

## PART I - Fundamentals and process understanding

<b>1</b>	<b>Introduction</b> _____	<b>4</b>
	<i>P. Speth and A. H. Fink</i>	
<b>2</b>	<b>Impacts of Global Change</b> _____	<b>12</b>
	<i>A. H. Fink and M. Christoph</i>	
	<b>2.1 Impacts of Global Change south of the Sahara</b> _____	<b>16</b>
	<i>A. H. Fink, M. Christoph, V. Ermert, A. Kuhn, T. Heckelei, and B. Diekkrüger</i>	
	<b>2.2 Impacts of Global Change north of the Sahara</b> _____	<b>24</b>
	<i>A. H. Fink, M. Christoph, B. Diekkrüger, B. Reichert, A. Kuhn, and T. Heckelei</i>	
<b>3</b>	<b>Regional geography of West and Northwest Africa:</b>	
	<b>An introduction</b> _____	<b>30</b>
	<i>G. Menz</i>	
	<b>3.1 Geology</b> _____	<b>35</b>
	<i>B. Reichert, S. Klose, and A. Kocher</i>	
	<b>3.2 Topography and natural regions</b> _____	<b>40</b>
	<i>G. Menz</i>	
	<b>3.3 Soils</b> _____	<b>46</b>
	<i>T. Gaiser, H. Goldbach, S. Giertz, C. Hiepe, and A. Klose</i>	
	<b>3.4 Climate</b> _____	<b>54</b>
	<i>A. H. Fink, M. Christoph, K. Born, T. Brücher, K. Piecha, S. Pohle, O. Schulz, and V. Ermert</i>	
	<b>3.5 Hydrology</b> _____	<b>60</b>
	<i>B. Diekkrüger, H. Busche, S. Giertz, and G. Steup</i>	
	<b>3.6 Flora and vegetation</b> _____	<b>66</b>
	<i>S. Porembski, M. Finckh, and B. Orthmann</i>	
	<b>3.7 Political and administrative structures:</b>	
	<b>History and present situation</b> _____	<b>70</b>
	<i>G. Menz</i>	

---

<b>3.8 Population, ethnicity, and religion</b>	<b>74</b>
<i>M. Heldmann, M. Bollig, K. Hadjer, H. Kirscht, V. Mulindabigwi, and M. Rössler</i>	
<b>3.9 Economy and infrastructure</b>	<b>82</b>
<i>A. Kuhn, I. Gruber, and C. Heidecke</i>	
<b>3.10 Agriculture and food</b>	<b>88</b>
<i>M. Janssens, Z. Deng, V. Mulindabigwi, and J. Röhrig</i>	
<b>3.11 Health and water</b>	<b>94</b>
<i>J. Verheyen, R. Baginski, and H. Pfister</i>	
<b>3.12 References for chapter I-3</b>	<b>98</b>
<b>4 Measurement concepts</b>	<b>104</b>
<i>A. H. Fink</i>	
<b>4.1 Hydro-meteorological measurements in Benin</b>	<b>108</b>
<i>S. Pohle, A. H. Fink, S. Giertz, and B. Diekkrüger</i>	
<b>4.2 Weather and climate monitoring in Benin</b>	<b>114</b>
<i>M. Diederich and C. Simmer</i>	
<b>4.3 Hydro-meteorological measurements in the Drâa catchment</b>	<b>122</b>
<i>O. Schulz, M. Finckh, and H. Goldbach</i>	
<b>5 Atmosphere</b>	<b>132</b>
<i>A. H. Fink</i>	
<b>5.1 Meteorological processes influencing the weather and climate of Benin</b>	<b>135</b>
<i>A. H. Fink, H. Paeth, V. Ermert, S. Pohle, and M. Diederich</i>	
<b>5.2 Meteorological processes influencing the weather and climate of Morocco</b>	<b>150</b>
<i>K. Born, A. H. Fink, and P. Knippertz</i>	

<b>6</b>	<b>Continental hydrosphere</b> _____	<b>164</b>
	<i>B. Diekkrüger</i>	
	<b>6.1 Hydrological processes and soil degradation in Benin</b> _____	<b>168</b>
	<i>S. Giertz, C. Hiepe, G. Steup, L. Sintondji, and B. Diekkrüger</i>	
	<b>6.2 Hydrological processes and soil degradation in Southern Morocco</b> _____	<b>198</b>
	<i>A. Klose, H. Busche, S. Klose, O. Schulz, B. Diekkrüger, B. Reichert, and M. Winiger</i>	
<b>7</b>	<b>Biosphere</b> _____	<b>254</b>
	<i>J. Röhrig and H. Goldbach</i>	
	<b>7.1 Vegetation cover and land use change in Benin</b> _____	<b>257</b>
	<i>M. Judex, J. Röhrig, C. Linsoussi, H.-P. Thamm, and G. Menz</i>	
	<b>7.2 Vegetation dynamics under climate stress and land use pressure in the Drâa catchment</b> _____	<b>274</b>
	<i>M. Finckh and H. Goldbach</i>	
<b>8</b>	<b>Anthroposphere</b> _____	<b>282</b>
	<i>A. Kuhn and T. Heckelei</i>	
	<b>8.1 The societal framework of water management and strategies of livelihood security</b> _____	<b>285</b>
	<i>M. Bollig and M. Rössler</i>	
	<b>8.1.1 Social organization, livelihoods, and politics of water management in Benin</b> _____	<b>286</b>
	<i>K. Hadjer, B. Höllermann, and M. Bollig</i>	
	<b>8.1.2 Demographic development in Southern Morocco: Migration, urbanization, and the role of institutions in resource management</b> _____	<b>305</b>
	<i>M. Rössler, H. Kirscht, C. Rademacher, and S. Platt</i>	
	<b>8.2 Economics of agriculture and water use</b> _____	<b>315</b>
	<i>A. Kuhn</i>	
	<b>8.2.1 Climate and socio-economic impacts on Benin's agriculture</b> _____	<b>316</b>
	<i>A. Kuhn and I. Gruber</i>	

	<b>8.2.2 Hydro-economic processes and institutions in Southern Morocco</b>	<b>329</b>
	<i>C. Heidecke, A. Kuhn, and C. Liebelt</i>	
<b>9</b>	<b>Summary</b>	<b>342</b>
	<i>P. Speth and A. H. Fink</i>	

## PART II - Future projections and decision support

<b>1</b>	<b>Introduction: The IMPETUS method</b>	<b>352</b>
	<i>P. Speth and B. Diekkrüger</i>	
<b>2</b>	<b>The IMPETUS Spatial Decision Support Systems</b>	<b>360</b>
	<i>A. Enders, B. Diekkrüger, R. Laudien, T. Gaiser, and G. Bareth</i>	
<b>3</b>	<b>Scenarios</b>	<b>394</b>
	<i>M. Christoph, B. Reichert, and A. Jaeger</i>	
	<b>3.1 Methodology of the IMPETUS-scenarios</b>	<b>397</b>
	<i>M. Christoph, B. Reichert, and A. Jaeger</i>	
	<b>3.2 Climate scenarios</b>	<b>402</b>
	<i>M. Christoph, A. H. Fink, H. Paeth, K. Born, M. Kerschgens, and K. Piecha</i>	
	<b>3.3 Socio-economic scenarios</b>	<b>426</b>
	<i>B. Reichert and A. Jaeger</i>	
	<b>3.4 Population projections for Benin</b>	<b>442</b>
	<i>M. Doevenspeck and M. Heldmann</i>	
<b>4</b>	<b>Impacts of Global Change in Benin</b>	<b>450</b>
	<i>A. H. Fink</i>	
	<b>4.1 Impacts of Global Change on food security in Benin</b>	<b>454</b>
	<i>A. Kuhn, V. Mulindabigwi, M. Janssens, G. Steup, T. Gaiser, H. Goldbach, I. Gruber, and E. Gandonou</i>	

<b>4.2 Impacts of Global Change on water resources and soil degradation in Benin</b>	<b>484</b>
<i>S. Giertz, C. Hiepe, B. Höllermann, and B. Diekkrüger</i>	
<b>4.3 Land use and land cover modelling in Central Benin</b>	<b>512</b>
<i>G. Menz, M. Judex, V. Orékan, A. Kuhn, M. Heldmann, and H.-P. Thamm</i>	
<b>4.4 Migration, property rights, and local water resources management in Benin</b>	<b>536</b>
<i>K. Hadjer, M. Heldmann, V. Mulindabigwi, M. Bollig, and M. Doevenspeck</i>	
<b>4.5 Vector-borne and water-borne diseases in Benin</b>	<b>550</b>
<i>A. Uesbeck, V. Ermert, R. Baginski, M. Krönke, H. Pfister, and J. Verheyen</i>	
<b>5 Impacts of Global Change in Southern Morocco</b>	<b>562</b>
<i>B. Reichert</i>	
<b>5.1 Importance of resource management for livelihood security under Climate Change in Southern Morocco</b>	<b>566</b>
<i>A. Kuhn, C. Heidecke, A. Roth, H. Goldbach, J. Burkhardt, A. Linstädter, B. Kemmerling, and T. Gaiser</i>	
<b>5.2 Impacts of Global Change on water resources and soil salinity in Southern Morocco</b>	<b>592</b>
<i>S. Klose, H. Busche, A. Klose, O. Schulz, B. Diekkrüger, B. Reichert, and M. Winiger</i>	
<b>5.3 Land use and land cover in Southern Morocco: Managing unpredictable resources and extreme events</b>	<b>612</b>
<i>A. Linstädter, G. Baumann, K. Born, B. Diekkrüger, P. Fritzsche, H. Kirscht, and A. Klose</i>	
<b>5.4 Migration and resource management in the Drâa Valley, Southern Morocco</b>	<b>634</b>
<i>M. Rössler, H. Kirscht, C. Rademacher, S. Platt, B. Kemmerling, and A. Linstädter</i>	
<b>6 Summary and conclusions</b>	<b>648</b>
<i>P. Speth, A. H. Fink, and B. Diekkrüger</i>	

---

<b>Authors</b>	<b>656</b>
<b>Acronyms</b>	<b>661</b>
<b>Index</b>	<b>668</b>



<http://www.springer.com/978-3-642-12956-8>

Impacts of Global Change on the Hydrological Cycle in  
West and Northwest Africa

Speth, P.; Christoph, M.; Diekkrüger, B. (Eds.)

2010, XVI, 675 p., Hardcover

ISBN: 978-3-642-12956-8