

978-1-107-00935-6 - Socioeconomic and Environmental Impacts of Biofuels: Evidence from Developing Nations Edited by Alexandros Gasparatos and Per Stromberg Index

More information

```
secondary pollutants, 55-56, 60-62, 66
2007-2008 food crisis, 19, 21, 23, 316
                                                              sulfur dioxide, 55-57, 59-61, 284, 313
2008 economic crisis, 114, 305
abandoned land, 29, 46, 281, 286, 288, 303
                                                              Volatile Organic Compounds (VOC), 55-57, 63-67,
acidification/acid rain, 56, 60, 63, 118-119
                                                                 130, 313
advanced biofuels, 3, 68, 112, 117, 313
                                                            auctions, 125, 133, 141
African Development Bank, 264
                                                           Australia, 11, 14, 35, 37, 43-44, 74-75, 79
African Union, 273
                                                           bagasse, 8, 61, 73, 116–117, 120, 138, 256, 266–268, 270, 272, 276–277, 312
agricultural burning, 56, 59, 61, 63, 67, 118-119, 123,
     137, 142, 146, 158, 197
                                                           beef tallow, 127, 137, 141
agricultural frontier, 24, 98, 117, 159
agricultural residues, see by-products
                                                           Biodiversity Intactness Index, 286-288
agrochemicals, 14, 19, 71-73, 87, 118-119, 146,
                                                            biogas, 30, 209, 223, 268, 299
                                                            biorefinery, 57-58, 63
     196-198, 216-217, 312, 314
agroecological zoning, 38, 151-152
                                                           blending mandates, 4, 7, 9, 14, 112-113, 124-125, 132,
                                                                 136–138, 180, 206, 227, 232, 269, 276, 311, 317,
agroforestry, 202
air quality, 68, 117-118, 130, 137, 313, 321
                                                                320
Alagoas, 147, 158, 161-162, 177
                                                           Botswana, 255, 257, 259, 264
Amazon, 92, 101, 105, 107, 117, 119, 127, 137, 142,
    172-173, 176-178, 315
                                                              biodiversity impacts (of biofuels), 119, 137, 315
Angola, 140, 233, 255, 257-259, 261-264, 266, 279,
                                                              biofuel policies, 4, 14, 20, 112-114, 124-125, 137,
    288, 303
                                                                 145, 149-150, 159-160, 311, 317
Argentina, 7, 10, 13-14, 74-75, 79, 83, 93, 100
                                                              biofuel/feedstock exports, 20, 139-140, 181, 311
Armenia, 23
                                                              center-periphery relations, 165-169
Atmospheric pollutant
                                                              certification, 140, 162-165
  1-3 butadiene, 56, 66-67
                                                              drivers (of biofuel expansion), 4, 112-114, 124-125,
  acetaldehyde, 56, 65-67
                                                                 136-137, 140, 232, 274, 310
  acetone, 67
                                                              economic impacts (of biofuels), 16, 22, 120-121,
                                                                131-134, 137-138, 140-142, 315
  acrolein, 67
                                                              emissions (of biofuels), 59, 61, 63, 67-68, 116-118,
  ammonia (NH<sub>3</sub>), 55-57, 62, 313
  benzaldehyde, 67
                                                                130, 137, 313
                                                              energy provision (of biofuels), 10–11, 13, 116–117, 127–130, 137
  benzene, 56, 66-67
  black carbon, 61
                                                              energy security, 15, 136-137, 141, 310
  butylaldehyde, 67
  carbon monoxide (CO), 55-59
                                                              ethanol diplomacy, 139-140, 151, 311
                                                              feedstocks, 5-9, 114-116, 125-127, 137
  formaldehyde, 56, 65-68
  nitrogen oxides (NOx), 55-57, 63-64, 66, 130, 313
                                                              food-fuel competition, 124, 138, 316
  ozone (O<sub>3</sub>), 55-56, 63-67, 131, 313
                                                              land use change (due to biofuel expansion), 49,
  Particulate Matter (PM), 56-57, 60-62, 66, 118, 130,
                                                                92-96, 102-107, 117, 119-120, 137, 172-173,
                                                                 184, 314
  Polycyclic Aromatic Hydrocarbons (PAH), 67,
                                                              model of agricultural production, 174-179
                                                              power relations, 145, 155-158, 160-161
     118-119
  primary pollutants, 55, 57, 59, 61, 63
                                                              production modes (of biofuels), 17, 115-116, 148,
                                                                268, 270
  propionaldehyde, 67
```

978-1-107-00935-6 - Socioeconomic and Environmental Impacts of Biofuels: Evidence from Developing Nations Edited by Alexandros Gasparatos and Per Stromberg Index

More information

Brazil (cont.)	diets, 28–29, 31, 33–35, 38–41, 45, 47, 50–52, 316
scenarios of land use change, 180–186	Dominican Republic, 140
social impacts (of biofuels), 16, 19, 59, 61, 121–124,	
134–136, 138, 141, 146–147, 151–152, 310, 315	East Africa community, 273
sugarcane production in the Northeast, 153–155, 159	Ecomoz, 296
water pollution (from biofuels), 118–119, 137, 314	Economic Partnership Agreement (EPA), 259
water requirement (of biofuels), 73, 79, 83–86	ecosystem services, 198–199, 203, 319–321
Brazilian Forest code, 119	Egypt, 23, 74, 77, 79, 282
by-product	elasticity
agricultural, 8, 27, 32–33, 40–41, 50, 127, 321	ethanol demand (of), 182
biodiesel, 127	learning 133
forestry, 8	price, 178
jatropha, 223, 226, 299, 312	regional land use, 178, 181, 186
markets (for), 223, 226, 312	electricity
palm oil, 197	access, 264, 297
sugarcane, 60, 73, 116–117, 180, 256, 260, 266, 268, 271, 273, 276, 312	blackout, 254, 264, 267
271, 273, 270, 312	cogeneration, 116–117, 120, 138, 256, 260, 266–268 270–272
California, 65, 85, 232	emissions, 56, 58, 59–60
Cambodia, 18, 104	export, 260
Canada, 14, 74–75, 181	infrastructure, 264
carbon debt, 106, 117, 130, 282, 284, 313	production input (as), 128–129
cascade utilization, 50	rural electrification, 4, 18, 23
cassava ethanol	surplus, 266, 270–271
energy provision, 10, 12, 33	water requirement, 75, 77, 84–85, 87
producers, 5–6, 194, 311	Energem, 300–301
small scale production, 15, 141, 300	energy crisis, 112, 149
water consumption, 81, 83–85, 89	energy mix, 136
castor bean biodiesel	energy return on investment (EROI), 9–15, 26, 46, 116,
deforestation, 130	129, 137, 312
family farmers, 131, 135, 141	energy self sufficient villages (ESSV), 15
opportunity cost, 131	Environmental Protection Agency (EPA), 65–66, 112,
producers, 7, 137	174, 313
catalytic converters, 56, 62	epiphyte, 199–200
center-periphery relations, 146–148, 155, 165–166	equilibrium trap, 134
Cerrado, 117–119, 126, 130, 137, 142, 172–173,	Espirito Santo, 124, 177
176–178, 184–187, 315	ESV, 296–297, 299–301
certification, 138–140, 144–148, 162–170, 201, 203,	ethanol diplomacy, 139–140, 151, 311
275–276, 288, 301, 312, 318, 322	ethanol stoves, 273, 320
child labor, 121, 158	eucalyptus, 8, 289–290
China, 4–9, 11–14, 21–22, 60, 70–71, 77, 83, 85–88,	European Union (EU), 4–13, 20, 24, 74, 77, 79, 81, 83,
179, 181–182, 191–192, 205–206, 214–215,	86, 112, 139, 145, 179, 181–182, 232, 258–259,
223–225, 232, 257, 272, 310–312, 315–316, 321	265, 272, 274–275, 310
CO ₂ fertilization, 51	eutrophication, 48, 197
Coal-To-Liquid (CTL), 263, 284, 293–294 coal, 58, 60, 77, 87, 191, 276, 284, 294	Everything But Arms Initiative, 259
coconut oil biodiesel	FACT Foundation, 295–296, 299
producers, 7, 194, 311	family farmers, 112, 115, 125–126, 130–131, 134–135,
small scale production, 15	138, 140–143, 154, 164
Colombia, 11, 14, 74, 93, 140, 194	feed-in-tariffs, 271
Common Market for Eastern and Southern Africa, 273	feedstock diversification, 112, 125, 140–143, 321
competition effect, 178	ferti-irrigation, 146, 151
Condensing-Extraction-Steam-Turbines (CEST),	fertilizers, 14, 19, 21, 28, 46, 56, 58, 62–64, 66, 72–73,
270–271	87, 118, 196, 198, 211, 215, 223, 226, 243, 272,
Congo, DRC, 255, 257-260, 262-264, 266	283–285, 289, 293, 299, 312–314
coproducts, see by-products	Fischer-Tropsch process, 8, 288
corn ethanol, see maize ethanol	flex fuel vehicles (FFV), 112, 114, 118, 121, 136–137,
Costa Rica, 140	150, 180, 182, 232, 269
	food-biofuel competition
D1 plantations, 280, 293, 296, 299	cropland expansion (effects on), 36–38, 40–45
degraded lands, 119, 159, 195, 198–199, 203, 280–281,	diet (effects on), 28, 33-34, 39-42, 45
286, 288, 303–304, 314, 320	direct, 4, 9, 21, 28, 91, 135, 138, 172, 224, 268,
designer landscapes, 202–203	315–316

978-1-107-00935-6 - Socioeconomic and Environmental Impacts of Biofuels: Evidence from Developing Nations Edited by Alexandros Gasparatos and Per Stromberg Index

More information

```
food prices, 19, 21-25, 28, 181-188, 233, 241-242,
     246-248, 251, 316
  food security, 22-24, 28, 46, 48-51, 124, 138, 152,
     234, 299-300, 316, 320-321
  income effects, 17, 124, 135, 316
  indirect, 21, 23-24, 28, 71, 88, 106, 124, 219, 226,
     242-244, 248, 281, 286, 299, 303-304, 315-316,
     320, 322
  measures (against), 17, 202-203, 268-270
  poverty (impact on), 18, 22
  second generation biofuels, 8-9, 88, 192
  technology (effects on), 39-42
Food and Agricultural Research Institute (FAPRI), 106,
     174-175, 179
food deficit countries, 22-23, 50, 316
foreign exchange savings, 4, 120, 137, 265, 279, 310 foreign investment, 49, 114, 161, 167, 206, 231,
     248–249, 279, 294, 315
fossil energy improvement, 9-10, 15, 312
gasoline, 5, 20, 54–57, 59–62, 65–67, 106, 113–114,
     120-121, 136, 172, 180-182, 232, 264
general equilibrium models, 24, 247, 296
genetically modified organism (GMO), 19, 48
Germany, 14, 74-75, 83, 111, 162, 192, 232
Ghana, 22, 87, 94, 140
Green-House Gases (GHG)
  carbon dioxide (CO_2), 54–58, 101, 130, 283–284 methane (CH_4), 54–58, 66
  nitrous oxide (N2O), 54-58, 283, 313
  savings, 9, 49, 117, 130, 137, 139, 281, 284, 310,
     313, 318
Gini Index, 153
glycerine, 127
Goias, 150, 152, 173, 177
Guatemala, 18, 74-75, 83
habitat fragmentation, 196, 202, 286
Haiti, 23, 140
harvest index, 33
heat-pulse velocity sap flow monitoring, 290
high conservation value species, 198, 201-202
holdup problem, 141
Honduras, 23, 75, 83, 86, 140
hotspot
  deforestation, 94-95, 103
  biofuel, 91, 93-94, 96
  biodiversity, 119
  water, 88
housing, 123
Human Appropriation of Net Primary Production
     (HANPP), 30
Human Development Index (HDI), 15, 24, 153
human health, 54–56, 59, 61, 64–66, 118, 122, 146, 223, 226, 234, 273, 279, 313–314
hydro-power, 15, 77, 87-89, 127
India, 4-5, 7, 9, 13-14, 18-19, 21, 60-61, 70-71, 73-75,
     79, 83-84, 86, 88, 94, 115, 179, 181, 191-192,
232, 245, 258, 262, 301, 311, 314, 316, 320
Indonesia, 4, 7, 15–17, 20–21, 24–25, 59, 74–75, 79
     83-84, 86, 92-93, 95-96, 98, 103-104, 192-197,
     200, 202, 310
```

```
innovation, 120-121, 133, 137, 146, 149
integrated pest management, 200, 221
intensity
  agricultural, 36-38, 47, 51, 185-186, 202, 314,
    316
  capital, 49
  cropping, 36, 49, 70-71
  emission, 106, 232
  energy, 10, 14, 19, 116, 312
  fertilizer, 118, 196
  grazing, 31-32, 40-41, 44, 46, 183
  labor, 16, 20, 119, 122, 154, 158, 215, 218, 224, 243,
    248, 304
  water, 70, 73
International Food Policy Research Institute (IFPRI),
    246-247
invasive species, 280, 285-286, 315
irrigation, 18, 48, 70, 73-74, 85, 89, 146, 151, 159-160,
    213-216, 226, 267, 280, 282, 291-293, 303, 314
Italy, 14, 74-75, 83, 232
jatropha biodiesel
  biodiversity impact, 285-289, 315
  certification, 302
  competition with food, 21, 219, 224-226, 299-302,
    316
  coproducts, 218, 312
  deforestation, 96–97, 130, 304 drivers, 193, 206, 223, 279
  emissions, 280-284, 303
  employment generation, 214-216, 221, 224, 297,
     300-301, 303-304
  energy provision, 10, 13, 33, 46
  income generation, 19, 141, 209, 211, 213-214,
    217–218, 225–226, 245, 303–304
  invasiveness, 285-286, 315
  land tenure effects, 209, 224, 300-301
  land use change, 93, 96-97, 130, 208, 213, 226,
     281-282, 286-288, 303-304
  policies, 206, 279-280
  power relations, 19
  producers, 7, 94, 194, 206–208, 211–213, 219–222,
    279-280, 294-297
  profitability, 215-218, 225, 296-299, 303, 305, 312
  small-scale biofuel projects, 15, 18, 305
  soil erosion, 219, 304, 314
  stakeholder perceptions, 218-221, 224-225,
    299-300
  uses, 4, 7, 93, 100, 279
  water consumption, 82-85, 89, 213, 215, 289-292,
     293-294, 303-304, 314
  yield, 213, 217-220, 222-223, 280, 284, 292-293,
     295, 297-299, 301, 303-305, 321, 323
Kalimantan, 93, 197,
Kenya, 14, 140, 265, 285
Kwa-Zulu Natal, 290–292
Kyoto Protocol, 4, 199, 310
land grabbing, 18, 29, 49, 51
land sparing, 51, 202, 321
land tenure/rights, 28, 115, 123, 153, 198, 225, 227,
    249, 299, 300, 316, 320
```

978-1-107-00935-6 - Socioeconomic and Environmental Impacts of Biofuels: Evidence from Developing Nations Edited by Alexandros Gasparatos and Per Stromberg Index

More information

```
land use and cover change (LUCC), 106-107, 117, 119,
                                                          monocultures, 119, 146, 159, 196, 198, 315
                                                          Mozambique, 18, 25, 94, 140, 233, 245, 247-248, 255,
     130, 137, 142, 313-314
large plantations, 16-19, 21, 23-24, 27, 51, 64-65
                                                               257-259, 261-262, 264-266, 273, 279, 281, 292,
     91-100, 103, 113, 115-119, 122-123, 134, 146,
                                                                295-297, 299, 301-302
     155, 194-201, 203, 209, 243, 245, 280-282,
                                                          multicriteria evaluation, 318
     288-297, 300-305, 315
                                                          multilevel governance, 145, 165, 320
learning curve, 113, 133
Life Cycle Assessment (LCA), 9-10, 15, 55-61, 63, 65,
                                                          Namibia, 257, 259, 264, 278
     116-117, 127, 130, 201, 280-281, 283-284,
                                                          National Programme for the Production and Use of
     313-314
                                                                Biodiesel (PNPB), 112-113, 124-125, 127, 131,
                                                                133-135, 140-142
Madagascar, 94, 257-259, 262, 264, 288, 296
                                                          natural gas, 58, 77, 87, 89, 130, 191
maize ethanol
                                                          negotiation power, 18-19
  competition with food, 21, 124
                                                          Nepal, 12, 15, 18
                                                          Net Primary Production (NPP), 30-32, 47
  competitiveness, 139
  emissions, 57-63, 65, 106, 313
                                                          Netherlands, 11, 13, 74-75, 84-85, 192
  energy provision, 10-11, 33, 46
                                                          Nicaragua, 23, 75, 83, 140
  land use change, 106, 173, 178, 182-184, 186-187
                                                          Nigeria, 23, 74, 79
  price, 22, 185
                                                          nuclear power, 87
  producers, 5, 179, 265
  water consumption, 74-75, 79-86, 89
                                                          oil crisis, see energy crisis
Malawi, 233, 257-259, 261-266, 294
                                                          open cast mining, 288, 294
Malaysia, 7, 10, 16, 75, 83, 86, 92-93, 95, 97-99, 103,
                                                          opportunity cost, 20, 26, 131, 140, 199, 225, 304-305
     192-196, 201, 310
                                                          organic agriculture, 34, 36, 41, 47, 50
Mali, 18, 233
                                                          Organisation for Economic Cooperation and
malnutrition, 28, 246
                                                               Development (OECD), 5-7, 232-234, 236,
Maranhao, 173, 177
                                                                246-247, 250, 274
marginal lands, 37, 49, 149, 195, 280–281, 299–300
                                                          Oval plantations, 295
markets
                                                          Pakistan, 20, 70-71, 74-75, 79, 192
  access (to), 17, 19
  carbon markets, 199
                                                          palm oil biodiesel
  coproduct markets, 220, 222, 226, 271-272, 277, 312
                                                             biodiversity impacts, 194-196, 198-201, 203,
  international markets, 9, 19-20, 113, 132, 137,
                                                               315
     139–140, 142, 159, 172, 174, 179, 233, 248, 250,
                                                             certification, 201, 317
                                                             competition with food, 21, 202
     258–259, 265, 274–275, 279, 311–312
  market mediated effects, 57, 234-236, 249, 251
                                                             deforestation, 92, 95-96, 98-99, 196, 203
  national markets, 22, 70, 112, 114, 121, 125, 135,
                                                             degraded lands (from), 198
     150, 154, 160, 167, 179, 182, 206–208, 218–219,
                                                             drivers, 192-193
     269, 272-273, 295, 304, 322
                                                             emissions, 64-66, 92, 284
  preferential markets, 258-260, 265, 268-269
                                                             employment generation, 16
  regional markets, 258, 269, 273-274, 312, 322
                                                             energy provision, 10, 13, 33, 46, 141
  risks, 20
                                                             habitat loss, 196
  uncertainty, 19, 134, 218-219, 226
                                                             income generation, 16
                                                             land use change, 92, 130, 196–197, 201-202
  volatility, 19, 172, 245, 254, 264
Marli Investment plantations, 295
                                                             producers, 7, 93, 127, 135, 137, 192, 194, 202,
Mato Grosso, 92-93, 101-102, 107, 173, 177
                                                               280-281
Mato Grosso do Sul, 123, 150, 152, 173, 177
                                                             small scale biofuel projects, 15
Mauritius, 257-260, 262, 265-266, 273
                                                             soil erosion, 196-197, 314
mechanization, 16, 24, 122–123, 135, 138, 142, 146, 154, 159, 298, 305, 315, 321
                                                             uses, 100
                                                             water consumption, 21, 82-84, 86, 89
Mexico, 11, 74, 79, 93-96
                                                             water pollution, 196-197
                                                          Paraguay, 14, 75
                                                          Parana, 162, 173, 177
  jatropha, 223
  sugarcane, 73, 113-117, 123, 146, 150, 153-155,
                                                          partial equilibrium model, 24, 174-179
     158, 160–162, 167, 262, 266–267, 269–271
                                                          payment for ecosystem services, 198-199
  palm oil, 19, 197
                                                          percent fossil energy improvement, 9-10, 15
Millennium Development Goals (MDG), 263
                                                          Pernambuco, 147, 149, 153-154, 157-158, 160, 167
Millennium Ecosystem Assessment (MA), 36
                                                          Peru, 14-74
Minas Gerais, 93-94, 122, 124, 150, 152, 173, 177
                                                          pesticides, see agrochemicals
miombo woodlands, 281-284, 288, 304
                                                          Petrobras, 113-114, 125, 134, 140, 160
molasses, 6, 12, 15, 21, 256, 260, 265, 269–270, 273,
                                                          Petrochina, 211, 221, 224-227
    275
                                                          Philippines, 16, 74-75, 79, 83, 86, 192-194, 310
                                                          Piaui, 173, 177
Mongolia, 23
```

978-1-107-00935-6 - Socioeconomic and Environmental Impacts of Biofuels: Evidence from Developing Nations Edited by Alexandros Gasparatos and Per Stromberg Index

More information

Index 373

poverty, 15-20, 22-23, 25, 48, 50, 122-126, 134-135, salinization, 48-49 138, 146, 153, 155–156, 159–161, 164, 166, 170, solar energy, 77, 87, 206 191, 223, 247, 250, 263, 272, 296, 299-301, 303, South Africa, 14, 18, 60, 71, 74, 86, 245, 255, 257-258, 310, 316, 321-322 260, 262-266, 269, 272-273, 279-280, 282, 284-289, 291-294, 298, 303, 316 power relations, 144-145, 147-149, 155, 157-158, 163-170, 321-322 South Korea, 14, 139, 179, 181 precautionary principle, 286, 323 South African Custom Union (SACU), 259 southern Africa, see Southern African Development Proalcool, 4, 112-113, 120, 133, 141, 149, 149, 156, Community (SADC) 160 Prokon, 295 Southern African Development Community (SADC) purchasing power, 50, 122, 241-242 bioenergy potential, 260-262 bioenergy use, 255 biofuel drivers, 263-265, 279 radiative forcing, 61 biofuel energy provision, 11–13 biofuel policies, 14, 268–270, 279–280 rapeseed biodiesel energy provision, 10, 13, 33, 46, 192 emissions, 284 biofuel project typology, 294-296 land use change, 182, 186 biomass resources, 257 producers, 7 certification, 275-276, 302 water consumption, 75, 82-86, 89 electricity cogeneration, 266-268, 270-271 Reducing Emissions from Deforestation and Forest international biofuel trade, 274-275 Degradation (REDD), 199 jatropha biodiversity impacts, 286-289, 315 jatropha emissions, 281-284 reed canary, 8 regression analysis, 131-133 jatropha invasiveness, 285-286 regulatory initiatives, 317 jatropha profitability, 296-299 remote sensing, 96-99, 104, 260, 318 jatropha water requirement, 289-294 jatropha yield, 292-293, 301 Renewable Energy Directive (EU RED), 162, 276, 279, 317 land tenure, 300-302 Renewable Energy Law, 205–206 Renewable Fuel Standard, 174, 182, 232 oil imports/dependency, 263-264 regional biofuel trade, 272-274 Rio de Janeiro, 67, 148, 177 regional land use, 257 Rio Grande do Sul, 134, 177 sugar markets, 258-260, 271-272 riparian buffer zones, 119, 201 sugarcane co-products, 271-272, 312 Roundtable of Sustainable Palm Oil (RSPO), 92, 201, sugarcane ethanol, 265-266 317 sugarcane potential, 260-263 Roundtable on Sustainable Biofuels (RSB), 92, 201, sugarcane production, 257-258, 271-272 302 317 soybean biodiesel Roundtable on Sustainable Soy (RTRS), 92, 317 biodiversity impacts, 196, 315 Rwanda, 22 certification, 92, 317 competition with food, 21, 138 deforestation, 92, 98–99, 102–103 drivers, 112–113, 124–125, 137, 140–141 Sabah, 93, 96-99, 201 Santa Fe, 93 emissions, 58, 130, 137, 284, 313 Sao Paulo, 17, 22, 73, 93, 107, 113-115, 117-124, 130, employment generation, 134-135, 138, 142 136–137, 142, 146–157, 159, 161–163, 166, 173, 177 energy provision, 10, 13, 33, 46, 127-130, 137 savanna, 130, 281-284 habitat loss, 196 short rotation coppice, 8, 32 income generation, 134-135, 138, 142 slave labor, 119, 121–122, 146, 148, 152, 155–156, 158, land use change, 92, 107, 130-131, 137, 173, 178, 182, 184, 186–187, 315 168 learning curve, 132-134 small-scale biofuel projects, 15, 18, 23, 25, 160, 295–296, 315, 321, 323 smallholders, 17–19, 22–23, 26, 48–49, 51, 134, 141, policies, 112-113, 124-125, 137, 140-141 producers, 7, 92–93, 125–127, 131–132, 137 152, 160, 164, 238, 245, 248, 294-295, 297, small-scale biofuel projects, 18 300-301, 304-305, 315 uses, 21, 91 social inclusion, 125, 134, 138, 168, 310 Social Seal, 125, 131–132, 137, 142 water consumption, 82-85, 89 Spain, 14, 74 sub-Sahara Africa bioenergy potential, 45, 233, 255 degradation, 37, 47-49, 119, 159, 196 emissions (from), 66 bioenergy use, 255 erosion, 196-197, 304, 314 biofuel drivers, 4, 233, 248, 254, 310 fertility, 28, 32, 221, 314 biofuel emissions, 61 moisture, 72, 209, 290-291 biofuel impacts on households, 235 biofuel land expansion, 42 organic matter, 281-282, 284 protection, 29 biofuel policies, 6, 9, 14, 321-322

978-1-107-00935-6 - Socioeconomic and Environmental Impacts of Biofuels: Evidence from Developing Nations Edited by Alexandros Gasparatos and Per Stromberg Index

More information

```
sub-Sahara Africa (cont.)
                                                            Swaziland, 257-260, 262, 264-266, 280, 293
  biofuel trade impacts, 233, 246
                                                            Sweden, 14
  crop yields, 48
                                                            sweet potato ethanol
  cropland, 37, 42-44, 48, 51
                                                              energy provision, 12
  deforestation, 103-104
                                                              producers, 6
  food prices/security, 22-23, 246-247
                                                              water consumption, 83
  household resource allocation, 243-246
                                                            sweet sorghum ethanol
                                                              energy provision, 10, 12, 46
  household typology, 234-241
  innovation, 28, 35
                                                              producers, 5-6, 270
  jatropha, 4, 94, 96
                                                              water consumption, 83
  land acquisitions, 249
                                                            Switzerland, 10-11
  land grabbing, 49
  palm oil, 194
                                                            Tanzania, 94, 245, 248, 251, 255, 257-259, 261-262,
                                                                 264, 266, 273, 279, 281, 295–297
  second generation biofuels, 9
                                                            tariff barriers, 50, 139, 179, 232, 259, 275, 311
  small-scale biofuel projects, 15, 18, 309
  sugarcane ethanol, 140, 310, 312
                                                            TerraRossa plantations, 288, 296
  water availability, 71
                                                            Thailand, 12-14, 18, 64-66, 74-75, 83, 86, 192-195,
subsidies, 14, 20-21, 112-114, 132, 138, 142, 149-150,
                                                                310
     156, 160-161, 194, 211, 219-222, 224-226, 233,
                                                            tillage, 58, 313
                                                            Tocantin, 130, 173, 177
subsistence farming, 23, 48–51, 134, 155, 157, 201, 219, 223, 257, 277, 281, 299–301
                                                            Total Primary Energy Supply (TPES), 255
                                                            trade barriers, 20, 275
Sugar and Alcohol Institute, 114, 158
                                                            trade unions, 121, 123, 155-157, 167
Sugar Protocol, 259
                                                            transaction cost, 17, 19, 134, 141
sugarbeet ethanol
                                                            transesterification, 3, 7, 10, 127
  emissions, 60
  energy provision, 10, 12, 33, 46
                                                            Uganda, 18
                                                            United Kingdom, 11-14, 74-75, 206, 317
  land use change, 182, 186
  producers, 5
                                                            United Kingdom Renewable Transport Obligation
  water consumption, 74-77, 79, 81, 83-86, 89
                                                                 (RTFO), 302, 317
                                                            United States, 4-10, 13-14, 22, 24, 55, 59-61, 65,
sugarcane ethanol
  as agent of innovation, 121, 137
                                                                67-68, 74-75, 77, 79, 81, 83-86, 106, 112, 131,
                                                                 139, 172, 179, 181–183, 185, 191, 206, 232, 257,
  biodiversity impacts, 119, 196, 315
  certification, 140, 162-165, 275-276
                                                                259, 275, 311
  competition with food, 21-22, 100-101, 124, 138,
                                                            urban
                                                              emissions, 61-62, 64-65, 67, 117-118, 130
    316
                                                              households, 207, 233, 235-237, 241, 247-248, 250
  deforestation, 92, 98, 137
  drivers, 112, 137, 256, 310-311
                                                              land use, 37–38, 43–44, 198, 273
  emissions, 59-61, 63, 65, 67, 117-118, 137, 146,
                                                              migration, 123-124, 224
                                                              poverty, 23, 316
  employment, 16, 121-123, 138, 316, 321
                                                              water demand, 71
  energy provision, 10–11, 15, 33, 46, 116–117, 120, 127, 136–137, 312
                                                            utility maximization, 237-240
  income generation, 17, 122, 124, 138, 316
                                                            Via Campesina, 299
  international market, 138-140, 181, 272-275
                                                            voluntary standards, 162, 302, 317-318, 320
  labor standards, 121-123, 138, 146, 155, 158, 316
  land tenure, 129-124, 136, 146, 316
                                                            water footprint
  land use change, 92, 98, 107, 117, 119, 137, 172,
                                                              barley ethanol, 81, 83-86, 89
                                                              biomass heat/electricity, 84-85
     182-186, 265
  policies, 112-114, 265, 268-270
                                                              cassava ethanol, 81, 83-85, 89
  producers, 5, 93, 114–115, 137, 147–155, 158–160,
                                                              coal, 77, 87
     173, 181, 194
                                                              definition, 70, 72-73
  small-scale biofuel projects, 15
                                                              hydropower, 77, 87-89
  social conflicts, 155-158
                                                              jatropha biodiesel, 82-85, 89, 293, 314
  water consumption, 73, 78-79, 81, 83-86, 88-89
                                                              maize ethanol, 79-86, 89
  water pollution, 118-119, 137, 146, 314
                                                              natural gas, 77, 87, 89
SUN plantations, 296, 300
                                                              nuclear energy, 87
sunflower seed biodiesel
                                                              oil, 77, 87
  energy provision, 10, 13
                                                              palm oil biodiesel, 82-84, 86, 89
  land use change, 182, 186
                                                              rapeseed biodiesel, 82-86, 89
  producers, 7, 18, 137
                                                              rice ethanol, 81, 83-84, 89
  water consumption, 82-84, 86
                                                              rye ethanol, 81, 83, 89
sustainability science, 319, 321
                                                              solar energy, 77, 87
```



978-1-107-00935-6 - Socioeconomic and Environmental Impacts of Biofuels: Evidence from Developing Nations Edited by Alexandros Gasparatos and Per Stromberg Index

More information

Index 375

World Trade Organisation (WTO), 275-276

soybean biodiesel, 82-85, 89 $sugarbeet\ ethanol,\ 76-77,\ 79,\ 81,\ 83-86,\ 89$ sugarcane ethanol, 73, 78-79, 81, 83-86, sweet potato ethanol, 81, 83-84, 89 sweet sorghum ethanol, 81, 83-84, 89 wheat ethanol, 81, 83-84, 86 wind energy, 77, 87-88 weed cover, 199 West African Monetary Union, 233 wheat ethanol competition with food, 21 energy provision, 10-11, 33, 46 land use change, 173, 182, 184, 186–187 producers, 5, 179 water consumption, 74-75, 81, 83-84, 86 wild-life friendly farming, 202, 321 wind power, 15, 77, 87, 206 wood charcoal, 255, 273 World Bank, 102, 247, 263

Yunnan province
fuel-food competition, 224–226
jatropha area, 206, 208–211, 213, 226
jatropha coproducts, 218
jatropha employment generation, 221, 224
jatropha income generation, 213–214, 217–218, 225–226
jatropha production modes, 211
jatropha profitability, 215–218
jatropha yields, 213, 217–220, 222–223
jatropha-producing households, 207–208, 211–213
production inputs, 213–216
soil erosion, 219
stakeholder perceptions, 218–221, 224–225

Zambia, 14, 19, 94, 255, 257–259, 261–266, 269, 273, 279, 282, 294–296, 298
Zimbabwe, 75, 255, 257–259, 261–262, 264–267, 269