International Environmental Law and Policy Series

## The Scarcity of Water

### **Emerging Legal and Policy Responses**

Editors

Edward H.P. Brans, Esther J. de Haan, André Nollkaemper and Jan Rinzema



### **Table of Contents**

		orial Preface of Abbreviations	xiii xv
	PA	RT I: STATE OF THE PROBLEM	
	Ch	pter 1 The Global Water Crisis: The Major Issue of the Twenty – first Century, A Growing and Explosive	
	H.L	<b>Problem</b> F. Saeijs and M.J. van Berkel	3
	1.	Introduction	3
	2.	The state of fresh water worldwide	5
		2.1 Alarming voices from the international community	5 5 5
		2.2 The problems defined	5
	3.	Escalation of the problems	11
		3.1 Ten billion people in the world in the year 2100	11
		3.2 Fresh water supply becoming increasingly expensive	12
	à.	3.3 Eco-refugees	13
	Ì	3.4 Thirsty cities and economic development	13
		3.5 Hungry people and thirsty agriculture	14
·	<b>4</b> .	Strategy for sustainable river basins in the twenty-first century	15
11	5.	Deterioration of the Rhine river basin	15
	6.	The state of fresh water in the Netherlands	17
	_	6.1 The Netherlands' dependency on other countries for fresh water	17
	7.	Conclusions	19
		pter 2 Water Scarcity – Challenges for the Future	21
	М.	Falkenmark	
	1.	Introduction	21
	2.	What is the problem?	23
		2.1 Societal drivers and responses	23
		2.2 Water-related life support constraints	24
4		2.3 Water's multiple functions in nature and society	26
}	3.	Where is the world heading?	27
		3.1 The impending water crisis	27
		3.2 Global increase in dispute proneness	28

	3.3	Where water is scarce human activities get complicated	30
	34	Typical water scarcity profiles	31
	3.5	Dependence on imported water	33
 <u>}4.</u>	Con	flicts of interest	34
7		Categories of water-related disputes	34
	4.2	Problems of sharing the rain over the river basin	37
5.		are challenges and solutions	38
		New eco-conflicts	38
	5.2	Need for a paradigmatic shift in the approach to water	39
		Who owns the rain?	39

#### PART II: INTERNATIONAL WATER LAW

	apter 3 Water Scarcity: Institutional and Legal Responses phan McCaffrey	43
1.	Introduction	43
	Water scarcity: the nature of the problem	44
	2.1 The world's water supply	44
¥-	2.2 Population	45
	2.3 Access to water and sanitation	45
	2.4 Urbanization	46
	2.5 Water stress and scarcity	47
	2.6 Human use of water	47
	2.7 Water quality	48
	2.8 The international dimension	48
13	Strategies to alleviate water scarcity	49
- vas.	3.1 Water scarcity and the United Nations	49
	3.2 The role of law	52
4.	Outlook	56
ч.	Outrook	50
C	hapter 4 Legal Procedures Applicable to Interstate	
,	Conflicts on Water Scarcity: The Gabcikovo Case	59
Al	exandre Kiss	
1.	Introduction	59
2.	The concepts of water scarcity and interstate conflicts	60
	2.1 The relative nature of water scarcity	60
	2.2 The concept of interstate conflicts	61
3.		62
	3.1 The obligation to cooperate	64
	3.2 Assessment of transboundary effects	64
	3.3 Informing potentially affected states	65
	3.4 Public participation	65
	3.5 The establishment of international commissions	66

3300**0**0

Table of Contents	vii
<ul><li>4. A case study: the Gabcikovo case</li><li>5. Conclusion</li><li>Annex</li></ul>	67 72 76
Chapter 5 The Protection of International Watercourses as Sources of Fresh Water in the Interest of Future Generations	80
Marjon Kroes	
<ol> <li>Introduction</li> <li>The ILC draft Articles on the law of the non-navigational uses of international watercourses</li> </ol>	80 81
3. The principle of equitable and reasonable utilization	83
k-4. The general principle not to cause significant transboundary harm	87
<ul> <li>A. The general principle not to cause significant transportation values of the provisions on environmental protection</li> <li>Concluding remarks</li> </ul>	90
6. Concluding remarks	98
Chapter 6 Securing Access to Safe Drinking Water through Trade and International Migration	100
P.J.I.M. de Waart	100
1. Water: "a constant quantity" of nature	100
1.1 A decent social and international order 1.2 Joint responsibility	101
1.2 Joint responsibility	102
$\geq 2$ . Water as a UN concern	103
2.1 Access to fresh water	104
2.2 Absolute poverty	105
2.3 Quality of life	106
- 3. Bringing water to the people: trade	106
3.1 Human rights in international trade	107
	108
4. Bringing people to the water: migration	109
4.1 Olobal human security	110
4.2 The role of the labour market	111
-75. (Inter)national law in the market place	114
5.1 Happiness and perfection of states	114
5.2 (Inter)national good governance	116
PART III: WATER SCARCITY IN SELECTED RIVER BASINS	
<b>Chapter 7</b> The Nile as a Legal and Political Structure Joseph W. Dellapenna	121
1. Introduction	121

••	miloduction	
2.	The emergence of the Nile River Treaty system	122

	<ol> <li>The unravelling of the Nile Treaty system</li> <li>Crafting a new treaty regime</li> <li>Conclusion</li> </ol>	126 129 133
	Chapter 8 Fresh Water as a Source of International Conflicts: The Water Conflicts between Israel, Jordan and the Palestinians Henk Donkers	135
and the second	1. Introduction: International conflicts over water	136
,	2. The geo-hydrological context of the Israeli-Arab water conflict	138
P	3. Roots of the conflict and escalation	141
	3.1 The roots of the Israeli-Arab water conflict	141
	3.2 Escalation to the Six-day or June War of 1967	143
	4. Israeli water politics with respect to the West Bank	145
si farmer .	5. The water crisis and its solutions	147
,	5.1 Solutions	147
a constraints	6. Peace negotiations and treaties	154
	7. Conclusions	157
	Chapter 9 Middle East Water Problems: The Jordan River Stephen McCaffrey	158
	1. Introduction	158
	2. The Jordan	159
	2.1 The problem	159
	2.2 Possible solutions	159
	3. Is international water law of any help?	160
	3.1 Sources: custom and treaties	160
	3.2 Evaluation of the Peace Treaty's provisions on water	162
	4. Final observations	165
	Chapter 10 International Law and Water Scarcity in Africa Prof. Dr. C.O. Okidi	166
	1. Introduction	166
	2. Water distribution in Africa	167
	3. The practice in international water law in Africa	170
	3.1 The Nile Waters Agreement 1959	171
	3.2 1972 OMVS Treaty	172
	3.3 1977 KBO Treaty	173
	3.4 1980 Convention Creating Niger Basin Authority	174
	3.5 1987 Agreement on the Common Zambezi River System	175
	3.6 River basins within broad concerns	175
	4. Features of international law as practiced in Africa	177
	5. Some supporting measures	178
	5.1 Capacity building	179
	5.2 Financial support	179
	5.3 Governance	180

#### PART IV: WATER SCARCITY IN SELECTED REGIONS

Chapter 11 Current Trends in United States Water Law and Policy: Private Property Rights, Public Interest Limitations and the Creation of Markets	183
A. Dan Tarlock	105
1. Introduction	183
2. The common law of riparian rights	185
3. The law of prior appropriation	187
4. The special case of Indian tribes	189
5. Future allocation issues	190
$\sim$ $25.1$ Water markets	190
<ul><li>5.2 Third parties and the protection of community values</li><li>6. Conclusion</li></ul>	193 195
Chapter 12 Liability in Tort for the Detrimental Use of	
Fresh Water Resources under Dutch Law in	
Domestic and International Cases	196
Jan M. van Dunné	
1. Introduction	196
2. Tort liability for detrimental use of fresh water sources under	
Dutch law in groundwater drainage cases	198
3. Case law on water pollution, based on neighbour law, water	
servitude and nuisance	202
4. The comparison of civil law (tort) and public international law	
with respect to the principles governing wrongful acts causing cross-border pollution	207
5. Conclusions	207
5. Concidentia	211
Chapter 13 Liability for Damage to River Beds in	
The Netherlands	212
Gerrit Betlem	
1. Introduction	212
2. The law and policy of clean-up of polluted river beds	213
<ol> <li>Comparison with liability for contaminated land</li> <li>Infringement of property rights</li> </ol>	215 215
3.2 Contributory negligence	213
4. Recovery of clean-up costs of polluted river beds	219
4.1 Historic pollution: liability under article 75(5) SPA	219
4.2 Tort liability	220
4.3 Strict liability for dangerous substances and waste	
disposal sites	220
7. 4.4 The statutory duty of care of the Environmental	222
Protection Act	222 223
5. Conclusion: cost recovery actions not often feasible	223

Ch	apter	14 Disputing Water Rights: Scarcity of Water in Nepal Hill Irrigation	224
<i>K</i> . •	von B	enda-Beckmann, H.L.J. Spiertz and F. von Benda-Beckmann	
1.	Intro	duction	224
2.	Hist	orical background	227
3.	Lega	al principles of access, distribution, allocation, operation and	
		agement	230
	3.1	Rights of access	231
	3.2	Distribution	232
	3.3	Maintenance	233
	3.4	Principles, rights and negotiations	233
4.	Con	testing rights – precarious negotiated orders	234
	4.1	Case 1: The negotiated order of Jivanpur and Badgaon	
		irrigation	234
	4.2	Case 2: From water theft to water right in the Telia Kulo	
		irrigation system	237
5.	Con	clusions	240
PA	ART V	: WATER SCARCITY AND ECONOMIC LAW	

# Chapter 15 Balancing Free Trade in Water and the Protection

<b>Chapter 15</b> Balancing Free Trade in Water and the Protection,	6 1.41
of Water Resources in GATT gougal for the Well's Esther J. de Haan	245
Esther J. de Haan	

		245
		246
		246
	2.2 Economic valuation of water	247
	2.3 Technical developments in transporting water	247
		248
	3. Transferring water between British Colombia and the USA	249
-	1 Balancing free water trade and the protection of water resources	
,	in GATT	251
$\sim 1$	<ul> <li>in GATT</li> <li>5. Restricting water exports for conservation purposes</li> <li>5.1 The use of export tariffs for water conservation purposes</li> </ul>	253
	5.1 The use of export tariffs for water conservation purposes	253
	5.2 The use of quantitative export restrictions for water	
	conservation purposes	254
		257
	6. Conclusions	258
	Chapter 16 Water Conflicts Between Mexico and the	
	United States: Towards a Transboundary Regional	
		260
	Roberto A. Sánchez	
	1. Introduction	260
		262
	state of the connect	202

Table	of	Contents
-------	----	----------

xi

	2.1 The Colorado River	262
	2.2 The Rio Grande/Río Bravo	264
	2.3 Shared groundwater resources	266
3.	The institutional framework	268
	3.1 Overview	268
	3.2 NAFTA	269
4.	A transboundary water market?	270
	4.1 Formal and informal water markets	271
	4.2 The informal water market and its potential consequences	272
5.	Global warming	274
6.	Conclusions	275
	apter 17 Privatization of Drinking Water in Europe	277
Lei	gh Hancher	
1.	Introduction	277
. 2.	An internal water market?	278
	Liberalization and privatization	279
	3.1 The utility sectors: telecommunication, postal services and gas	
	and electricity	279
	-3.2 The European water sector	281
	>3.3 The relevance of Community law	283
	3.4 Conclusion	285
4.	The United Kingdom experiment	286
- 5.	Privatization, foreign investment and national interests	288
6.	Conclusion	289
Ind	ex	291