Index

absorptive capacity 13, 129, 141, 158–9, 168, 173, 183, 190, 198
ACF (advocacy coalition framework) 88, 94–6, 114–15
advocacy coalitions in Brazil 104–9, 113–15 in South Africa 109–15
Africa modes of innovation in 127–33 national system of innovation effects of STI policy on 146 emergence of new, legally defined 132 evolution of 127–9 general classification of 130–131 see also Algeria; Nigeria; North Africa; South Africa; sub-Saharan Africa; Tanzania
African National Congress (ANC) 102–3, 109–10
Algeria attempts to integrate S&T into economic development 162–3 complex innovation systems construction 151 Department of Scientific Research 164 emerging innovation systems future direction for 174 stages accelerating emergence stage 167–72 pre-emergence through creation of coordinating structures and research programmes 165–7 setting preliminary conditions 163–5 take-off 172–3 exclusion of players 155 factors harmful to technological capability 161–2 Ministry of Higher Education and Research (MESRS) 163–4, 167 National Centre for Scientific Research (ONRS) 164–5 National Research Council (CNR) 164 patent rankings 162, 170 policy limitations 173 Programmes Nationaux de Recherche (PNR) 166–7 R&D spend 158 scientific research and technological development (SRTD) plan 167
first phase 499–500
second phase 500–501
solar power, clean water and social inclusion 498
summary of 509
Centre for Research and Development for Small Family Farming (CIPAF) 495, 498, 504–9, 511
Cliope Group 495, 498–500, 509, 517
CONICET (National Scientific and Technical Research Council) 44, 517
Experimental Centre for Affordable Housing (CEVE) 495, 498, 501–4, 509–10, 517
learning and constraints 509–11
changes in socio-technical alliances 512–13
shifts in problem–solution dynamic 511–12
from transfer framework to knowledge bargaining 513–14
National Institute of Agricultural Technology (INTA) 495, 498–9, 504–9
National Programme for Small Family Farming (PNPAF) 495, 498, 504–6
preliminary definitions 496–7
theoretical and policy failures 494, 509, 514–16

Bayer Corporation vs. Natco Pharma 337
Boogotá Manual 19
bottom of the pyramid (BOP) 21, 70, 386, 413, 493
Brazil
APLs (local production arrangements) 108
bolsa familia programme 106
Cardoso administration 104–5, 109
CNPq 44, 105
dictatorship supportive of industry 45
as fast-growing emerging country 63
FINEP innovation agency 105, 109
fome zero (zero hunger) programme 106
Franco, I. 105
good effects on reducing inequality 23
health policy 383–4, 391
as influenced by Washington Consensus’s recommendations 53
innovation policymaking
ACF for innovation policy in 114–15
implications for advocacy coalition in STI policy subsystem 104–9, 113
Innovation Law 108–9, 113
natural resources 96
performance in S&T indicators and inequality 97
structural inequalities and racial cleavages 98–100
varieties of capitalism, skills innovation and economic policy 100–104
Lula administration 102, 106, 108–9, 114
micro-electromechanical systems development 473
Ministry of Science and Technology (MCT) 105–8
National Industry Federation (CNI) 103
national system of innovation factors affecting efficiency of 42–3
innovation policymaking in 96–109, 113–15
national wealth devoted to STI 377
PADCT (Support Programme for Development of Science and Technology) 100, 104–6
R&D
funding by government 363
generosity of tax regimes with respect to 330
industrial funding 362
number of researchers per million people 320, 346
research agency created 44
Index 523

rise in global scene 40
science, technology and innovation (STI) policy
change in rationale for 115
implications for advocacy
collegation 104–9, 113
origins of 96, 99–100
Secretary for Social Inclusion
(SECIS) 106–8
sharp class disparities in 2
showing internal tensions 49
Social Technology Network (RTS) 108
vocational technological centres
(CVTs) 107
BRICS countries
catch-up theory 173
developing world looking at
experiences of 151–2
engagement with Africa 131
high levels of inequality 2
as latest new node of global
capitalist power 132
national system of innovation 23, 151
rapidly emerging countries 10
and social inclusion 23–4
STI policy models extended to 205
business models for innovation, new
63–5, 72, 79

clusters
analysis of 312–13
approach 20
in Brazil 107–8
configuration for innovation 224
and STI policy 189–92, 205
in Thailand 194
in Vietnam 416–30
CMEs (coordinated market
economies) 100–103, 106
Colombia
Colciencias
as Colombian national science
foundation 26
governability of
access to and diffusion of
information 255–6
efficacy in allocation of
resources 254–5
facilitation of public–private
relationships 257
international cooperation
252–3
learning and innovation 253–4
organizational openness and
transparency 254
policy networks 256
social systems 256–7
landmarks for 240–241, 245
legal and regulatory framework
as determinant in history
of 244
loans given to 243
opportunities and threats 233–4,
258–9
role 250
Science and Technology law
enacted 239–40
within SNCTI structure 247
and STI law 245, 248
and STI projects 250–251
use of Sábato’s triangle 236–7
CPNCyT (Councils of National
Programmes of Science and
Technology) 242, 246, 256
FFJC (Fund Francisco Jose de
Caldas) 246–50
national system of innovation
approach 232, 235–8
coordination of 248

China
environmental quality 412
as fast-growing emerging country
63
‘historical take-off’ of IPR system
153
innovation and social inclusion
23–4
micro-electromechanical systems
development 473
researchers per million people 320
rise in global scene 40
showing internal tensions 49
unleashing potential of firms
as producers of innovation
outcomes 78

catch-up
innovation systems (CIS) 154
theory 156, 173
creation of 243
development of 243–4
future direction for 259
representations of 237–8
SNCTI 233–4, 239, 241, 244–7, 250–252, 256, 258–9
use of concept to set up infrastructure 232
SNCYT (National System of Science and Technology) 232, 239–44, 246, 254–5, 257
STI system
background 239–40
concepts relevant to 232–3
five stages 238–9
governance of 233–4, 252–7
new resources for STI activities 248–51
opportunities and threats 258–9
profound transformations 233–4
recent transformations 244–5
royalties 241, 245, 248–59
STI law 1286 of 2009 245–8
structure of SNCTI 247
theories in action in 234–8
use of NSI approach 232
communitarian innovation 436, 442–3, 447–60
community management framework 436, 438–41, 458, 460
CONACYT (Consejo Nacional de Ciencia y Tecnología) 44, 207–10, 212–16, 470, 472, 475–6, 480, 484, 486
constraint-based innovation 60
Costa Rica
Association of Rural Water and Sanitation Systems (ASADAS)-organized communities 443–8, 450–455
Blue Flag Ecological Program (BFEP) 436–7, 443–9, 451–2, 454–6, 460–461
community-based innovation dynamics
community capacities 451–4, 457
community in all categories 458–9
community participation 447–51, 456–7, 461
institutions 454–8
community management (CM) 436–41, 458, 460
institutional analysis and development (IAD) 436–7, 439–40, 454
policy implications 460–461
Sanitarian Quality Seal Program (SQSP) 437, 443–6, 448–9, 451–2, 454–6, 460–461
science, technology and innovation (STI) policy in 437, 460–461
suitability for case study 442–3
systems of innovation (SIs) 436–41, 458–60
theoretical implications 458–60
WSS in 444–5
dance metaphor (innovation policy)
in Colombia 234–5, 242, 244–5, 251, 259
creative dancing
emergence of new and more relevant policies and programmes 22–4
emergence of new and more relevant theories and concepts 19–22
dance floor composed of set of rules and actions, in Mexico 206–7, 226, 228
dancing with innovations 268–70
without listening to the music 39, 41, 51
dancing partners
differences in diverse countries 379–80, 407
harmony for development 375
mutual learning 379
objectives pursued by 407–8
policy and practice 270–277, 359–62
tensions between 287, 309–10
theory and policy 277–81, 362–5
theory and practice 281–6, 300, 366–9
translated to government, industry and ERIs 358–71
in Fonseca Gulf 293, 300, 307–10
as heuristic to identify failures and opportunities 7–10
insights in developing countries inclusive innovation 412–14, 430
innovation policy 410–412
innovation practice 408–9
innovation theory 409–10
leading dance partner
governments as 179
policy as 15–18
practice as 18–19
theory as 10–15, 277–81, 286
in Nigeria 347, 358–71
in North Africa 152, 173–4
in sub-Saharan Africa 119–20, 126, 132–3, 145–6
in Tanzania 266–7, 269–87
in unequal societies 87–8, 115
in Vietnam 414–16, 426–31
demand, effective 159–60, 173–4
Department of Science and Technology (DST)
India 324, 329, 331–2
South Africa 110–112
dependency theory 43, 45, 47, 52, 54
development approaches
development as freedom 19, 388
learning school 65–8, 72
scarcity-induced innovation 68–9, 72
export-led models of 20
programming 64, 70–71
developmentality paradigm 39, 49–50, 52
DUI (doing, using and interacting) 53, 151, 156, 188, 194, 410, 425, 427
‘Dutch disease’ 162
ECLAC (Economic Commission for Latin America and the Caribbean) 380–384, 387–91
economic policy
affecting industry 354
in Brazil and South Africa 100–104, 113
British colonial 348
in North African economies
in Libya and Mauritania 163
research priorities reflecting 166
in Puebla region of Mexico 477–8
role of STI policy 90
in Tanzania 145–6, 266
education
in Algeria 163–4
in Costa Rica 443–4, 446, 449, 451–2, 461
of fishermen in Fonseca Gulf 307, 310
in Latin America 383, 389–90
within modes of innovation 123–4
South Africa and Brazil 99, 103, 107, 113–15
and STI policy 185–7, 195, 200, 461
in Tanzania 138, 140–141, 144, 266, 278
emerging innovation systems (EIS) characteristics
broken trajectories and de-learning 156–7
inappropriate environment 157–8
neglected DUI dimension 156
weak linkages and exclusion of players 155
emergence
concept of 154
difficult
in Algeria 163–72
in North African countries 161–3, 168–72
drivers for
absorptive capacity 158–9
effective demand 159–60
guarantee of innovation effort 160
public procurement 160–161
innovation systems
complexity of building 151–2
stimulating innovation dynamics 152–3
take-off
analysis of 172–3
paradigm 153–4
weakness of policies and future directions for 173–4
export-led models of development 20
failures
balanced analysis of 6–7
dance metaphor as heuristic to identify 7–10
innovation efforts 297
market 78, 90, 160–161, 187–8, 197, 237
in Nigeria 346, 356–7, 363–5, 368
of NSIs in Latin America 38–9, 41, 46, 51
policy 119–20, 135, 142, 152, 179, 356, 494–7, 509, 514–16
practice 509
social capital 18–19, 257
in South Africa 78
theoretical 10–15, 152, 494–7, 509, 514–16
of ‘villagization’ reform 142
FCCyT (Foro Consultivo Científico y Tecnológico) 208, 213, 216–19, 225
fishing sector see Fonseca Gulf
Fonseca Gulf
CENPROMYPE 311–13
innovation and performance within value chain 306–9
innovation management for inclusive growth
concepts relevant to 293–4
governance and global value chains 299–300
inclusive growth and social dimension of sustainability 298–9
innovation and systems of innovation 296–8
innovation theory and practice 300
sustainable development concept 294–5
methodological elements 292–3, 300–301
policy implications
coordination of efforts 311–12
financial scheme consolidation 310–311
improving capacity for strategic vision 312–13
institutional strengthening with sustainability vision 310
integral vision of business 311
towards diversification 312
small-scale fishing sector
actors of value chain 302–3
characteristics 301–2
environmental aspects 305–6
fishermen 303–5
as stagnant, in situation of survival 292, 309
study conclusions 309–10
frugal innovation concept 20, 23, 60, 64, 332–3, 386–7, 413
FUMEC (Mexico-US Foundation for Science) 465–6, 469–77, 479–90
global South
commitment to improve development dynamics in 40
Globelics working for 18
implications for public policy 72–9
literature review relevant to 61–72
optimistic view of potential for innovation in 64–5
STI policy
future directions for 79–80
as underperforming 59, 69, 72–3
globalization
affecting integrity of NSIs 127–8
of capital 125–6
enhancing ability to outsource 122
impact on importance of nation state 49
impact on universities 349
increasing significance of innovation 405
need for framework incorporating rapid rise in 40, 48
reducing labour power 131
Globelics (Global Network for Economics of Learning, Innovation, and Competence Building Systems) 18, 40, 70–71
industrial technical centres (ITCs) 167–9
inequality
advanced knowledge-based 389, 402
in Brazil 23, 97, 102, 114–15
broad social, in Latin America 44
economic growth as insufficient condition for overcoming 10
efforts to reduce, in South Africa 109–13
increasing rates of 1–2, 22, 87
inherited from apartheid 135
innovation fostering 385–7
in NSI literature 92
policies and practices leading to increased 14–15
putting pressure on policies 392
questions surrounding contribution of innovation policy to 87–8, 113
in South Africa
income 143–4
performance 97, 101, 114–15
and STI 377, 380, 382, 384, 388, 392, 396
structural
and racial cleavages 98–100
in VoC theory 92–4
in systems of innovation framework 88–9
information, access to and diffusion of 255–6
innovation
cluster-based 416–30
communitarian 436, 442–3, 447–60
as complex process requiring systemic approach 39
constraint-based 60
definitions 60–61, 405–6
effort
critical success factors for 64
failure in 297
guarantee of 160, 174
inclusive 412–14, 423–30, 434
management of, for inclusive growth 293–300
modes of
in Africa 127–33
cases of South Africa and Tanzania 133–45
implications for STI policy 145–6
theoretical base 120–127
new business models for 63–5, 72, 79
and performance within value chain 306–9
pro-poor 25, 70, 87, 104–9, 115, 380, 385, 397
relationships with knowledge and social inclusion
comparison of approaches 393–4
direct approaches to 385–8
indirect approach to 381–4
reverse 60, 64
scarcity-induced 68–9, 72, 76
significance of 405
skills for
in Brazil and South Africa 100–104
in VoC theory 92–4
for social inclusion 3, 22–3, 393, 505, 514
for social purposes 70–72, 80
and systems of innovation 296–8
theory and policy 406–7
‘tinkering’ with concept of 269–70
helping to explain learning processes and gaps in STI policy 286–7
with policy in practice 271–7
between theory and practice 282–6
Innovation Fund 110–111
Innovation Law 108–9, 113
innovation policy
analysing process of 94–6
approaches 21–4
in Colombia 235, 241, 245, 248
concerns about appropriate unit of analysis in 77
dominant focus on competitiveness in Latin America 22
emergence of ideas, rationales and instruments of 7, 234, 292–3, 407
focus of discussions on 385
fragmentation of, in South Africa 135–6
importance of communities as main targets of 20
inadequate, in sub-Saharan Africa 119
and inequality in systems of innovation framework 88–9
as mainstream model 210–212
most recent, in India 319, 321–7
neglecting S&T 211
perceived main challenges 11
as policy system 195
potential theoretical failures blamed for misleading 12–13
role for development
need for better understanding of options for change 4–6
perspectives on
conservative view 3
progressive view 3
radical view 3–4
role of, in innovations systems literature 89–91
theoretical debate 410–412
turn from traditional and competitive-based 23–4
in unequal societies
questions surrounding
contribution of 87–8, 113
STI policymaking 96–115
synthesis and conclusions 113–15
towards theory for analysis 88–96

see also dance metaphor
(innovation policy)
innovation policymaking
in Brazil and South Africa
ACF for 114–15
implications for advocacy coalitions 104–13
natural resources comparison 96
structural inequalities and racial cleavages 98–100
VoC, skills, innovation and economic policy 100–104
in Latin America 70–71
NSI falling short in analyzing 88
innovation practice, policy and theory (IPT) see dance metaphor
(innovation policy)
innovation strategy
aspects of as trade-offs 66
at enterprise level 62–3, 79
knowledge management and learning as essential parts of 298
OECD’s objective 206
innovation studies
centre of gravity in 77
centration on national, sectoral and regional systems of innovation 436
as determined by elements from evolutionary economics, economic history and geography 91
dominant design 69, 73
finding that innovations in emerging economies occur in informal economy 20
innovation practice influenced by 300
Northern and Southern 48
as not completely static 74–5
overlap with strategic management 74
popular subjects in 87
providing ‘conceptual practices of power’ 47
as relatively new field 59
rigidities characterizing field of 74
significant expansion of 37
significant findings on relationship between innovation and inequality 92
systems of innovation framework in 88–9
innovation system (IS)
alignment of STI policy to contextualizing, according to ideal types of 189–90
horizontal 187, 195–200
types of 186–7
vertical 187–8, 190–194, 200
in Costa Rican study 436–41, 458–60
definition 183
and innovation 296–8
perspective 181–2
policy, STI policy as 182–3, 198–200
as widely disseminated concept 198
see also national system of innovation (NSI)
institution building, trajectory of 207–10, 225
institutional analysis and development (IAD) framework 436, 439–40, 454–8
intellectual lock-in 69, 73–7
Inter-American Development Bank (IDB) 45, 76, 240, 243, 259, 465
international cooperation 252–3
international research collaboration paradigm 13
isomorphism 11
knowledge
absorptive capacity for creation of 159
access to 299
accumulated 121–2, 138, 156–7, 395
assumption of, as public good 197
bargaining 497–510, 513–16
-based inequality 385–6
cities 168, 170
co-production of 400
community acquisition of 459–60
competition 151
demand for 159, 161, 225, 378
democratization of
developmental universities as example of 392, 395–403
requirements for 380–381
strategy for 388–92
as tool for development 380
developing countries dependent on industrialized countries for 410
as development 19
dissemination of new 488–9
ecologies analysis 75–6
‘economically useful’ 268
‘ecosystem’ 170
enterprises as main users of 232
exchange between actors 269
exploitation 365
flows
bidirectional 61, 79
in Nigeria 366, 369
unidirectional 502–3
generating new scientific 89, 359
of global South firms 65–6
heterogeneous and homogeneous 93
hierarchy of technical 498, 509, 515
incorporating into policymaking 60
increasing environmental 448, 452, 457
indigenous 3, 409
-intensive entrepreneurship 326–7
lack of demand for, hurting legitimacy of STI policy 374
lack of, in case of Fonseca Gulf fishermen 304, 307–9, 311
and learning 67–8
local 19, 54, 64, 199, 460, 487, 494–5, 503, 505–6
management 298
models to study 234–5
and national systems of innovation 93, 110, 135, 138, 243, 255
new economic 153
ownership of assets of 323
paradigm 69, 74
relation with innovation 60–61
relationships with innovation and social inclusion
comparison of approaches 393–4
direct approaches to 385–8
indirect approach to 381–4
role as resource 62
scientific and technological 396, 464–6, 506, 515
supply and demand of 209, 213
tacit 126, 156–7
transfer 45, 167, 169–70, 224, 299–300
workers, Nigerian 350
‘laissez-faire’ approach to markets 13, 90, 104
Latin America
and hierarchical market economy
94, 103
historical trajectory of STI regimes
43–6, 51, 54
influential school of thought 235–6,
240
innovation policymaking in 70–71
investments in absorptive capacity
198
lack of studies on developments
in 40
main strategy of social inclusion
in 493
micro-electromechanical systems
development 473
national system of innovation
avoiding pitfall of reification
52, 54
breaking OECD ‘charmed circle’
43–6
critique of reification of 40–43,
47–8, 51
‘dancing partners’ metaphor 39,
41, 51
as ex-ante concept 41, 238
new directions for research in
47–52
politics in 53
relevance of 50–51
theoretical power of 38–9
as unlikely to emerge naturally
41
visible normative reification of
41
philanthropic causes 466–7, 469
RICYT (Red Iberoamericana de
Indicadores de Ciencia y
Tecnologia) 45
Sábato Triangle 392, 395, 465
science, technology and innovation
ECLAC approach to 381–4
comparison with knowledge
democratization 390–391
lack of focus on demand 387–8
limitations faced by 389
spending
and dance partners 379
national wealth devoted to 377
structure of 378
science, technology and innovation
(STI) policy
centralization or decentralization
of 196
characterized by linearity 196–7
contextualizing 189
poor coordination among,
national public agencies 196
study of responsible research and
innovation in 22
technological upgrading through
trade liberalization in 199
theoretical and policy failures 494
value chains in 49
see also Argentina; Brazil;
Colombia; Costa Rica; Fonseca
Gulf; Mexico
LDCs (less developed countries)
broken trajectories and de-learning
156–7
characteristics 155
inappropriate environment 157–8
neglected DUI dimension 156
learning
and constraints 509–15
de-learning 156–7
first-order 132–3, 145, 300
and innovation 253–4
process case study 282–6
second order 132–3, 145–6, 300
by using 271–2, 274–7
learning school 65–8, 72
legislation
changing rules of the game 221,
223, 226
continuous change in 226–7
evolution in STI, in Mexico 212–15
expression of stakeholders 216–19
linear model of innovation 12, 152,
194, 494
LMEs (liberal market economies) 100,
102–3
Maghreb countries see North Africa
management approaches to STI
policy
innovation strategy at enterprise
level 62–3
new business models for
innovation 63–5, 72, 79
research handbook on innovation governance for emerging economies

MDGs see Millennium Development Goals (MDGs)

Mexico
- challenge of fostering capability building in 196
- CONACyT 44, 207–10, 212–16, 470, 472, 475–6, 480, 484, 486
- FCCyT 208, 213, 216–19, 225
- General Council for Scientific Investigation, Technological Development, and Innovation 213–16
- INIC (Instituto Nacional de la Investigación Científica) 44, 208
- institution building trajectory 207–10, 225
- micro- and nanotechnology (MNT) growth in development of 464–5
- human resources training 481–3
- installation of S&T infrastructure 476–80, 489
- Mexico-US Foundation for Science (FUMEC)
  - board of governors and political network 471–2, 479, 487
  - central role in promotion of technologies 483–6
  - characterization and qualification of roles played by 487
  - evolution of, and philanthropic origins 469–70
  - funding and institutional independence 470–471
  - initiatives for installation of infrastructure 476
  - in MEMS 472–86
  - Microsystems Programme 473–5, 477, 479, 481–4, 487, 490
- micro-electromechanical systems (MEMS)
  - dates in development of 475
  - emergence of 472–3
  - FUMEC in 474–88
  - growth and development of 474–88
- relationships in process of installing and developing 480
- specialist scientific training activities in 482
- modelling relationships among organizations involved in 465–6, 488–9
- philanthropic organizations and NGOs in S&T development 466–9, 487–8
- promotion, dissemination and commercialization 483–5
- national system of innovation future direction for 227–8
- institutional framework and governance advances in regionalization process 215–16
- evolution of legislation 212–15
- expression of stakeholders 216–19
- rules of the game and governance 219–22
- as strengthened and advanced over time 225
- tensions hampering functioning of system 222–5
- national wealth devoted to STI 377
- REDNACECyT (National Network of State Councils) 213, 215–16
- research agency created 44
- science, technology and innovation (STI) policy evolution of 207–10
- governance and institutional framework 212–19
- and rules of the game 219–22
- incipient process of constructing public 225
- overview of experience of 225–8
- tensions hampering functioning of system 222–5
- Special Programme for STI (PECITI) 208–9
- micro- and nanotechnology (MNT) see Mexico
- Millennium Development Goals (MDGs) 1–2, 29, 140, 266
‘Mode 2’ model of knowledge production 13, 465
modes of innovation in Africa 127–33
cases of South Africa and Tanzania 133–45
implications for STI policy 145–6
theoretical base 120–127
Multimedia Super Corridor (MSC) 170–171

National Department of Planning (DNP) 240, 246, 248–50, 260
national innovation systems see national system of innovation (NSI)
national system of innovation (NSI) approach
adequacy to reflect non-OECD realities 41–3, 46–52
broad version of 136–8, 143–5
calls to systematize 38–9
combined with global commodity chains 293, 300–301, 309–13
concept as ex-ante 41, 238
as ex-post 238
as underexploited 232
usefulness of 46
consisting in, rather than theory 38
as could benefit from being more encompassing 39, 51
emerging (EIS)
analysis of missing stage 172–3
challenges of 161–72
characteristics 155–8
factors driving 158–61
future directions for 173–4
relevance of 154
explaining wider political economic structures 94
far-reaching ambition sustained by 37
favoured dimensions 39
for formulating STI policies 181–3, 185
alignment 186–8, 190–200
contextualizing according to ideal types of 189–90
framework complementary to 93
influential nationally and globally 38
innovation policy and inequality in 88–92
and macroeconomic goals 42–3
as means of pursuing STI 392–3, 395
misunderstanding of 18
narrow version of 133–6, 143–5
placing of innovation 121
privileging government and enterprises 395
reductionist version of 46, 51
roots of 37
specificity as hallmark of 132
undermining effects of 12
wide application of 40
consequences of shortfalls of 77
and control 122, 126
definition 37–8
early occurrences 37
and first-order learning 132–3
historically grown parameters 95
importance of demand for new products and services to 160
innovation policy and inequality in 88–9
as innovation policy dance 119–20, 126
integrity of, affected by globalization 127–8
in LDCs
broken trajectories and de-learning 156–7
characteristics 155
inappropriate environment 157–8
neglected DUI dimension 156
limitation of 88
literature of inequality in 92
role of innovation policy in 89–91
main requirement of 128–9
purpose of 110
see also emerging innovation
systems (EIS); innovation
system (IS); individual countries
natural resources
in Argentina 503
in Brazil and South Africa 96, 114
in Colombia 233, 245, 260
in Costa Rica 445, 448, 451, 454,
456, 458, 461
governance routines oriented
towards 16
in North African economies 166
STI as issue related to 44, 50
in sub-Saharan Africa 128
in Tanzania 147, 270, 278
neoliberal approach to markets 13,
100, 102, 140
neoliberal commitment 42, 51
NGOs
in Brazil 104, 108–9, 113
in Costa Rica 438
as innovation-producing actor 9
in S&T development 466–9
in South Africa 112–13
in Vietnam 417
Nigeria
as Africa’s most populous country
345
challenges of S&T policy
implementation 356–8, 370
education and research institutions
(ERIs) 346
Federal Ministry of Science and
Technology (FMST) 353, 355–6
formulation of implicit and explicit
S&T policies in
agricultural policy 354
education policy 353
industrial and economic policy
353–4
S&T policy 354–5
future directions for 370–371
historical development of S&T
institutions in
during Colonial era
industrial organizations 348
S&T institutions 347–8
S&T policy 348–9
post-independence
industrial organizations
351–2
polytechnics 350
research institutes 351
S&T policy and governance
352–3
universities 349–50
innovation policy dance in
government and ERIs 362–3
conducting research in areas
of interest to government
364
education, training and
development of human
resources 363–4
funding of education and
R&D by government 363
promotion of institution–
industry interactions 365
protection of intellectual
properties of ERIs 364–5
government and industry 359–60
encouraging industrial
funding of research 362
encouraging industrial use of
local raw materials 361
provision of infrastructure by
government 360–361
industry and ERIs
industrial funding of research
in ERIs 369
industry commercializing
research outputs of ERIs
367–8
industry reliance on ERI for
trained personnel 366–7
industry reliance on ERIs to
resolve problems 367
interactions of industries with
ERIs 369
three main actors 358–9, 370
National Centre for Technology
Management (NACETEM)
346, 351, 356–7, 362–3, 368
National Council of Science and
Technology (NCST) 352–3
national system of innovation
approach for evaluating STI
endeavours 355
government role 371
interactions between elements of
346, 365, 369–70
new STI policy for 355–6
weak STI capabilities reflected in 346
petroleum and natural gas industry 345
poor STI capacity 346
possible cause of weak research–industry interactions 346–7
Raw Materials Research and Development Council (RMRDC) 361–2
NIS see national system of innovation (NSI)
North Africa
appropriateness of catch-up paradigm 173
complex innovation systems construction 151
emerging innovation systems (EIS) 161–72
industrial technical centres attractive to 168–9
innovation as relatively inaccessible in 155
lack of technological progress 161, 163
as largely ‘falling behind’ 162
as late-industrializing 153
and Multimedia Super Corridor 170–171
need for fully operational innovation systems 154
networking of innovation players 170
not yet reaching take-off stage 171–2, 174
poorly documented phenomenon in 152
specific weaknesses 174
technopoles programme in 169, 171–2
see also Algeria
Novartis AG vs. Union of India 338
NSI see national system of innovation (NSI)
OAS (Organization of American States) 43, 44, 54, 236, 240, 252, 255
OECD
breaking ‘charmed circle’ in Latin America 43–6, 51, 54
definition of innovation 12
definition of research 12
finding optimal policy mix as continuous process 211
on income inequality 1–2, 385
national mapping and review approaches 38
objective of innovation strategy 206
potential theoretical failure examples 12
private spending 383
project aim 385
on South African NSI 119
TIA recommended by 111
opportunities balanced analysis of 6–7
for Colciencias 233, 239–40, 248, 251
for Colombian SNCTI 258–9
for communities 457
dance metaphor as heuristic to identify 7–10
decisions based on available 269–70
of developing country firms 64
emergence of new and more relevant policies and programmes 22–4
emergence of new and more relevant theories and concepts 19–22
employment 421
and global value chains 299–300
inclusive growth for 298–9
innovation for growth 297
long-term structures 95, 115
micro-electromechanical systems technology as window of 474, 477, 483–6
of national innovation systems in Latin America 47–52
for Nigeria’s NSI 355
in tea sector 275, 285–7
technological development opening 89–90, 160
organizational openness and transparency 254
patents policy in India 334–42
policies and programmes, new and relevant 22–4
policy failures 119–20, 135, 142, 152, 179, 356, 494–7, 509, 514–16
policy networks 256
post-colonial histories of Nigeria 349–53
of South African NSI 120, 133–6, 141
of Tanzanian NSI 120, 136–8, 142
post-colonial science and technology studies (PCSTS) 47
pro-poor innovation activities in Brazil 104–9, 115
concept 87, 380
indirect 397
and innovation practices 70
as not a priority 25
report on 385
interventions 494, 514–15
solution 509
public–private interaction 161, 209, 257, 325
public procurement 160–161, 173–4, 321
‘publish or perish’ paradigm 13, 226
R&D (research and development)
in Algeria 151, 158, 164, 167–8
in Argentina 497–509, 514
BERD (R&D expenditure of business enterprise sector)
in Brazil and South Africa 97
in India 328, 331–3
in Brazil 97, 320, 330, 346, 362–3
in Colombia 232, 238, 247, 250, 254, 257–8
developing country vs industrialized country intensity 69
effective demand for 160
in Fonseca Gulf 298–9
in India
BERD in 328, 331–3
financing 325, 327
foreign direct investment companies 323
GERD in 319, 322, 326, 328
goal to establish world-class infrastructure 322
improving scientific human resources for 318–20
increasing share of foreign companies in performance of 342
industries of high concentration 323
lacking timely data on 324
private sector investment in 323–4
STIP considered as innovation policy 324
tax policy with respect to 317–18, 325, 327–33, 341–2
innovation assessed by 406
investment of STI inputs 378
laboratories, science policy focus on 89
in Latin America 199, 377
in Mexico 208–9, 211, 222, 226
and modes of innovation 123
narrow approach of innovation policy 90
non-conflation of innovation with 61
in North Africa 156–8, 170–172, 174
NSI literature going beyond focus on 37
package of theory, policy and practice representing problems for 496
private sector firms underinvestment 80, 185
relationship with poverty levels 1, 3, 385
in South Africa 97, 111, 139–40, 346, 362–3
and STI policy 188–9, 193, 197, 406–7
in sub-Saharan Africa 119
in Tanzania 139–40, 142, 144, 265, 277–80
of water supply and sanitation systems, in Costa Rica 443
and Western expenditures 408
racial cleavages 98–100, 102, 114, 120, 136, 141
Regional Innovation Systems 19–20, 436
resource allocation, efficacy in 254–5
Responsibility Navigator 22
responsible research and innovation (RRI) 22, 375
reverse innovation 60, 64
rules of the game
conflicts with legal institutions 223–4
effect of law on 221, 223, 226
generated from STI public policy construction 225
and governance 219–22
integration and encoding 206–7
and policy makers 228
S&I law (Mexico) 207–9, 212–14, 216–17, 223, 226
Sábato Triangle 19, 392, 395, 465
scarcity-induced innovation (SII) 68–9, 72, 76
Schumpeter, J. 37–8, 405, 457, 459
science, technology and innovation (STI)
as central driver of economic growth 184
Colombian system of
background and developments 238–51
concepts relevant to 232–3
governance of 252–7
opportunities and threats 258–9
profound transformations 233–4
theories in action in 234–8
use of NSI approach 232
contribution to development 377–81
decision making 222, 224–5
development programming 71–2
ECLAC approach to 380–384
comparison with knowledge democratization 390–391
lack of focus on demand 387–8
limitations faced by 389
fostering structural change in productive system 381
and inequality 377, 380, 382, 384, 388, 392, 396
lagging behind, in sub-Saharan Africa 119
limited financial resources for 184
literature on public policy in 89
performance
in developing countries 206
in Morocco and Tunisia 163
in South Africa and Brazil 97
planning landscape, in Tanzania 142–3
for social impact, in South Africa 109–13
spend on 3
state mission wrongly conceived, in Algeria 162
trajectory of Latin American regimes 43–6, 51
science, technology and innovation (STI) policy
alignment
with innovation systems
contextualizing, according to ideal types of 189–90
horizontal 187, 195–200
types of 186–7
vertical 187–8, 190–194, 200
with national economic development agendas 26, 90, 142, 162–3
analytical models of 205–7
approach 406–7, 426–7
barriers for implementation 183–6
division of labour with social policy 381–2, 402–3
future directions for 51–2, 200
implications of modes of innovation for 145–6
from innovation system perspective 181–2
as innovation system policy 182–3, 198–200
as inspired by wrong models 152
and knowledge democratization
developmental universities as example of 392, 395–402
strategy for 388–92
lack of demand for knowledge, hurting legitimacy of 374
and mainstream model 210–212, 219, 223–4
as marginal for inequality reduction, in neoliberal framework 113
and national systems of innovation helpful for design and evaluation of 40–41
as important topic for studies of 38
need to focus on 205
not paying sufficient attention to regimes of 41–2
requiring specific 156
and relationships between knowledge, innovation and social inclusion
comparison of approaches 393–4
direct approaches to 385–8
indirect approach to 381–4
responsive to innovation performers
future directions for 79–80
implications for public policy
innovation systems models 72–3
intellectual lock-in 73–7
policy reform proceeding slowly 78–9
usefulness of literature review 72
innovation definition 60–61
literature review
development approaches 65–9
innovation for social purposes 70–72
management approaches 62–5
overview 61–2
near invisibility of, in global South 79
use of disciplinary traditions 59–60
risk of forgoing opportunities to reduce social inequalities 50
studies 40, 47–8
transversality of 210
see also individual countries
SDGs see Sustainable Development Goals (SDGs)
Sen’s development approach 19, 388
SNCTI (National System of Science, Technology and Innovation) 233–4, 239, 241, 244–7, 250–252, 256, 258–9
SNCyT (National System of Science and Technology) 232, 239–44, 246, 254–5, 257
social capital failures 18–19, 257
social dimension of inclusive growth 293–4
neglect of 39, 75
prioritized, in Latin America 44
of sustainability 298–9
social impact and development 408
isolation of policies jeopardizing 384
STI for, in South Africa 109–13
social inclusion and developmental universities 396–9
innovation for 3, 22–3, 393, 505, 514
problems and goals 398–401
R&D for 325
relationships with knowledge and innovation
comparison of approaches 393–4
diversity of direct approaches to 385–8
indirect approach to 381–4
and RRI values 22
STI for 106, 228
studies in BRICS countries 23–4
technologies for (TSIs)
case studies 497–509
failures of 514–16
learning and constraints 509–15
outstanding issue for 516
reasoning behind, and definitions 493–7
social innovation concept 20, 70, 87, 493

Stefan Kuhlmann and Gonzalo Ordóñez-Matamoros - 9781783471911
Downloaded from Elgar Online at 07/01/2019 12:22:27AM
via free access
support programmes for, in South Africa 109–13
see also Argentina
social purposes, innovation for 70–72, 80
social systems 256–7
societal process model 413, 425–30, 434
South Africa
Communist Party of 103
Congress of South African Trade Unions (COSATU) 103–4
Department of Science and Technology (DST) 110–112
ESKOM 101
failure to engage innovation performers 78
GEAR (Growth, Employment and Redistribution) strategy 102–3
Human Science Research Council (HSRC) 109
increasing attention to poverty reduction 24
Innovation Fund 110–111
innovation policymaking
ACF for innovation policy in 114–15
legislation 99, 113
natural resources 96, 138
performance in S&T indicators and inequality 97
public interests and NGO interventions 112–13
STI for social impact 109–13
structural inequalities and racial cleavages 98–100
varieties of capitalism, skills innovation and economic policy 100–104
as most industrialized and diversified economy on continent 120
National Research Foundation (NRF) 110
national system of innovation addressing participation level of innovation practitioners 145
and conditions for effective innovation performance 77
implications for STI policy 145–6
indicators for 144
innovation policymaking in 96–104, 109–15
OECD review of 119
post-colonial history of 120, 133–6, 141
prominent trend in 77
Tanzanian comparison 138–45
public bodies and private performers 78–9
R&D funding by government 363
industrial funding of 362
researchers per million people 346
Reconstruction and Development Programme (RDP) 102
science, technology and innovation (STI) policy
change in rationale for 115
implications for advocacy coalitions 109–13
implications of NSI for 145–6
origins of 96, 99–100
STISI (STI for social impact) 111–12
Support Programme for Industrial Innovation 110
Technology and Human Research for Industry Programme (THRIP) 110–111
Technology Innovation Agency (TIA) 111
telecommunications sector 66, 101
STI see science, technology and innovation (STI)
STI law 1286 of 2009 245–8
STI policy see science, technology and innovation (STI) policy
STIP see science, technology and innovation (STI) policy
sub-Saharan Africa
lagging behind on STI front 119
legitimacy of state in 127
as one of most economically underdeveloped regions in world 119
post-colonial history of conflict across 127
power configurations shaping accumulation regimes 127–9
see also Nigeria; South Africa; Tanzania
sustainability
in Costa Rica 437–43, 447, 452, 455–61
social dimension of 298–9
vision for 310
sustainable development
concept 293–5, 412
no single blueprint for 428–9
STI contributing to 392, 395
Sustainable Development Goals (SDGs) 2, 29
systems of innovation (SI) framework 436–41, 458–60
take-off
analysis of 172–3
industrial technical centres playing
significant role in 167–8
and North African countries 171, 174
paradigm 153–4
role of technopoles 168, 171
success story 170
Tanzania
Agricultural Sector Development Strategy (ASDS) 270–271
agriculture
effect of failure of ‘villagization’ reform 142
institutional framework for research 286–7
linkage between STI policy and practice 270–271
low productivity in 147
move towards minerals and ores 140
as priority sector for economic growth 137–8, 265–6
research condition 280–281
sector still flagging 138–9
semi-public R&D institutes in 278
among poorest economy on continent 120
conceptual framework for analysis 268
with emergent or nascent IS 189
Government of Tanzania (GoT) 265, 267, 281
Kilimo Kwanza 271, 274, 281
national system of innovation
implications for STI policy 145–6
indicators for 144
post-colonial history of 120, 136–8, 142
South African comparison 138–45
progress on MDG indicators 266
Science, Technology and Innovation Policy Research Organization (STIPRO) 281
science, technology and innovation (STI) policy
as gloss 287
policy
and practice 270–277
and theory 277–81
remaining at national level 286
theoretical positioning 265
theory
and policy 277–81
and practice 281–6
Tanzania Commission for Science and Technology (COSTECH) 278–9, 281
Tanzania Tea Authority (TTA) 272, 275
Tea Act 1997 272, 274
Tea Board of Tanzania (TBT) 267, 272–3, 275
tea sector
addressing labour shortages 284
effect of low input use and poor field management on 283
example of learning by using 271–2, 274–7
integrated in global value chains 282
lessons learned leading to improvements 283–4
new tea clones 279–80
privatization efforts 270
research institute for 267
trialling innovations 284–6
value-added tax levied on 271
Technology Transfer Programme (TTP) 282–4
TRIT (Tea Research Institute of Tanzania)
case study from 282–6
funding, creation and governance 267
as national agricultural research institute for tea sector 267
as participant in training 279
policy push 275–6
as tea stakeholder 273
two-level working 279–80
Wakulima Tea Company (WTC) 276–7, 284–6
tax policy evolution, in India 327–33
technological capability-building (TCB) system 66
technologies for social inclusion (TSI) approaches 494
definition 516–17
failures common to, in Argentina 494–5
inscribed on agendas of theoretical discussion and public policy 493
learning and constraints 509–14
and tensions in 497–509
technology transfer failures from rationality based on conception of 514
intellectual property offices 369–70
move towards knowledge bargaining 513–14
paradigm 13
in problem-solution relationship 511
programmes supporting 112, 279, 282–3
social inclusion projects dominated by frameworks of 494–5, 509
and TRIPS compliance 339
in Vietnam 414, 425
technopoles 168–74
Thailand
lack of alignment between policies and problems 193, 201
vertical alignment of policies in 194
theoretical failures 10–15, 152, 494–7, 509, 514–16
theories and concepts, new and relevant 19–22
TIA (Technology Innovation Agency) 110–111
‘tinkering’ with innovation concept of 269–70
helping to explain learning processes and gaps in STI policy 286–7
with policy in practice 271–7
between theory and practice 282–6
Triple Helix model 12–13, 19, 234–5, 465
TRIPS (Trade Related Intellectual Property Rights) compliance, in India 317, 333–41
TSIs (technologies for social inclusion)
case studies 497–509
failures of 514–16
learning and constraints 509–15
outstanding issue for 516
reasoning behind, and definitions 493–7
value chains actors in small-scale fishing 302–4, 309
in fragmented or dual IS 189–90
global, and governance 299–300, 309
innovation and performance within 306–9
Tanzanian 139–40, 274–6, 282
unfavourable local conditions for 49
varieties of capitalism (VoC) in Brazil and South Africa 100–104
structural inequalities and skills for innovation in 92–4
Vietnam analysis and theoretical implications 422–6
approach taken to study 413–14
Bat Trang ceramics village 420–424
cluster-level innovation 416–30
craft villages 408, 415
Duong Lieu cassava products
village 416–17, 422–3
innovation policy dance in 414–16
Phu Vinh rattan and bamboo
Village 419–20, 422–3
policy implications 426–9
Van Phuc silk village 417–19, 422–3
VoC see varieties of capitalism (VoC)
Washington Consensus 40, 42, 45, 48,
53, 100, 102, 105, 199, 384
water supply and sanitation (WSS)
systems
and community-based innovation
dynamics 436, 442–3, 447–60
community capacities 442–3, 451–4,
457
cost-sharing system for 438–9
failed solutions 436
global crisis 435
institutions 454–8
model based on conceptual
frameworks 436, 439–41
national demand for more efficient
437
participation of community 442–3,
447–51, 456–7
policy implications 460–461
research design 442–4
results and analysis
Association of Rural Water and
Sanitation Systems 446
Blue Flag Ecological Program
and Sanitarian Quality Seal
Program 445–6
community-based innovation
dynamics 447–56
WSS in Costa Rica 444–5
success depending on level of
equity and sustainability
438
sustained operation of 441
theoretical implications 458–60
world-system analysis (WSA) 47–9,
52, 54