Atik Sir

3 ques

Flood Management

1 credit

[15-06-26]

lec-1: Overview of flood, Types, Risk of flood

- Flood:
- Types:
  - Levee → Natural
  - Floodwall, Polder → Artificial
- Geographical, Physiological, Hydrometeorological factors responsible for floods in Bd.
  - Normal flood ~ 20% inundation
  - Abnormal flood > 20%.
- Flood inundation map.
- 3d → Lower riparian country.

Saltwater intrusion in south portion (Patuakhali, Barisal) due to loss of thrust of Padma river.

Loss of Thrust of Padma river due to construction of Farakka Barrage.

80% area of Bd → Floodplain

Key determinants of extent of flooding:

Magnitude

Synchronization of peak

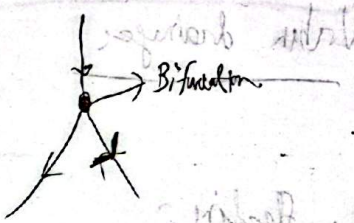
Duration of flood in the main river

1988 → 14 days (More magnitude)

1998 → 70 days (Lesser than 1988)

29-05-26





Lec-2: Flood Process in Urban & Rural area

Curve Number (CN): 0–100

CN ↑ → Runoff ↑

CN=100 → 100% Runoff

CN=0 → 100% Infiltration

Generally 30–95.

Less imp

Urban drainage:

Def

Urban flooding:

Impact of Urban flooding:

[06-07-26]

* Urban → SWMM
  Rural → HEC-HMS
  (Hydrology)

* HEC-RAS
  (Hydraulic)
  & Bathymetry

Lec-3: Flood management measures

VI Imp

Planning for flood management:

Mitigation
Preparedness
Response
Recovery

VI Imp

Measures for flood control:

Structural
Non-Structural

Dam & Reservoir

Not imp

* Fig of Dam (Components)

Dry dam

Lec-4 : Diversion Channel

[20-07-26]

- Adv & Disadv of diversion channel [27-07-26]
- Types:
  - # Temporary
  - # Permanent
- Design Consideration :
- Design of flood bypass :
- Flood wall :

[Mid-3,4]

Lec-5: Dredging

[10-08-26]

- Purpose of Dredging :
- 3 steps of dredging :
  - # Pretreatment
  - # Excavation
  - # Disposal
- Types of dredging :
  - # Mechanical dredging
  - # Hydraulic dredging
- Types of dredgers
- Impacts of dredging :
- Gorai River

Lec-6 : Land management

- Water shed
- Problems associated with watershed
- Watershed management
- Watershed development & modelling

[17-08-26]

- Concept of IWM
- Tools for effective water management.
- Water conservation
- Rainwater harvesting
- Land use plan chart

Lec 7 : Flood proofing

[24-08-26]

- Considerations for developing flood proofing strategies.
- Methods of flood proofing (FEMA guidelines)
- Case study

[31-08-26]

Lec-8 : Flood zoning

- $\text{Probability} = \frac{1}{\text{Return period}}$
- DAP = Detailed Area Plan
- Risk & Probability
- Flood Zone classification:
  - # 1
  - # 2
  - # 3a
  - # 3b
- Page 14 to 17

CamScanner

Approaches of flood zoning:

Historic approach
Conventional approach
Modeling approach

[07-07-23]

Lec-10, Flood Forecasting

Imp

Role of flood forecasting in flood management

* Page-19-23

Numericals

Lec-11 - Flood Damage Assessment

Imp

Types of damage:

(i) Tangible → Direct, Indirect
(ii) Intangible

[14-09-25]

Economic evaluation of flood mitigation projects:

Cost/Benefit Approach
Fixed Cost Approach
Multi objective Approach.
Cost Effective Approach
Non economic Approach.

Disaster Relief:

Short Term recovery program.
Long term recovery program.

Lec-9: Flood Hazard Mapping

[21-09-26]

Flood risks:

Flood risk analysis:

(Numerical)

$D = \Sigma EVH$

$R = \frac{\Sigma (H \cdot P \cdot D)}{\text{area}}$

$H = \frac{1}{T}$

T = Return period
E = Elements of Risk
V = Vulnerability
H = Assessment of hazard
D = Assessment of probable damage from a hazard
R = Risk (Money / Yr)

Case Study

* Eg:

	T	D (million tk)	D (million Tk/yr)
Frequent :	10	8	D_{10}' (50% ↓)
Moderate :	20	15	D_{20}' (50% ↓)
Severe :	50	35	D_{50}' (25% ↓)
Extreme :	100	70	D_{100}' (No effect)

After building embankment

(a) R = ? If there is no embankment.
(b) R = ? After building embankment.

Sol^n:

(a)

D/T
8/10
15/20
35/50
70/100

$R = \Sigma \frac{D}{T} = 2.95$.

N.B.: 1. Instead of D; E & V may be given.
2. Initial = 10 million Tk/yr, After project = 8 million Tk/yr; Benefit = 2 mil Tk/yr; Cost = 3 mil Tk/yr. BCR = 2/3 < 1 (Loss)
3. Total project cost / Construction period = Money / Yr.

Brief

Lec-1: Diff types of flood, Geomorphological factors

Lec-2: Causes & impact of urban flooding.

Lec-3: Measures, Structural & Non structural, Barriage, Beaver dam, Certain dams

Lec-4: Flood diversion channel adv & disadv.

Lec 5: Impact of dredging, Morphological change.

Lec-6: Watershed management

Lec-7: Method of flood proofing, Consideration.

Lec-8: Flood zoning & classification

Lec-9: Numericals

Lec 10: Def of Flood Forecasting, Flood warning, Role, Data requirement.

Lec-11: Tangible & Intangible, Direct & Indirect, Damage assessment with exp

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