

**द्वितीय पत्र - सेवा सम्बन्धी प्राविधिक विषय**

**पूर्णाङ्क:- १००**

1. Introduction
  - 1.1 Irrigation development in Nepal
  - 1.2 Irrigation project planning including multipurpose projects
  - 1.3 Participatory approach in irrigation development
  - 1.4 Feasibility studies and investigations
  - 1.5 Water Resources Potential and Perspective
2. Irrigation Design
  - 2.1 Irrigation water requirement
  - 2.2 Water availability and water balance
  - 2.3 Design and design considerations of irrigation system – head works, canals, cross drainage works, water regulating structures, Farm drainage and drainage structures, specific features in designing irrigation systems in hills and mountains
  - 2.4 Environmental issues in irrigation design, policy provisions for Initial Environmental Examination and Environmental Impact Assessment;
3. Ground water Development
  - 3.1 Overview of ground water potential in Nepal
  - 3.2 Ground water exploration
  - 3.3 Design of water wells – deep, shallow and other low cost techniques
  - 3.4 Well construction and development
  - 3.5 Conjunctive use
4. Water Induced Disaster
  - 4.1 Types of Water Induced disasters and Vulnerability
  - 4.2 Floods, causes of occurrence, and mitigation measures
  - 4.3 Prevention measures for water induced disaster
  - 4.4 Inundation Problem in Nepal
5. River Engineering
  - 5.1 River and flood plain management
  - 5.2 River Hydraulic and sediments transports
  - 5.3 River channel improvement and flood control design planning
  - 5.4 Design of flood control works viz longitudinal and transverse dikes, bed bars, cut-offs etc.
6. Construction of Irrigation Projects
  - 6.1 Methods and construction technology
  - 6.2 Contract management and quality aspects of construction
  - 6.3 Environmental protection issues in developing irrigation systems
  - 6.4 Participatory approach in the construction of irrigation projects
  - 6.5 Quality control and assurances

7. Irrigation Management and Sustainability

- 7.1 General concepts of irrigation management
- 7.2 System operation and maintenance
- 7.3 Operation / regulation of head works
- 7.4 Types of irrigation systems with respect to their management & their performance
- 7.5 Participatory irrigation management and stakeholders involvement
- 7.6 Joint management concept and sustainability issues
- 7.7 Irrigation Management transfer, process and outcomes of management transfer
- 7.8 Private sector management of irrigation

8. Economics, Resource Mobilization and Administration

- 8.1 Economics of irrigation
- 8.2 Resource Mobilization in Irrigation Sector
- 8.3 Economic analysis of irrigation projects
- 8.4 Institutional strengthening
- 8.5 Contract Dispute resolution

9. Implementation and Policy Issues

- 9.1 National Policies and effectiveness in implementation
- 9.2 Involvement of NGOs in Irrigation
- 9.3 Development of Non-conventional irrigation systems
- 9.4 Integrated approach of crop water management

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