

# Water Resources System and Management

Introduction: General Principles of Systems Analysis to Problems in Water Resources Engineering, Objectives of Water Resources Planning and Development, Nature of Water Resources Systems, Socio Economic Characteristics.

Economic Analysis of Water Resources System: Principles of Engineering Economy, Capital, Interest and Interest Rates. Time Value of Money, Depreciation, Benefit Cost Evaluation, Discounting Techniques, Economic and Financial Evaluation, Socio-Economic Analysis.

Methods of Systems Analysis: Linear Programming Models, Simplex Method, Sensitivity Analysis, Dual Programming, Dynamic Programming Models, Classical Optimisation Techniques, Gradient Techniques, Stochastic Programming, Simulation, Search Techniques, Multi Objective Optimisation.

Water Quantity Management: Surface Water Storage Requirements, Storage Capacity and Yield, Reservoir Design, Water Allocations for Water Supply, Irrigation, Hydropower and Flood Control, Reservoir Operations, Planning of an Irrigation System, Irrigation Scheduling, Groundwater management, Conjunctive Use of Surface and Subsurface Water Resources, Design of Water Conveyance and Distribution Systems.

## References:

1. Loucks, D.P., Stedinger, J.R. and Haith, D.A. "Water Resources Systems Planning and Analysis", Prentice Hall Inc. N York
2. Chaturvedi, M.C. "Water Resources Systems Planning and Management", Tata McGraw Hill Pub. Co., N Delhi.
3. Hall, W.A. and Dracup, J.A. "Water Resources Systems", Tata McGraw Hill Pub. N Delhi
4. James, L.D. and Lee "Economics of Water Resources Planning", McGraw Hill Inc. n York
5. Kuiper, E. "Water Resources Development, Planning, Engineering and Economics", Butterworth, London
6. Biswas, A.K. "Systems Approach to Water Management", McGraw Hill Inc. N York
7. Major, D.C. and Lenton, R.L., "Applied Water Resources System Planning", Prentice-Hall Inc, N.Jersey
8. Taha h A, "Operations Research", Prentice Hall of India, N Delhi.