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Integrated Watershed Management

An Introduction

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WATERSHED?

- Watershed ⟶ catchments area; basin

"A delineated area with a well-defined topographic boundary and water outlet"

  - Hydrological unit
  - Hydrological process
    - (infiltration, runoff, seepage flow, evapotranspiration)
  - Wadi or a river drained to a reservoir (a well defined point)
  - One stream or a complex of stream networks
  - Range in size 1,0 km^2 ----1000,000km^2

- Soil erosion processes
  - (detachment, transport, deposition)
- Soil and water pollution
- Soil degradation due to socioeconomic and political factors
- A complex of soil, landforms, vegetation and land uses

"Both hydrological and ecological processes govern the quality of soil and water resources"

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Why Watershed Management

- Main reasons of the decline in agricultural productivity
  - Water scarcity and poor quality
  - Political and social factors
  - Lack of appropriate technology

- Principal reasons for Watershed management
  - Decrease in per capita arable land
  - Natural resources degradation
  - Desertification
  - Tropical deforestation

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Watershed components

1- Water resources

- Hydrological modeling- Surface Water and baseflow
  - Resources Assessment
  - Extreme values
- Groundwater (natural water recharge)

2- Soil and land cover

3- Land Use

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4- Water abstraction and harvesting

- Diversion dams and wadi abstraction
- Artificial recharge
- Other methods of water harvesting
  - traditional
  - modern

5- Water use

- Irrigation
  - Spate
  - Alternative types of irrigation (modernized)
- Domestic water use

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6- water allocation

- water rights
- Upstream- downstream conflicts
- conjunctive use
- land ownership
- Water user associations

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7- Flood protection

- Village protection
- Agricultural land protection
- Infrastructure protection
- Wadi training

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8- Wadi management constraints

- sedimentation
- urbanisation
- newly developed structures (versus traditional)
- water quality considerations
- water and poverty

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9- Socioeconomic of the watershed

10- Institutional aspects

11- Agricultural rule in the watershed management

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- Reference to Case studies

  Examples : Successful versus unsuccessful sustainable watershed management

- Exercises and practical (possibly to be includes in the case studies)