Contents

Lis	t of Maps	viii
Pre	Preface	
1	Introduction	1
2	How Much Water is Used for Producing	145
	our Goods and Services?	7
	Virtual Water	8
	How to Estimate the Virtual-Water Content of	
	an Agricultural Product	10
	Water Use for Crop and Livestock Products	12
	Water Use for Industrial Products	15
	Water for Domestic Services	16
3	Virtual-Water Flows Between Nations as a Result	
	of Trade in Agricultural and Industrial Products	19
	Virtual-Water "Trade" or "Transfer"?	20
	How to Assess International Virtual-Water Flows	20
	International Virtual-Water Flows	22
	Virtual-Water Flows Between World Regions	25
	Are Consumers Co-Responsible for the Effects	
	of Water Use?	27
	The Relation Between Trade and Water Scarcity	28
4	Water Saving Through International Trade in	
	Agricultural Products	31
	Method	34
	National Water Savings	36
	National Water Losses	39
	Global Water Savings	42

	Global Blue Water Savings at the Cost of Green	
	Water Losses	47
	Physical versus Economic Savings	48
	The Downside of Virtual-Water Import	
	as a Solution to Water Scarcity	49
5	The Water Footprints of Nations	51
	Two Methods of Assessing the Water Footprint	
	of a Nation	53
	Internal and External Water Footprint	54
	Water Footprints of Nations	55
	Determining Factors	61
	How can Water Footprints be Reduced?	63
	The Water Footprint as a New Indicator of	
	Water Use	64
6	The Water Footprints of Morocco and the Netherlands	67
	Virtual-Water Flows and Balances	68
	Agricultural Water Footprints of Morocco and	
	the Netherlands	70
	Water Savings	71
	Trade in the Context of Managing Water	73
7	Virtual- versus Real-Water Transfers Within China	75
	Assessing Virtual-Water Flows Between Regions in China	76
	Virtual-Water Content per Product Category per Region	77
	Food Trade Within China	78
	Virtual-Water Transfers Within China	79
	Virtual- versus Real-Water Budgets	80
	Virtual-Water Transfers in Relation to Water Availability	82
	North-South Virtual-Water Flows in Relation to	
	the South-North Water Transfer Project	82
8	The Water Footprint of Coffee and Tea Consumption	85
	Virtual-Water Content of Coffee and Tea in	
	Different Production Stages	87
	Virtual-Water Flows Related to the Trade	
	in Coffee and Tea	93
	The Water Needed to Drink a Cup of Coffee or Tea	98
	The Water Footprint of Coffee and Tea Consumption	98
9	The Water Footprint of Cotton Consumption	103
	Green, Blue, and Gray Water	105
	The Virtual-Water Content of Seed Cotton	107

	The Virtual-Water Content of Cotton Products	112
	Impact on Water Quality in the Crop Production Stage	113
	Impact on Water Quality in the Processing Stage	114
	International Virtual-Water Flows	119
	Water Footprints Related to Consumption	
	of Cotton Products	121
	Sustainable Use of Water	127
10	Water as a Geopolitical Resource	131
11	Efficient, Sustainable, and Equitable Water Use in	
	a Globalized World	137
	Fairness and Sustainability of Large Water Footprints	139
	Global Rules of the Game	140
	An International Protocol on Water Pricing	141
	A Water Label for Water-Intensive Products	142
	Minimum Water Rights	142
	(Tradable) Water-Footprint Permits	144
	Global Arrangements versus the Subsidiarity Principle	145
	Globalization: Pro or Anti?	146
App	pendices and the same and the s	147
I	Analytical Framework for the Assessment of	
	Virtual-Water Content, Virtual-Water Flows, Water	
	Savings, Water Footprints, and Water Dependencies	147
II	Virtual-Water Flows per Country Related to International	
	Trade in Crop, Livestock, and Industrial Products	157
III	National Water Savings and Losses Due to Trade	
	in Agricultural Products	169
IV	Water Footprints of Nations	177
V	Water Footprint versus Water Scarcity, Self-Sufficiency,	
	and Water Import Dependency per Country	183
CI		191
Glo	Glossary	
References		195
Ind	Index and to always and to an agreed sales ladely adil. II	