent of the labour force and contributes nearly 17-18 per cent in the GDP according to Economic survey of India (2018). In Assam, more than 70 per cent of the total population gets their means of livelihood from agricultural sector. More ever natural hazards such as flood have significant impact on agriculture. The European Union (EU) Floods directive (2007), defines flood as a temporary covering by water of land that is not normally covered by water, in the sense of "Flowing water", the word may also be applied to the inflow of the tide. Floods in Assam which occurred in July 2017 affected 17, 43,119 population across 26 districts. 86,223.19 hectares of crop area was affected in 2450 villages under 81 revenue circles with official death figures rising to 83 till July 30th. 123 relief camps and 259 relief distribution centres were operational as on 13th July 2017. The loss to agricultural land is estimated to be about 2, 08,932.44 hectares due to flood (ASDMA,2017).*

**Key Words:** *Flood, Strategic Management, Losses, Stakeholders.*

### **Introduction**

The river Barak and its tributaries causes flood every year leading to various kinds of losses like loss of human life, Communication networks, Agriculture Crops, Irrigation, Drinking Water sources, Power, Health Services, Educational Institutes, Livestocks etc. There is a strategic management plan for the flood. It consists of different district stakeholders, forming a 4-tier teams operating in the barak valley. It provides logistic support, financial assistance and technological efforts to

minimize and control flood problems. Again specific measures for flood affected farmers in Barak Valley are taken by different governmental and non-governmental organizations such as District Agriculture offices, District Animal Husbandry & Veterinary office, ICAR, Assam Agricultural University, KVKs and RARS, Nehru Yuva Kendra etc.

Agriculture is the most important source of economic aid and prime factor in growth and development of India. It is the main

source of food supply and occupation for the major portion of country's population which resides in rural areas. It provides livelihood to about 50 per cent of the labour force and contributes nearly 17-18 per cent in the GDP according to Economic survey of India (2018). In Assam, Agriculture is the primary sector of its economy. More than 70 per cent of the total population in Assam gets their means of livelihood from agricultural sector. The agriculture is influenced by a range of social, economic and environmental factors. . Every year during the successive waves of floods, thousands of people are rendered homeless, causing widespread damages of agricultural crops, properties (public and private) including communication system between regions and leads negative impacts in the economic activities (Manoranjan Gogoi, 2016). Flood and erosion problems in Barak valley is a major cause of concern. Every year there is colossal flood losses in the valley. Nearly 3.50 lakh hectares of land area in the valley is flood prone and protection against damages is available to 57% of the areas only. The valley is characterized by excessive humidity and the average rainfall of the zone is 3180 mm with average rainy days of 146 per annum (Bhattacharjee and Dutta, 2010). More ever natural hazards such as flood have significant impact on agriculture. Flood has dramatic impacts on natural resources, economic activities, food security, health and physical infrastructure. The flood prone area of the state as assessed by the Rastriya BarhAyog (RBA) is 31.05 lakh hectares against the total area of the state 78.523 lakh i.e. about 39.58% of the total land of Assam and this the area about 9.40% of total flood prone area of the country. Flood is the major recurrent natural disaster of Assam. Every year during the successive waves of floods, thousands of people are rendered homeless, causing widespread damages of agricultural crops, properties (public and private) including communication system between regions and leads negative impacts in

the economic activities (Manoranjan Gogoi, 2016). Keeping in view the importance of agriculture and impact of flood the seminar was delivered with the objectives:

#### Objective of the Study

1. Assess the flood situation in Barak Valley Zone of Assam
2. Flood management plan of the Barak Valley with specific measures for enhancing farmers income

#### Flood situation in Assam

- The flood prone area of the state as assessed by the Rastriya BarhAyog (RBA) is 31.05 lakh hectares against the total area of the state 78.523 lakh i.e. about 39.58% of the total land of Assam and this the area about 9.40% of total flood prone area of the country. During post independence mainly after the 1950's earthquake, Assam faced major floods in 1954, 1962, 1972, 1984, 1988, 1998, 2002, 2004, 2012 and 2017
- Floods in Assam which occurred in July 2017 affected 17, 43,119 population across 26 districts. 86,223.19 hectares of crop area was affected in 2450 villages under 81 revenue circles with official death figures rising to 83 till July 30th. 123 relief camps and 259 relief distribution centres were operational as on 13th July 2017. The loss to agricultural land which is estimated to be about 2,08,932.44 hectares due to flood is a massive blow to the farming community whose primary source of livelihood vanished in the blink of an eye. Furthermore, the riparian community whose secondary occupation is on fishery also suffered a great loss with the pond overflowing. Livestock which is part and parcel of the life of the people are hard hit by the flood as they remain exposed to the contaminated flood water and fodder running out of stock (Ref. ASDMA, 13th & 30th July, 2017). Government of India along with state government has taken various steps and approaches to mitigate the flood victims.

#### Damage due to Flood in India

Year	Area affected in m. ha.	Population affected in million	Damage to Crops	Damage to Houses - Nos.	Cattle Lost Nos.	Human live Lost No	Total damages in Rs. Cr.
2015	4.478	33.203	3.374	3959191	45597	1420	57291.10
2016	7.065	26.555	6.658	278240	22367	1420	5675.325
2017	5.742	18.644	5.104	1152959	6899	2014	18859.39

**Assess the Flood Situation in Barak Valley Zone Of Assam, Barak Valley Zone**

Barak valley (latitude 24°8' to 25°8' N and longitude 92°15' to 93°15' E and with altitude of 31.40 m from the mean sea level) is situated in southern part of Assam State, India. Geographical area of 6,922 km<sup>2</sup> (8.84% of state) with three districts, viz. Cachar, Hailakandi, and Karimganj. Cachar district alone accounts for 57.4% of the total area; the shares of Hailakandi and Karimganj district being 19.2% and 26.1 % respectively. The region is named after the Barak river. It is bounded on the north by the North Cachar Hills of Assam and Jaintia Hills district of Meghalaya; on the east by Manipur; on the south by Mizoram and on the west by Tripura and Sylhet district of Bangladesh. The total population of Barak Valley as per the census Report (2011) census was 29,88,797 with a literacy rate of 56.6%. The valley is characterized by excessive humidity and average rainfall of the zone is 3180 mm with average rainy days of 146 per annum (Bhattacharjee and Dutta, 2010)

**Flood situation in Barak Valley**

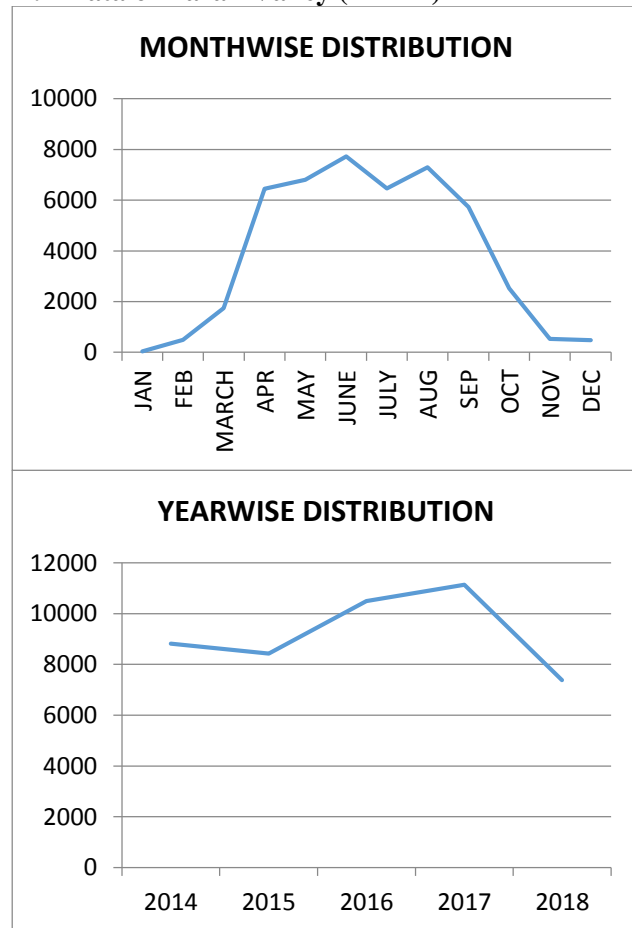
Time of occurrence - April – Sept. Flood and erosion problems in Barak valley is a major cause of concern, every year there is colossal flood losses in the valley. Nearly 3.50 lakh hectares of land area in the valley is flood prone and some protection against flood damages is available to 57% of the flood prone areas only. There are 26 nos of major sluice gates in the valley and approximately 738 km long embankments along the main river and its tributaries. But, as most part of these embankments has outlived the life span the embankments develop large breaches regularly during monsoon seasons causing huge flood damages. The Barak river system is second largest system in the North Eastern region of India. The river system drains 26,193 Sq. Km in India with approximately 6562 Sq. Km from the state of Assam. Have a large number of minor tributaries and 20 major tributaries. The Barak River rises in the Indian state of Nagaland at an elevation of approximately 2,300 meters and passes through the Manipur Hills of Manipur state, first in a southwesterly and then in a northerly direction, over a river

length of nearly 400 kilometers. It then flows generally westward from Lakhipur through the Cachar Plains region of Assam over a river length of approximately 130 kilometers to enter Bangladesh near Bhanga. The drainage area of the Barak River is approximately 14,500 square kilometers where it enters the Cachar Plains and 25,000 square kilometers where it divides at the Bangladesh border. The river Barak and its tributaries plays the uneven role of flood in every year

**Some of the main factors that acting singly or in combination causes flood in the valley are:**

- (i) High incidence of rainfall, (ii) Deforestation in the upper catchments (iii) Inadequate natural drainage system (iii) Reduction in natural reservoirs (iv) Heavy encroachment in the riverine area (v) Large scale construction activities without proper planning

**R.F Data of Barak Valley (In mm)**



YEAR	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV	DEC
2014	0	60.9	107.7	373.8	1682.5	1736.4	1766.3	1353.3	1470.7	259.9	2.8	0

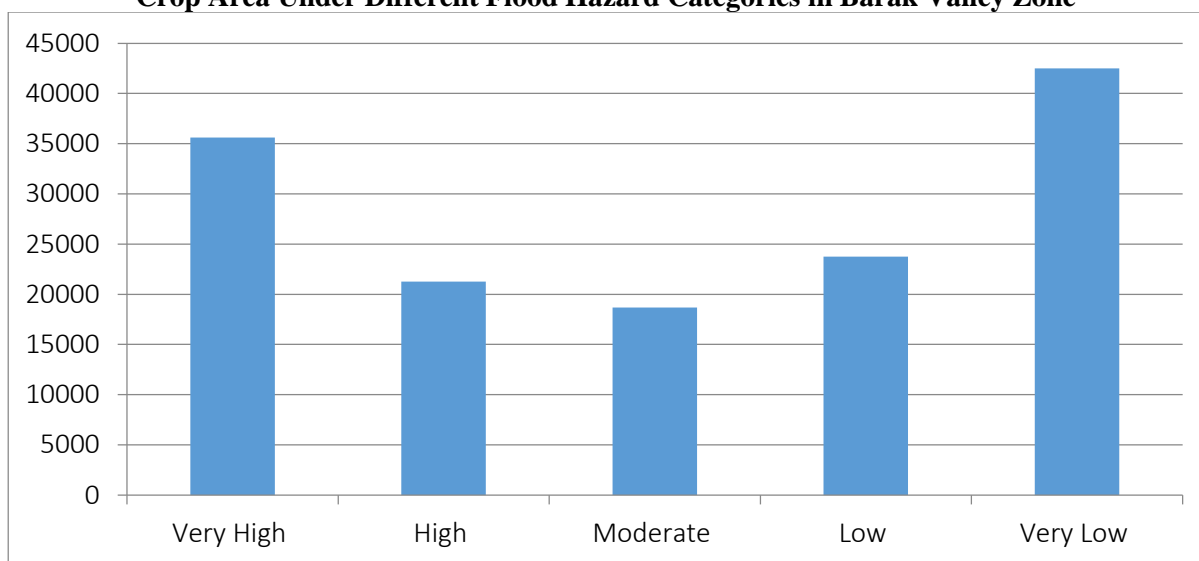
2015	10.7	40.9	77.9	1465.5	1055	1243.7	1112.4	1938.7	1044.1	358.2	41.7	38.8
2016	20.4	186.2	244.6	2285.7	1796.9	1281.1	1308.6	974.1	1444.7	516.1	405.1	37
2017	0	160.8	959.1	1653	1139.9	1984.8	1313.5	1806.8	765.2	1002.9	46.5	311
2018	12	39.8	349.7	675.1	1125.5	1472.4	962.6	1224.5	1006.1	387.8	35.7	92.5

**Impact of flood in Barak Valley**

Loss of human life, Affects Health Services , All Agricultural & Horticultural Crops,Power Supplies - Electric poles, transmission cables, Irrigation Sources - Minor Irrigation Projects, Infrastructures - Residential, commercial &Industrial Developments, Educational Institutes - Private & Public schools and institutes, Livestock - Mithuns, Pigs, Cows, Buffalos, Goats, Poultry

Farms, Fish Farms, etc,Drinking Water sources, Pipelines, Water Treatment plant, Hand-Pumps and causes Siltation. Also affects Communication network - Road network, Bridges, Ferry Services, Tele-communications. The vulnerable People - Handicapped, Fishermen, Old/Aged, Pregnant, Sick and ailing/diseased, Children below 5 years.Other vulnerable assets - Saw Mills, Small scale industries,/ orchards & forest

**Crop Area Under Different Flood Hazard Categories in Barak Valley Zone**



**Losses due to flood in Barak Valley during 2018, as on 25<sup>th</sup> June 2018**

No.s	Cachar	Hailakandi	Karimganj	Total
No. of villages affected	173	231	314	718
Total cropped area affected (ha)	961	1,890.65	1,150	4,001.65
Population affected	1,06,259	2,05,520	2,36,914	5,48,693
Animals affected	1,52,551	2,03,900	2,84,570	6,41,021
Houses damaged	749	1,902	1,425	4,076
Human lives lost	2	2	1	5
No. of ponds submerged	545	799	1130	2474

### Other losses due to flood in Barak Valley during 2018

Severe Breach like damage in the rivers Singla, Longai and Kathakal 24 roads in Cachar, 24 roads in Karimganj and 13 roads in Hailakandi were submerged for more than 7 days .NH 154 submerged in flood water for almost one week

### Flood Management Plan of the Barak Valley with specific measures for enhancing Farmers Income, Structure of DDMA

Members of the District Disaster Management Authority, Cachar, Assam

1. Deputy Commissioner, Cachar  
Chairperson
2. President, Zilla Parishad, Cachar  
Co-chairperson
3. Addl. Deputy Commissioner (DM) cum  
CEO, DDMA, Cachar Member Secretary.
4. Superintendent of Police, Cachar Member.
5. Project Director, D.R.D.A., Cachar  
Member.
6. Joint Director of Health Services, Cachar  
Member.
7. Exe. Engineer, PWD, Rural Roads Div,  
Cachar Member.
8. Exe. Engineer, Water Resources, Cachar  
Member

### Framework Plan

1. Short Term Management ( $\leq 90$  days) in case of flood Evacuation to safer places (which will include minimum basic amenities) medical facilities, common kitchen, common shelter, construction of temporary shelter and drainages, trauma counseling, Reopen/re-establish all schools, offices and business establishments
2. Long Term Management ( $> 90$  days to 3 years) in case of flood Construction, repair, maintenance of infrastructures (buildings, roads, bridges, drainages, sewages), retrofitting of old structures, provide awareness, training, capacity building including mock drills. Activate employment generation activities. Reopen/re-establish all schools, offices and business

### Few Specific measures for flood affected farmers in Barak Valley

- a) Stakeholders
- b) District Agriculture offices
- c) District Animal Husbandry & Veterinary Officer
- d) Indian Council of Agricultural Research
- e) Krishi Vigyan Kendra (Hailakandi)

- f) Assam Agricultural University
- g) Krishi Vigyan Kendras (Cachar and Karimganj)
- h) Regional Agricultural Research Station (Karimganj)
- i) Non-Governmental Organizations

### Some successful technologies

Since recurrent flood is most common phenomenon in the Barak Valley which usually occurs during the month June to September, it damages winter (Sali) rice. To overcome this menace of flood during Sali rice period a submergence tolerant paddy variety i.e. Jalashree developed by RARS, Titabar is popularized through Agriculture Dept and AAU.

The variety gave an impressive yield of 41 q/ha compared to the yield of local variety which was only 26 q/ha. The BCR of local Sali rice variety was 1.90 which was increased to 2.38. The variety is widely accepted by farmers

Rice is the main crop of this zone which faces erratic rainfall with occasional hailstorm during March- April and heavy rainfall during June- August frequently damaging both *Ahu* and *Sali* rice. Rice variety Dishang was popularized as the variety characterized by short duration and can escape the above problem. It yielded 37 q/ha which was 32.43 per cent higher than local Ahu rice variety of 25 q/ha. It is observed that the BCR of 'Disang' 2.15 which was more than the local variety recorded as 1.83. The same variety is grown as post flood crop, after receding of the flood water. It is one of the most successful technologies adopted by farmers

To upgrade the living standard of farmers, a subsidiary source of income. It helps farmers to cope up from any loss of crops due to flood and/or other reasons and adds volume to the total income. Improved poultry breed Vanaraja was introduced among the farmers. Vanaraja found to be well adapted to the local climatic conditions. It gave very encouraging growth performance compared to the local breeds. When 6 months, the body weight of male- 3.3 kg (almost 2.5 times more) Recorded 400 eggs/layers for first 2 years (200 percent higher) BCR for Vanaraja - 4.05 against the 3.79 of the local breed. The breed gradually contributed a significant outcome of the farmers, which encouraged them to produce chicks locally by incubating the eggs of introduced breed with local hens.



One of the popular livelihood means in Barak Valley is the cultivation of Murta plants, also known as seetalpati. Many designed accessories like bags, belts, caps and mats etc are made from its product. Krishi Vigyan Kendra has implemented a project for enhancing the production and productivity of Murta plants. It was funded by the SIRD. The project was implemented in one of the village where demonstration on proper cultivation was given and infrastructural facilities for preparation of crafts were made. This is one of the important and specific income sources in the valley. Due to the implementation of the project the farmers were benefitted to a significant extend.

#### **Conclusion**

Flood has devastating consequences and negative impacts on the people, agriculture, infrastructure, environment and the economy. For the development of the flood affected regions, such specific technologies need to be adopted and the natural resources should be properly managed. While natural hazards cannot be prevented, measures can be initiated for preventing hazards from turning into disasters by strengthening the coping capacity of the communities. The government needs to identify flood hazard and potential flood risk from all sources as the initial stage of

planning. The efficacy of plans and measures need to be scrutinized with the involvement of the people from flood affected area

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