Abler, D.G. 133
'adjusted' net domestic product (ANDP) 15
AGE models 25, 27, 128, 129–33, 212–14
analysis of environmental issues 133–7
closure 138–9
data and solution algorithms 137–8
elasticity values 137–8
incorporating environmental and natural resource depletion 133–4
'Johansen' method 129, 153, 205
modelling agricultural land degradation 135–7
Sri Lankan economy 180–8
export subsidy and land tax package experiment 185
land tax-subsidy package experiment 185
production tax-subsidy package experiment 185
productivity impact parameter (PIP) 180, 185, 187–8
tax-subsidy package experiment 184–5
trade liberalization cross 186, 187–8
trade, tax and environmental policy experiments 181–8
standard approach 129
technological and behavioural relationships 130
Thai economy, PARA model 204–10
see also APEX model of Philippine economy
agricultural development and food policy 63–8
uplands 69–72
expansion of market 71, 72
agricultural development policy, environmental linkages 68
agricultural intensification, deforestation and migration 95–103
agricultural land degradation modelling 135–7
agricultural policies, Philippines 149–51
agricultural production 5
agriculture 35
Asia 58–62
lowland 108–9
newly industrializing economies 58, 61
Philippines 62, 72, 142–3, 144–5, 149–51, 156, 157, 162–3
and policies affecting 110
share in total exports 21
Thailand 193–4, 195–202
trade liberalization in 26
uplands 69–72
air pollution
Asia 8
Philippines 146–7
Alavalapati, J.R.R. 133
Alexandratos, N. 9
analytical approaches 26
to the trade-environment relationship 29–51
Anderson, J.R. 22
Anderson, K. 133
Angelsen, A. 133
anti-government movements 67
Antweiler, W. 25, 30, 32, 37
APEX (Agricultural Policy Experiments) model of Philippine economy and the Green Revolution 163–8
structure 153–4
trade policy reform 155
applied general equilibrium (AGE) models see AGE models
Armington elasticities 154
Asia
  agriculture 58–62
  air pollution 8
  capital accumulation 55
  cereals 63, 64, 68
  development strategies and outcomes 53–62
  export-oriented industrialization (EOI) 58
  exports 59
  GDP 54
  industrialization policies 58–62
  manufacturing growth 53, 55
  policy reform 55
  population 7
  primary product processing 53
  production structure 55
  water shortages 9
Asian developing countries
  deforestation 10
  land degradation 13
Asian Development Bank (ADB)
  172
Athukorala, P. 58, 61
Babiker, M.H. 133
Baldwin, R.E. 58
Bandara, J.S. 180
Bandarathilake, H.M. 181
Bandusena, W.M. 180
Barbier, E.B. 15, 22
Barker, R. 65, 67
Baumol, W.J. 107
Bautista, R.M. 58, 150
‘becak’ economy 76, 77, 118, 214
Bee, O.J. 142
Bergman, L. 133
Binswanger, H.P. 72
biodiversity 14
Bishop, G.L. 15
Bovenberg, L. 43
Brandon, J.A. 48
Brandon, C. 4
BULOG, Indonesia 67
Burkina Faso 15
Burniaux, J-M. 133
capital accumulation, Asia 55
Cassman, K.G. 11, 83, 144
Centre for International Economics (CIE) 180
cereals
  Asia 63, 64, 68
  domestic markets for 85–7
  Philippines 145, 150
  in uplands 83
Clarete, R.L. 153, 154
‘clean goods’, and ‘dirty goods’ 25, 26, 32, 34
comparative advantage 32
composition effect 25, 30–32, 34, 36, 72
environmental impacts 31
Constant Elasticity of Substitution (CES) 124, 132, 154
Coomaraswamy, A. 179
Copeland, B.R. 20, 43, 45
Costa Rica 15
Coxhead, I. 19, 57, 61, 66, 68, 72, 83, 85, 90, 136, 150, 154, 170, 180, 197, 199, 203, 204
Cramer’s Rule 123
Cropper, M. 37, 107, 108
Cruz, M.C. 61
Cruz, W. 72, 143
David, C.C. 66, 67, 83, 85, 150, 151
David, W.P. 17, 143
de Mooij, R. 43
Deacon, R. 90, 112, 118
Dean, J. 36
Deardorff, A. 31
deforestation 5–8, 9, 12
  agricultural intensification and migration 95–103
Asian developing countries 10, 212
  economic costs of 14
  measures 37
  Philippines 142, 152
  and poverty 61
  and shocks 109
  social cost 94
  and upland land degradation 81–127
Deutsch, W.D. 13, 143, 144
developing economies
  environmental degradation 24
  globalization 19–20
developing economy models 52
developing regions
  GDP growth rates 3
  population 7
development failure 17
development policies, impact in uplands 72
‘dirty goods’ 25, 26, 32, 48
Dixit, A. 91
Dixon, P.B. 130, 153
Dollar, D. 20

Earth summit, Rio de Janeiro 1
‘East Asian Miracle’ 61
economic development strategies 3
economic growth
  and declining emissions intensity 36
  and environmental quality 2
economic welfare 38–42, 93
  trade policy and environmental policy 37–47
emissions, declining intensity and economic growth 36
Engel’s law 86
environment-economy actions in open developing countries model 81–2, 87–95
changes in upland land use 124–5
comparative static results 119–24
comparative statics 97–103
limitations 116
modelling tools and solutions 91–5
spatial characteristics 82–3
stylized facts and assumptions 87–91
environmental damage 29
  and food production 16–17
environmental degradation, developing countries 24
‘environmental Kuznets’ curve’ (EKC) 17, 18, 34–6, 49
empirical tests of 37
environmental and natural resource (ENR) assets 128
environmental policies and optimal trade, in general equilibrium 42–6
environmental policy, trade policy, and economic and environmental welfare 37–47
environmental quality, and economic growth 2
‘environmental resource base’ 16–19
environmental services 32, 50
environmental taxes 40, 43, 44
Ethier, W.E. 31
export-oriented industrialization (EOI) 25, 58, 75, 76–7, 214
exports, Asia 59
extensification 125
factor endowment changes 48
factor endowment growth 34
  and price changes 31–2
factor productivity change 107
factor-neutral changes 108
Food and Agriculture Organization (FAO) 5, 11, 142
food exporting economies 75
food importing developing countries 74–5
food policy 67–8, 86, 115
  and agricultural development 63–8
food prices 98–9
food production
  and environmental damage 16–17
  and the Green Revolution 63–7
  uplands 101
food security 67, 115
  Philippines 150
foreign capital 20
foreign direct investment (FDI), Thailand 193
forest land conversion, and property rights 84
forests
  and forestry policies, Philippines 142–4, 151–3
  non-marketed benefits 14
freshwater systems, Philippines 147–8
Fullerton, D. 43
Gamage, H. 173
GDP, Asia 54
GDP growth rates, developing regions 3
Gempack software 132
general equilibrium, optimal trade and environmental policies in 42–6
general equilibrium (AGE) models see AGE models
general equilibrium approach 23, 25, 49, 81, 190
genetic reserves 14
Gérad, F. 61
Gersovitz, M.R. 70
Gillis, M. 72
global climate influences 14
‘global environment’, and trade issues 22
global warming 15
globalization, of developing economies 19–20
Glover, D. 61
Gouldner, L.H. 43, 133
government investment 67–8
grain markets 86
‘grammar of policy arguments’ 21
Green Revolution 26, 68, 75, 83, 84–5, 141, 215
and APEX (Agricultural Policy Experiments) model 163–8
effects 164–8
and food production 63–7
and the Philippines 150, 163–8
and technical progress 103–6
and wages 164
Greene, W.H. 199
Griffiths, C. 37
Grossman, G. 17, 30, 36
growth
and environmental resources 17–18
and trade, environmental effects 30–37
Hahn, F. 21
Harrison, W.J. 132
Hayami, Y. 66, 83, 85, 105
Heckscher-Ohlin model 31, 47, 48, 88–90
Hefner, R.W. 19
Herdt, R.W. 65, 67
higher-dimensional models 31
Huang, J. 67, 150
hydroelectric power (HEP) generation, Sri Lanka 177
import-substituting industrialization (ISI) 25, 55–8, 74–5, 76, 114, 214
and Asian agriculture 59–60
Philippines 149, 150
Indonesia 15, 76
BULOG 67
industrial emissions 3–4, 134
industrial promotion schemes 57
industrialization 3
industrialization policies, intersectoral consequences 58–62
institutional weaknesses 79
Intal, P.S. 150
integrated pest management (IPM) 145
costs of 107
International Rice Research Institute (IRRI) 64, 86, 151, 163
intersectoral externalities 87, 106–10
intersectoral mobility 85
inverse-U relationships 49, 50
Java 74
Jayasuriya, R. 189
Jayasuriya, S. 49, 57, 58, 66, 90, 170
‘jeepney’ economy 74–5, 77, 118, 214
Jewell, N. 174
Jha, R. 36, 37
Jiraporn, P. 61, 85, 199, 203
‘Johansen’ method, in AGE models 129, 153, 205
Jones, R.W. 90
Jorgenson, D.W. 133
Kaimowitz, D. 133
Kanok 205
Kikuchi, M. 66, 83, 85, 105
Krishnarajah, P. 181
Krueger, A.B. 17, 30, 36
Krueger, A.O. 59, 60, 62, 63
Kummer, D. 142, 152
labour immobility 102
labour market 96, 122, 123–4
labour mobility 84
laissez-faire 46
Index

land degradation 9, 11
Asian developing countries 13, 212 economic costs of 14 modelling 135–7 Sri Lanka 172
land use changes 135–6
Leamer, E.E. 31
Legg, C.A. 174
Levine, R. 20
Lewis, M.W. 19
Lindert, P.H. 83
Lipton, M. 83
Longhurst, R. 83
Lopez, R. 90, 91, 94, 97, 98 losses, valuation of 14–15 lowland agriculture 108–9 lowland regions 83 Lagana Lake case, Philippines 148
Malayang, B.S. 148
natural resource decisions 21 natural resource depletion 5 and degradation 2–14 Neary, J.P. 93 net domestic product (NDP) 15 newly industrializing economies, agriculture 58, 61 Nigeria 15 Niklitschek, M. 90, 91, 94, 97, 98 Norman, V. 91
production structure, Asia 55
productivity impact parameter (PIP) 180, 185, 187
property rights 114, 213
and forest land conversion 84
property rights regimes 49, 111
‘proton’ economy 76–7, 118, 214
Punyasavatsut, C. 197, 204
quantitative restrictions (QRs) 152
R&D 67, 75, 214
Ramankutty, R. 4
relative price changes 31
Renelt, D. 20
Repetto, R. 17, 72
Republic of the Philippines 143, 145, 147
resource allocation, and policy interventions 110–15
resource use incentives 18–19
resource-use decisions 21, 23
rice production 64–6
Roberts, K.W.S. 93
Rola, A.C. 72, 83, 145
Rosegrant, M.W. 170
Rozali Mohammed Ali 15
Ruff, F. 61
Rybczinski result 109, 195, 201
Rybczinski theorem 31, 42
Samarappuli, I.N. 180
Samaratunga, P.A. 188
Sandmo, A. 21
‘satellite accounts’ 15
scale effect 25, 30, 34, 36
Schiff, M. 60
Schultz, T.W. 60
Schweithelm, J. 61
Selden, T. 36
separability 90
Setboonsarng, S. 196
Shafik, N. 37
SHAZAM 199
Shively, G.E. 22, 68, 72, 154
shocks 52, 77–9, 90, 116–19, 128
and deforestation 109
Siamwalla, A. 196
Silvapulle, P. 170
social accounting matrix (SAM) 137
soil degradation 5
soil erosion 11, 135
off-site effects 136–7
Philippines 143
Sri Lanka 173, 177–80
tea sector 189–90
uplands 107–8
valuation
nutrient replacement cost method (NCRM) 179
value of loss of productivity method (VLPM) 179
Somaratne, W.G. 15, 180, 182
Song, D. 36
spatial characteristics 82–3
Sri Lanka 15, 76, 172–92, 215–16
AGE model 180–88
agricultural crop area 175
agriculture 62
deforestation 174, 186
development strategy 176–7
hydroelectric power (HEP) generation 177
Land Commission 174
land degradation 172, 174
land use changes 173–6
land use practices, and environmental effects 177–80
plantation sector 174
policy reform 172, 177
soil erosion 173, 177–80, 190
tea sector 180, 188–9, 190
topography 173
trade liberalization 173
Stern, D.I. 36
Stocking, M.A. 181
Stolper-Samuelson effect 99, 113, 195
‘structural sensitivity analysis’ 138
Strutt, A. 133
substitution effect 122
sustainable development 2
System of National Accounts (SNA) 15

tariff policy, and trade liberalization 110–14
tariff reduction, in PARA model of Thai economy 206–10
tariffs 40–41, 44, 74
taxes 43
environmental taxes 40, 43, 44
Pigovian tax 40, 42, 43, 184
trade taxes 46
Taylor, M.S. 20, 48
tea sector, Sri Lanka 180, 188–9
technical progress, and Green Revolution 103–6
technique effect 25, 32, 34, 36, 42–3
terms of trade 122
Thailand 75, 193–211
agricultural decline and changes in land area 195–202
agricultural land and labour demand model 197–202
agriculture 193–4, 195
capital accumulation 204
economic ‘miracle’ 193
foreign direct investment in 193
labour market 198
labour productivity 61
land retirement 202–4
migration 85
PARA model of economy 204–6, 216–17
simulation results: tariff reduction 206–10
trade liberalization 207, 209–10
Thampapillai, J. 22
three-stage least-squares (3SLS) 199, 200
Timmer, C.P. 58, 86
total pollution effect 34
total suspended particulates (TSP) concentrations, Philippines 146, 147
total suspended sediment (TSS) 13–14
Philippines 143
trade 2
trade and environmental processes, modelling, stylized facts 81–7
trade liberalization 213
AGE model, Sri Lankan economy, trade liberalization 182–4, 186
in agriculture 26
environmental impact 158–9
Philippines 152–3
and pollution 36–7, 40
sectoral effects 160–61
Sri Lanka 173
trade liberalization – continued
and tariff policy 110–14
Thailand 207
and welfare 47–8
trade policy, environmental policy and
economic welfare 37–47
trade policy reforms 32, 46–7
AGE model of Thai economy
204–10
trade taxes 46
trade-environment relationship,
analytical approaches 29–51
trade-environmental linkages 19–21
‘tuk-tuk’ economy 75, 77, 118, 208, 214
Ulph, A.M. 43
upland land degradation, and
deforestation 81–127
uplands 83
agricultural development in 68–72
expansion of market 69–72
cereals in 83
changes in land use 124–5
factor intensity 117
food production 101, 111
impact of development policies 72
Philippines 142–4
soil erosion 107–8
urban pollution 4
urbanization 3, 7
Philippines 146
US, and Mexico, trade liberalization
30
Valdés, A. 60
valuation of losses 14–15
value of loss of productivity method
(VLPM) 179
Varian, H.R. 128
Vennemo, H. 133
Vincent, J.R. 15
Vousden, N. 113
Walras’ law 131
Walrasian equilibrium 129
Warr, P.G. 153, 154, 196, 205
water resource depletion 8–11
watershed degradation, Philippines
143–4
watershed functions 5, 11–14
welfare 38–42, 93, 117
and trade liberalization 47–8
welfare effects 25
Whalley, J. 36, 37
White, K. 199
Woodland, A. 91, 93
World Bank 15, 20, 36, 58, 142, 148
World Commission on Environment
and Development (WCED) 1
World Health Organization (WHO),
Air Quality Guidelines
(AQG)146
World Resources Institute (WRI) 15,
29, 142, 145
World Trade Organization (WTO) 63,
153, 172
Young’s theorem 95, 97