Contents

Foreword ......................................................... xi
Michel GRIFFON

Introduction .................................................. xiii
Ludovic TEMPLE and Eveline M.F.W. COMPAORÉ SAWADOGO

Chapter 1. Innovation Platforms as a Tool to Support Technological Change in the Agri-Food Sector in Developing Countries: A Case Study of the Plantain Value Chain in Côte d’Ivoire ........ 1
Euphrasie C.M. ANGBO-KOUAKOU, Ludovic TEMPLE, Syndhia MATHÉ and Alexandre ASSEMIEN

1.1. Introduction .............................................. 1
1.2. Technological innovations in the Ivorian plantain sector ........ 4
   1.2.1. Development of plantain cultivar transfers .......... 4
   1.2.2. History of the WAAPP plantain program ........ 5
   1.2.3. Innovation platform features: objectives, composition and governance ........ 6
1.3. Conceptual and methodological framework .................. 10
   1.3.1. SIS: framework for analyzing technological changes based on the strategies of stakeholders in agri-food chains .... 10
   1.3.2. Conceptualization of the four components of an AIS ........ 11
   1.3.3. Methodological and analytical framework .......... 13
1.4. Results .................................................. 17
   1.4.1. Functionality of Côte d’Ivoire’s PIPs .............. 17
   1.4.2. Reorganization of the AIS components by PIPs ........ 17
   1.4.3. Redirecting technological trajectories in the plantain sector in Côte d’Ivoire ....................... 18
1.5. Discussion of the functionalities of the system and IAs ........ 20
1.5.1. Functionalities of the agricultural SIS for the plantain sector in Côte d’Ivoire ............................................. 20
1.5.2. IAs and changes ................................................. 21
1.5.3. Renewal of technological innovation processes .......... 21
1.6. Conclusion ................................................................ 22
1.7. Bibliography ......................................................... 23

Chapter 2. Biotechnological Cotton in Burkina Faso: An Innovation Trajectory in a Development Context ................. 29
Eveline M.F.W. COMPAORE SAWADOGO

2.1. Introduction .......................................................... 29
2.2. The rise of biotechnological cotton within a context of persistent development problems ............................... 33
2.3. Institutional mechanisms that led to the adoption of biotechnological cotton innovation in Burkina Faso .......... 34
2.4. Identification of the actors and their place in the Bt innovation trajectory ....................................................... 35
   2.4.1. Cotton producers ............................................. 35
   2.4.2. Cotton industries ............................................. 36
   2.4.3. Cotton researchers .......................................... 36
   2.4.4. Civil society ................................................... 37
   2.4.5. The government of Burkina Faso ......................... 37
2.5. Stabilization of the Bt cotton adoption process ............... 42
2.6. Discussion and conclusion on the failure of Bt cotton in Burkina Faso ............................................................... 43
2.7. Bibliography ......................................................... 45

Chapter 3. Emergence of a Biofuel Innovation System and Production in Burkina Faso: An Analysis of the Determinants and Challenges for its Development ........................................ 51
Salif DERRA and Ludovic TEMPLE

3.1. Introduction .......................................................... 51
3.2. Methodology ......................................................... 52
   3.2.1. Analytical framework ...................................... 52
   3.2.2. Data collection ................................................ 55
3.3. Defining the biofuel innovation and production system. .................................................................................. 56
3.4. Incentives for the emergence of the actor system .......... 58
   3.4.1. Biofuel support policies .................................... 58
   3.4.2. Increased funding for biofuels research ................ 59
   3.4.3. Financing of biofuel production projects ............... 60
3.5. Functional analysis of the biofuel innovation and production system ............................................................. 60
   3.5.1. Creation of a platform for capacity-building ........... 60
3.5.2. Functioning of the biofuels sector in Burkina Faso ............. 61
3.5.3. Biofuel development models .................................. 62
3.6. The failures of the biofuel innovation and production system .... 63
  3.6.1. Insufficient knowledge on the consequences of technical choices ........................................ 63
  3.6.2. Poor interaction within the actor network ................... 64
  3.6.3. Lack of regulatory frameworks and standards ............... 64
  3.6.4. Apprehension from national and international civil society .. 65
3.7. Conclusion .................................................. 65
3.8. Bibliography ................................................ 66

Chapter 4. Trajectories of Innovation in Conservation Agriculture at Lake Alaotra in Madagascar ......................... 71
Eric PENOT, Valentin FEVRE and Patricia FLODROPS

4.1. Introduction .............................................. 71
4.2. The problem ............................................ 73
4.3. Methodology ........................................... 75
4.4. Status report on the adoption of CA in 2013 .................... 76
4.5. Developments in farming practices and innovations in CA ...... 79
4.6. A wide variety of growing systems among the early adopters ... 80
4.7. Learning, innovation co-design and IS ........................ 82
  4.7.1. Learning and recombination of knowledge .................. 82
  4.7.2. Empirical example of an evolution towards co-construction of systems ................................ 82
  4.7.3. Toward innovation comanagement ........................ 83
4.8. Contrasting behaviors after project shutdown .................... 84
4.9. Conclusion .............................................. 87
4.10. Bibliography ........................................... 91

Chapter 5. Ecological Transition of an Innovation Model: Yam Seed Production in Haiti .......................... 95
James BOYER and Ludovic TEMPLE

5.1. Introduction ............................................. 95
5.2. Conceptual and methodological frameworks ..................... 97
  5.2.1. Yam production in Haiti ................................ 97
  5.2.2. Methodology and data collection ........................ 97
  5.2.3. A three-phase mechanism for collecting data and validating results .................................. 98
5.3. The diffusionist attempt to transfer Miniset technology in Haiti .... 100
  5.3.1. Emergence of the Miniset technique in Haiti .......... 100
  5.3.2. Orientation based on external research and exogenous elements .................................. 100
  5.3.3. The diffusionist model’s failed attempt at adapting .... 102
<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.3.4</td>
<td>Co-constructing adoption: adapting the technology to green the process</td>
<td>104</td>
</tr>
<tr>
<td>5.4</td>
<td>From adoption results to the socioeconomic impacts of Miniset</td>
<td>107</td>
</tr>
<tr>
<td>5.4.1</td>
<td>Evolution of the adoption rate</td>
<td>107</td>
</tr>
<tr>
<td>5.4.2</td>
<td>Impact on production</td>
<td>107</td>
</tr>
<tr>
<td>5.5</td>
<td>Discussion of the conditions for changing an innovation model</td>
<td>109</td>
</tr>
<tr>
<td>5.5.1</td>
<td>Miniset: the failure of linear and diffusionist innovation models</td>
<td>109</td>
</tr>
<tr>
<td>5.5.2</td>
<td>Miniset: a positive contribution to agro-ecological innovation</td>
<td>110</td>
</tr>
<tr>
<td>5.5.3</td>
<td>Miniset: a reaffirmation of the importance of action research</td>
<td>111</td>
</tr>
<tr>
<td>5.6</td>
<td>Conclusion</td>
<td>111</td>
</tr>
<tr>
<td>5.7</td>
<td>Appendix: characteristics of surveyed areas</td>
<td>113</td>
</tr>
<tr>
<td>5.8</td>
<td>Bibliography</td>
<td>115</td>
</tr>
</tbody>
</table>

### Chapter 6. Diversity of Innovation Processes in the Niayes Market Gardening System (Senegal): Between Conventional Intensification and Agro-Ecological Transition

Patrick DUGUÉ, Isabelle MICHEL, Victor KETTELA and Serge SIMON

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.1</td>
<td>Introduction</td>
<td>117</td>
</tr>
<tr>
<td>6.2</td>
<td>Theoretical position</td>
<td>119</td>
</tr>
<tr>
<td>6.3</td>
<td>Methodology</td>
<td>120</td>
</tr>
<tr>
<td>6.3.1</td>
<td>Context</td>
<td>120</td>
</tr>
<tr>
<td>6.3.2</td>
<td>Combination of methods</td>
<td>122</td>
</tr>
<tr>
<td>6.4</td>
<td>Results: diversity of technical innovation processes</td>
<td>124</td>
</tr>
<tr>
<td>6.4.1</td>
<td>Adoption and adaptation of an innovation from large capital-intensive farms: drip irrigation and electric pumping</td>
<td>124</td>
</tr>
<tr>
<td>6.4.2</td>
<td>An innovation process led by a development operator: the use of biopesticides and organic manure</td>
<td>125</td>
</tr>
<tr>
<td>6.4.3</td>
<td>Poorly visible innovations carried forward by market gardeners</td>
<td>128</td>
</tr>
<tr>
<td>6.5</td>
<td>Discussion</td>
<td>131</td>
</tr>
<tr>
<td>6.5.1</td>
<td>Recognizing the innovation capacities of farmers</td>
<td>131</td>
</tr>
<tr>
<td>6.5.2</td>
<td>Why should agronomists be interested in farming innovation?</td>
<td>132</td>
</tr>
<tr>
<td>6.5.3</td>
<td>How to support innovation processes?</td>
<td>135</td>
</tr>
<tr>
<td>6.6</td>
<td>Conclusion</td>
<td>136</td>
</tr>
<tr>
<td>6.7</td>
<td>Bibliography</td>
<td>137</td>
</tr>
</tbody>
</table>

### Chapter 7. Food Challenges in Africa

Jean-Marc BOUSSARD

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.1</td>
<td>Food challenge in Africa</td>
<td>141</td>
</tr>
<tr>
<td>7.2</td>
<td>How to improve the food production capacity of sub-Saharan Africa</td>
<td>143</td>
</tr>
<tr>
<td>7.3</td>
<td>Difficulty in raising capital</td>
<td>145</td>
</tr>
<tr>
<td>7.4</td>
<td>Agricultural prices south of the Sahara</td>
<td>149</td>
</tr>
</tbody>
</table>