

Unleashing India's Innovation

Toward Sustainable and Inclusive Growth

Mark A. Dutz, Editor



Contents

Foreword	ix		
Acknowled	lgme	nts	xi
Abbreviati	ons	xiii	
Executive S	Sum	mary	/ xı

Overview: Toward an Action Agenda for Innovation 1
Mark A. Dutz

- 1 The Indian Context and Enabling Environment 23

 Mark A. Dutz and Carl Dahlman
- 2 Creating and Commercializing Knowledge 49 Carl Dahlman, Mark A. Dutz, and Vinod K. Goel
- 3 Diffusing and Absorbing Knowledge 83
 Vinod K. Goel, Carl Dahlman, and Mark A. Dutz
- 4 Promoting Inclusive Innovation 105

 Anuja Utz and Carl Dahlman
- 5 Strengthening Skills and Education for Innovation 129

 Isak Froumin, Shanthi Divakaran, Hong Tan, and Yevgeniya Savchenko
- 6 Upgrading Information Infrastructure 147
 Shanthi Divakaran, Anil Srivastava, and Mark Williams
- 7 Enhancing Innovation Finance 163
 Inderbir Singh Dhingra

Technical Appendix 187
Bibliography 193

Index 197

Boxes

- 1.1 Broadly Based Innovation Activities 28
- 1.2 Innovation Foresight Processes in Canada and the Netherlands 44
- 2.1 Private R&D in Pharmaceuticals 51
- 2.2 R&D Links between Multinational Corporations and Academia 53
- 2.3 International Programs to Stimulate Early-Stage Technology Development 60
- 2.4 CSIR: Restructuring from Technology Development for Self-Reliance to Internationally Competitive, Market-Driven R&D 64
- 2.5 International Examples of Supporting High-Risk Technologies: DARPA and ATP 68
- 2.6 Hsinchu Science Park 75
- 2.7 Collaborative Public-Private Partnerships: ICICI Knowledge Park and the Center for Genomic Application 76
- 2.8 The Israeli Binational Industrial Research and Development Program 79
- 3.1 Technology Licensing Contracts 90
- 3.2 Ministry of Small Scale Industries: Selected Metrology, Standards, Testing, and Quality Initiatives 96
- Ministry of Small Scale Industries: Selected Technology Upgrading Initiatives
 99
- 4.1 Public Research for Development 108
- 4.2 University-Enabled Initiatives 109
- 4.3 Fortune at the Bottom of the Pyramid Initiatives 110
- 4.4 International Public Good-Type Innovation Efforts 112
- 4.5 Grassroots Innovation Networks: HBN, SRISTI, GIAN, and NIF 114
- 4.6 Models for Promoting Inclusive Innovations 115
- 4.7 Approaches to Designing Intellectual Property Rights for Traditional Knowledge 119
- 4.8 China's Spark Program 121
- 4.9 The Experiences of Agriculture Technology Management Agencies 122
- 4.10 NGO Initiatives and Rural Networks 123
- 4.11 Indian Initiatives for Corporate Social Responsibility 125
- 5.1 Malaysia's Human Resource Development Fund 138
- 5.2 India's Higher Education System 140
- 5.3 Training Offered by the Private Sector in India 142
- 6.1 The Impact of ICT on Small-Scale Fishing Enterprises in Kerala 150
- 6.2 What Are National Research and Education Networks? 154
- 6.3 Applications by National Research and Education Networks 155
- 6.4 Trends among National Research and Education Networks in Europe 158
- 7.1 International Experience with Funds of Funds to Spur Public-PrivateVenture Capital Funds 175

Figures

- O.1 Unleashing India's Innovation Potential 3
- 1.1 India's Dualistic Economic Structure 25
- 1.2 Contributions to Real GDP Growth, by Industrial Category, 2001–06 27