CONTENT

1.	Water Resources Availability and Requirements of India	1-6
	 Global Water Resources; Water Resources of India; Precipitation Variability; Surface Water Resources of India; Groundwater Resources 	
2.	Fresh Water and its Management in India	7-15
	● Freshwater Related Problems in India; ● Uneven Distribution of Water Availability; ● Water Pollution; ● Excessive Groundwater Exploitation; ● Threat to Biodiversity and Wetlands; ● Strategies for Freshwater Management in India; ● Water Conservation; ● Watershed Management; ● Water Quality Conservation and Environment Restoration; ● Inter-basin Water Transfer (IBWT); ● Groundwater Management; ● Rainwater Harvesting; ● Recycle and Reuse of Water; ● Desalination of Water; ● Environmental Flow Requirement (EFR); ● Dealing with Climate Change;	
3.	Watershed Management	16-24
	 Introduction; Concepts of Watershed; Concept of Watershed Management; Introduction; Principles of Watershed Management; Scope of Watershed Management; Need of Watershed Management; Value Added of Watershed Management 	
4.	Components of Watershed Management	25-30
	 Components of Watershed Management; ● (i) Land Management; ● (ii) Water Management under Watershed Management; ● (iii) Biomass Management; Watershed Management Practices 	
5.	Integrated Watershed Management	31-39
	 Principles of Integrated Watershed Management; ● The Strategy; ● What is Integrated Watershed Management (IWMP); ● Key Points of IWMP; ● Objectives of Integrated Watershed Management; ● Integrated Watershed Management Planning; ● Developing Integrated Watershed Management; ● Vision for Integrated Watershed Management and the Sustainable use of Natural Resources; ● Integrated Wasteland Problem & Consequences; ● Social & Economic Concern of Integrated Watershed Management; ● Benefits of IWM with respect to socio-economic aspects; ● Socio-economic Challenges to Successful Watershed Development and Management 	
6.	Characteristics of Watershed Management : Classification & Measurement	40-46
	● Characteristics of Watersheds; ● Classification of Watershed; ● Watershed Characteristics: Physical and Geomorphologic Characteristics associated with Watersheds; ● Quantitative Characteristics of Watersheds;	
7.	Factors Effecting Watershed Management	47-49
	● Effect of Physical Factors on Watershed Management; ● Size; ● Shape; ● Topography; ● Drainage; ● Area of the Watershed; ● Length of Watershed; ● Slope of Watershed; ● Effect of Geomorphologic Factors and Associated Processes on Watershed Management	
8.	Runoff & their Management in Watershed	50-56
	● Introduction; ● Definition; ● The Runoff Process; ● Forms of Runoff; ● Factors	Y Salak

9.	Soil-Water Plant Relationships	57-70
	 A. Nature of Soil Water; ● B. Movement of Irrigation and Drainage Water in Soil; C. Infiltration (Intake) in Relation to Irrigation; ● D. Available Water Holding Capacity; ● E. Water Absorption by Plants; ● F. Rooting Characteristics in Relation to Irrigation; ● G. Consumptive Use of Water 	191
10.	Land Capability Classification	71-79
	 Purpose of Land Capability Classification; ● Classification-Scheme; ● Mapping of Land Capability Classes; ● A. Land Suitable for Cultivation; ● Gully Classification; Land Capability Classification for Ravine Lands; ● Specific use and importance of Air Photographs in Agriculture 	
11.	Water Requirements of Crops	80-86
	 Definition of Irrigation; ● Necessity of Irrigation in Our Country; ● Importance or Necessity of Irrigation for Plants or Crops; ● Advantages of Irrigation; ● Disadvantages of Irrigation; ● Transpiration; ● Evapo-transpiration or Consumptive use of Irrigation Water; ● Water Requirements of Crops; ● Definition; ● Crop period or Base period; ● Duty and Delta of a Crop; ● Duty of Water; ● Relation between Duty and Delta; ● Factors affecting Water Requirements; ● Consumptive Irrigation Requirement; ● Net Irrigation Requirements; ● Efficiency of Water use 	
12.	Soil Loss/Soil Erosion	87-92
	Stages of Gully Development	
13.	Factors Affecting Soil Erosion/Loss	93-95
	Kinds of Soil Erosion	
14.	Wind Erosion	96-104
	Control of Wind Erosion	
15.	Socio-Economic Concept of Watershed Management	105-115
	 Concept of Watershed Management; Economic Concept of Watershed Management; Benefits; Costs; Mathematics of Economic Analysis; Concept of Time and Money; Discounting Factors; Cash Flow; Discounting Techniques; (1) Present Worth Method; (2) Benefit-Cost Ratio Method :; (3) Rate of Return Method; Costs-Benefit Analysis; Principles of Cost Benefit Analysis 	
16.	People Participation in Watershed Management	116-144
	 Weaknesses in the Conventional Approach of Watershed Management; ● Rural Appraisal and Peoples' Participation; ● The Global Approach and the People's Role; ● People's Participation and Local Development; ● Participatory Rural Appraisal Approach in Watershed Management; ● Evolution of PRA and its development; ● Political Institutional Framework in India and Various Agencies; ● Principles and Components of PRA; ● Principles of PRA; ● Components of PRA; ● PRA methods used in used in Watershed Management; ● Semi-structured interviewing; ● Social mapping; ● Transect walks; ● Spider web diagram; ● Participatory resource mapping; ● Photographic comparison method; ● Matrix ranking; ● Time line (Historical mapping); ● Wealth Ranking; ● Behaviour and attitude; ● Sharing; ● Organizations practicing PRA watershed development in India; ● Analysis of the impact of Participatory Watershed Management; ● Current challenges to PRA; ● Innovation; ● People's Participation Case Study within India; ● Jhabua down the Ages; ● Rescue Mission; ● Putting People first; ● Co-ordination at Various Levels; ● Integration with Joint Forest Management (JFM); ● Financial Arrangements; ● Saving Schemes; ● Economic Gains from Ecological Wealth; ● Water Availability; ● Afforestation; ● Agricultural Production; ● Food Security; ● Fodder Availability; ● 	

17.	Policy Approaches & Management Plan	145-156
	Need for Policy in Watershed Management; ● Policy Approaches for Watershed Management; ● Objectives; ● Guiding Principles; ● Supporting Strategies; ● Financing; ● Legislation; ● Proposed Institutions and Mandates; ● Natural Resources Conservation Authority (NRCA): Lead Policy and Monitoring Agency; ● Forestry Department (FD): Implementing Agency; ● Rural Agriculture Development Authority (RADA): Collaborating Agency; ● Water Resources Authority: Collaborating Agencies; ● Lands Department/Land Development and Utilization Commission (To be merged with the proposed Environment and Planning Agency): Collaborating Agencies; ● National Water Commission; ● Local Government, Youth and Community Development: Co-ordinating Agency; ● Watershed Management Plan and Global Perspective; ● Watershed Management Plan in India	
18.	Problems Facing Watershed Management	157-160
	 Development of industries; ● Interruption of Water flow; ● Development of Urban Centers; ● Poor Fishing Methods; ● Invasion by Alien Species; ● Problems in Watershed Management; ● New Prospects and Opportunities Associated with Watershed Management 	

1	Wasteland Management	162-168
	 Definitions of Wasteland Management; Forest Conservation; What is Essentially a Wasteland? Concept of Wasteland Management; Waste Land Management; Causes of Wasteland; Classification of Wastelands; How to Improve Wasteland? 	
2	Agro-Ecoregions and Land Degradation	169-172
3.	Wasteland & Degraded Classification & Types	173-180
	 Definition; ● Types of Degradation; ● Definitions; ● Type of Land Degradation Assessed; ● Other types of degradation included; ● Types of degradation excluded from the study; ● Classification & Types of Wastelands; ● Gullied land/Ravinous land; ● Undulalting upland with or without scrub; ● Surface waterlogged and marshy land; ● Shifting cultivation area; ● Degraded/under utilised notified forest land; ● Degraded pastures/grazing land; ● Types of Wastelands on Environmental Basis 	
4.	Components of Watershed Management	181-183
5.	Distribution & Extent of Wasteland in U.P.	184-222
	• L. NORTH-EASTERN REGION; • 1. Arunachal Pradesh; • 2. Assam; • 3. Manipur; • 4. Meghalaya; • 5. Mizoram; • 6. Nagaland; • 7. Sikkim; • 8. Tripura; • II. NORTHERN REGION; • 1. Delhi; • 2. Haryana; • 3. Himachal Pradesh; • 4. Jammu and Kashmir; • 5. Punjab; • 6. Uttar Pradesh; • 7. Uttarakhand; • III. EASTERN REGION; • 1. Bihar; • 2 Jharkhand; • 3. Odisha; • 4. West Bengal; • IV. CENTRAL REGION; • 1. Chhattisgarh; • 2. Madhya Pradesh; • 4. Maharashtra; • V. WESTERN REGION; • 1. Gujarat; • 2. Rajasthan; • VI. SOUTHERN REGION; • 1. Andhra Pradesh; • 2. Goa; • 5. Karnataka; • 4. Kerala; • 5. Tamil Nadu	
6.	Factors Responsible For Land Degradation	223-232
	 Land Degradation; • Impact of Land degradation; • Causes of Land Degradation; Natural degradation hazards; • Excessive Use of Fertilizers and Pesticides; • Underlying causes of degradation; • Land, population, poverty and degradation: the 	

7.	Characteristics of Different Type of Degrade & Wasteland	233-237
	 Degradation & Characteristics of Wasteland Agriculture Level; Forest Land Degradation & Wasteland Characteristics of Forest Land; Degradation & Wasteland Characteristics of Woodland Forestry; Degradations & Wasteland Characteristics of Pastures/grazing land; Degradations & Wasteland Characteristics of Wasteland Conservations 	
8.	The Problem of Land Degradation	238-253
	• 1. The effects of land degradation; • The Plight of China's loess plateau; • 2. The cost of land degradation; • 3. The breakdown of traditional solutions; • 4. The causes of land degradation; • 5. The vicious cycle of land degradation; • Problem of Land Degradation in Uttar Pradesh; • 1. Waterlogging; • 2. Salinisation; • 3. Deforestation; • 4. Soil fertility decline; • 5. Groundwater Depletion; • 7. Secondary Salinisation; • Land Degradation Problem at the Districts Level in the State	
9.	Appropriate Technique for Management of Different Types of Degraded Wasteland	254-268
	 Appropriate Technique for Management of different Types of Degraded Wasteland; ● Technological Relevance; ● Socio-economic Relevance; ● Public Sector Relevance; ● Wastelands−precursor of desertification; ● Rehabilitation of degraded lands; ● Wasteland Rehabilitation and Management Approaches; ● Acknowledgements; ● Why People's Participation?; ● Integrated Wastelands Development Project (IWDP) Scherne; ● Community Organization; ● The New Guidelines for Watershed Development; ● Main Features of Guidelines for Watershed Development; ● Alms AT; ● Recharging Wells in IWDP Projects; ● The Old and New Guidelines; ● Approach; ● Institutional Arrangements; ● State Watershed Programme Implementation and Review Committee; ● Sanctioning of Project; ● 5. Socio-Economic Impacts and Future Challenges 	
10.	Economic Consequences of Land Degradation	269-272
	 Economic valuation of natural resources and degradation; Concepts and approaches in natural resource accounting; Methods for the valuation of soil resources 	