

Contents

Preface	ix
Acknowledgments	xi

PART 1 PLANNING PRINCIPLES AND TECHNIQUES	1
Introduction to Planning Principles	1
Chapter 1 IMPORTANCE OF WATER PLANNING	3
A Water Crisis?	4
Benefits of Planning	6
References	6
Chapter 2 PLANNING, MANAGEMENT, AND PUBLIC ADMINISTRATION	8
Management, Planning, Problem Solving, and Politics	9
Management Principles	11
Some Political Aspects of Water Management	16
Role of the Planner	18
References	18
Chapter 3 PLANNING FUNDAMENTALS AND PROCESSES	19
Planning and Policy Analysis	20
The Problem-Solving Process	24
The Planning Process	27
Using Knowledge in Planning	34

Classifications of Planning	36
Effectiveness of Planning	38
Thoughts about Planning Processes	42
References	44
Chapter 4 ORGANIZING FOR WATER PLANNING	46
Organization for Water Management	46
The Concept of a Water Industry	49
The Water "Crisis" and Emerging Areas	54
Key Players in the U.S. Water Industry	57
Building Planning Organizations	63
References	77
Chapter 5 ECONOMICS AND MULTIOBJECTIVE EVALUATION	79
Multiple-Objective Analysis	80
A Multiobjective Goal-Achievement Display	83
The Economic Development Objective and Benefit-Cost Analysis	84
Measuring Benefits	88
The Time Value of Money	91
References	95
Chapter 6 FINANCIAL PLANNING IN WATER RESOURCES	96
Financing Government	98
The Budget Process	100
The Operating Budget	102
The Capital Budget	103
Capital Budgeting, Development Planning, and the Politics of Budgeting	104
Cost Allocation	106
Sources of Funds	112
Privatization	114
References	116
Chapter 7 INFORMATION, COMPUTERS, AND MODELING IN PLANNING	117
The Value of Information in Decision Making	120
Data Management and the MIS	122
Computers	127
Data Management in Water Resources	130
Modeling	132
General Model Categories	133
Presentation of Data and Information for Decision Making	139
Summary	141
References	142
Chapter 8 ENVIRONMENTAL PLANNING IN WATER RESOURCES	143
Background	144
Environmental Programs and Projects	145

The National Environmental Policy Act (NEPA)	147
An Example	150
Summary	151
References	152
PART 2 CASE STUDIES	153
Introduction to Case Studies	153
The Planning Process	154
Politics in Water Planning	156
Incrementalism	156
The Need for Action Planning	157
Importance of Finance	157
The Scientific Basis of Planning	158
Chapter 9 NATIONAL AND STATE WATER PLANNING	159
History of U.S. Water Planning	160
National Policy Formulation	162
Other Countries	165
State-Level Water Planning	167
References	170
Chapter 10 MULTIPURPOSE PROJECT PLANNING	172
General Theory of Planning Multipurpose Projects	174
Case Study: Cache la Poudre Basin, Colorado	175
References	198
Chapter 11 REGIONAL WATER SUPPLY	199
The New Jersey Program	201
Case Study: Tidewater Virginia	202
References	209
Chapter 12 WASTEWATER MANAGEMENT PLANNING	210
The Planning Environment	212
A Small Town	216
The San Francisco Wastewater Plan	219
References	228
Chapter 13 FLOOD CONTROL PLANNING	229
General Planning Considerations	229
Types of Flood Control Planning	231
A River Example	233
An Economic Evaluation Example	237
References	253

The National Environmental Policy Act (NEPA)	147
An Example	150
Summary	151
References	152
PART 2 CASE STUDIES	153
Introduction to Case Studies	153
The Planning Process	154
Politics in Water Planning	156
Incrementalism	156
The Need for Action Planning	157
Importance of Finance	157
The Scientific Basis of Planning	158
Chapter 9 NATIONAL AND STATE WATER PLANNING	159
History of U.S. Water Planning	160
National Policy Formulation	162
Other Countries	165
State-Level Water Planning	167
References	170
Chapter 10 MULTIPURPOSE PROJECT PLANNING	172
General Theory of Planning Multipurpose Projects	174
Case Study: Cache la Poudre Basin, Colorado	175
References	198
Chapter 11 REGIONAL WATER SUPPLY	199
The New Jersey Program	201
Case Study: Tidewater Virginia	202
References	209
Chapter 12 WASTEWATER MANAGEMENT PLANNING	210
The Planning Environment	212
A Small Town	216
The San Francisco Wastewater Plan	219
References	228
Chapter 13 FLOOD CONTROL PLANNING	229
General Planning Considerations	229
Types of Flood Control Planning	231
A River Example	233
An Economic Evaluation Example	237
References	253

Chapter 14	STORM-WATER MANAGEMENT PLANNING	255
	A Success in Drainage Planning	260
	Storm-Water Investment Policies	266
	Role of Government	270
	Role of the Professional Community	270
	Role of Business and Industry	270
	References	271
Chapter 15	WATER QUALITY PLANNING FOR AN ESTUARY	272
	The Planning Program	274
	Conclusion	278
	References	278
Chapter 16	GROUNDWATER PLANNING	279
	Resource Assessment	280
	Management Planning	281
	Groundwater Protection	281
	Scientific Tools Available	281
	Planning Scenarios	282
	Case: The Ogallala Aquifer	284
	Case: A National Groundwater "Strategy"	296
	References	300
Chapter 17	RIVER BASIN PLANNING	301
	Background	301
	Types of River Basin Planning	304
	Integration of Water Management	305
	Upper Neuse Basin, North Carolina	307
	The Yadkin-Pee Dee Study	309
	Potomac River Water Supply	313
	South Platte River Basin, Colorado	316
	Conclusion	318
	References	318
Index	321	