



## Integrating sustainable development into the Fourth Assessment Report of the Intergovernmental Panel on Climate Change

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### Abstract

This paper reviews how sustainable development was treated in prior assessment reports of the Intergovernmental Panel on Climate Change (IPCC) and presents proposals on how it might be integrated into the forthcoming Fourth Assessment Report (AR4). There has been a steady, but slow, increase in the exposure and treatment of sustainable development in each subsequent IPCC assessment. However, much more remains to be done if the mandate provided in the United Nations Framework Convention on Climate Change (UNFCCC) is to be met. The paper argues that the AR4 can take three practical steps in making the integration more complete. First, at the conceptual level, equity concerns should be made a more pervasive, even central, focus of the AR4. Second, at the analytical level, the examination of alternative development pathways begun during the TAR process needs to be continued and expanded. Third, at the operational level, the AR4 should deal with sustainable development in all its chapters rather than relegating it to a peripheral few, should broaden the base of expertise reflected in its panels of authors and reviewers, and should commission a companion special report on climate change and sustainable development.

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### 1. The IPCC and sustainable development

Created in 1988 to “assess the scientific, technical and socio-economic information relevant for the understanding of the risk of human-induced climate change,” the Intergovernmental Panel on Climate Change (IPCC) has gradually inched towards acknowledging and exploring the inter-linkages between climate change and sustainable development. Like the larger climate change policy regime, of which it

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31 is a part, the IPCC's internalization of these linkages has been rather halting and remains incomplete  
32 (see Parikh, 1992; Parikh et al., 1997; Sagar and Kandlikar, 1997; Agarwala, 1998; Najam and Page,  
33 1998; Agarwal et al., 1999; Jamieson, 2001; Najam et al., 2003). However, it should be acknowledged  
34 that the IPCC has steadily, even if slowly, increased its exposure to sustainable development concerns  
35 (Banuri et al., 2001; Munasinghe, 2001). Most notably, its most recent assessment report concluded  
36 that “approaches that exploit synergies between environmental policies and key national socio-economic  
37 objectives like growth and equity could help mitigate and reduce vulnerability to climate change, as well  
38 as promote sustainable development” (Watson, 2001: p. 132).

39 The links between sustainable development and climate change are deep, multiple and varied (see,  
40 Cohen et al., 1998; Rayner and Malone, 1998; Banuri and Gupta, 2000; Munasinghe, 2000; Robinson  
41 and Herbert, 2001). The policy mandate to deal with climate change within the context of sustainable  
42 development—as a right and as an obligation—was articulated as early as 1992 in the United Nations  
43 Framework Convention on Climate Change (UNFCCC) and then re-affirmed in the 1997 Kyoto Protocol  
44 (Moomaw et al., 1999; Najam, 2000). However, the larger literature has only recently begun exploring  
45 these issues in earnest. Arguably, this belated recognition is itself an indirect output of the IPCC process. It  
46 is an emerging literature that has been propelled by, on the one hand, developing country policymakers and  
47 scholars persistently demanding that the sustainable development context of climate policy be explored  
48 within IPCC reports and, on the other hand, finding that the broader scholarship (which is the basis of  
49 such reports) has been mostly negligent of such concerns. The literature that has now begun to emerge as  
50 a result of this felt need and recognized void is largely driven by IPCC experts, particularly by developing  
51 country scholars who have been making the case for such linkage most strongly (e.g. Rahman, 1997;  
52 Najam and Sagar, 1998; Sagar and Banuri, 1999; Sokona et al., 1999; Shukla, 1999; Munasinghe, 2000;  
53 Huq and Sokona, 2001; Beg et al., 2002; Ravindranath and Sathaye, 2002).

54 Over the last decade and a half, the IPCC has stumbled towards progressively greater inclusion of  
55 sustainable development concerns. Although this evolution has been in step with the evolution of the  
56 greater literature it has continued to lag behind the policy mandate articulated in the UNFCCC. The  
57 Third Assessment Report (TAR) went the furthest by first acknowledging that “the attention accorded  
58 in the UNFCCC to sustainable development . . . [had not] been matched by its treatment in previous  
59 IPCC assessment reports” and then seeking to “address this mismatch by placing policy evaluation in  
60 the broader context of development, equity, and sustainability as outlined in the Convention” (Banuri  
61 et al., 2001: p. 77; also see Smit et al., 2001; Watson, 2002). While it can be argued that sustainable  
62 development concerns are still peripheral to the central thrust of the TAR and were unevenly integrated  
63 into it, the fact remains that the TAR was an important step forward in the IPCC's ongoing quest to ‘catch  
64 up’ with sustainable development (see Swart, Robinson and Cohen, this volume; Munasinghe, 2001).

65 Fig. 1, based on the TAR, highlights how the range and scope of the policy analysis tools used by  
66 the IPCC have expanded over its three assessment reports and how each expansion has brought it closer  
67 to a relatively deeper treatment of sustainable development.<sup>1</sup> The central questions motivating the First  
68 Assessment Report (FAR) were those related to climate and climatic impacts: what is the extent of  
69 anthropogenic interference in global climate systems and what are the likely impacts of such interference?

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<sup>1</sup> In explaining the original diagram, the TAR points out that “there is no presumption that any particular framework for analysis is most important at any level. . . . In practice, the literature has expanded to add new issues and has subsumed rather than discarded the analyses of the initial issues. With each assessment, the IPCC has added to the necessary tool set without alleviating the need for the tools developed in the earlier assessments” (Banuri et al., 2001: p. 78).

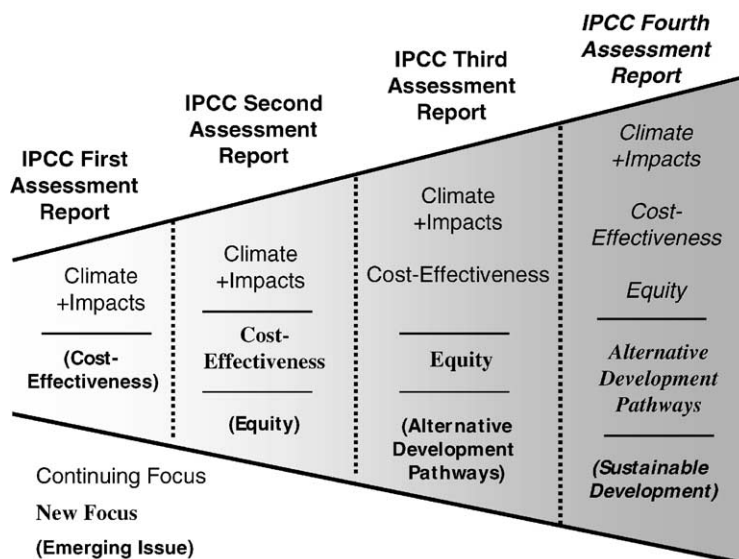


Fig. 1. Evolution of the IPCC assessment process (based on Banuri et al., 2001: p. 78).

70 These have remained, and will remain, a central preoccupation of IPCC enquiries. At the same time, the  
 71 FAR also began raising a set of emerging questions related to what might be done about global climate  
 72 change and the cost-effectiveness of potential policies. These questions gained more prominence as a  
 73 new focus area in the Second Assessment Report (SAR). However, the SAR further broadened the IPCC  
 74 policy discourse by introducing the issue of equity into the IPCC mix. By the Third Assessment Report,  
 75 climate impacts as well as cost-effectiveness were both firmly established as continuing focus areas of  
 76 the IPCC while questions about equity, which had only begun to be raised in the SAR, began gaining a  
 77 little more prominence as a new focus of the assessment process. In addition, the TAR contributed to the  
 78 evolutionary broadening of the IPCC process by introducing discussions about alternative development  
 79 pathways and global sustainability (especially through its emphasis on scenarios) into the IPCC mix.

80 Projecting forward the trends exhibited in the evolution of the first three IPCC assessments suggests  
 81 that the upcoming AR4 could present an important opportunity to meaningfully integrate sustainable  
 82 development into the IPCC assessment process.<sup>2</sup> The next section will argue that the AR4 is particularly  
 83 well-positioned to make sustainable development one of its conceptual and organizing frameworks. This  
 84 is followed by a discussion of how such an integration could be practically operationalized within the  
 85 context of the AR4.

## 86 2. The AR4 and sustainable development

87 The case for why IPCC assessments should engage sustainable development more comprehensively has  
 88 been made often, including by the IPCC itself, and is usually composed of two strands; one substantive

<sup>2</sup> The right-most column of Fig. 1 is italicized to signify that entries here are proposed projections.

89 and one institutional (see, for example, Cohen et al., 1998; Banuri et al., 2001; Munasinghe, 2000; Smit  
90 et al., 2001; Robinson and Herbert, 2001). The substantive argument maintains that although climate  
91 policy cannot be a substitute for sustainable development policy, the goals of the two are synergistic,  
92 i.e. that the realization of sustainable development can be both a framework condition and a motor for  
93 the better implementation of climate policy. The institutional argument relates to the stated intent of the  
94 UNFCCC, Kyoto Protocol, and IPCC deliberations, i.e. that IPCC assessments are mandated to integrate  
95 sustainable development concerns.

96 The case for integration is by now well-rehearsed, generally accepted, and no longer in need of  
97 reaffirmation.<sup>3</sup> The intellectual challenge is no longer to argue for the desirability of making the link,  
98 but to demonstrate its practicability. It is our contention that while integration remains as desirable as  
99 ever, the conceptual evolution of the IPCC assessment process (as described in Fig. 1) has made it more  
100 practicable for the AR4 to do so. However, three key conditions would need to be met if this potential is  
101 to be realized:

- 102 ● First, at the conceptual level, the trend exhibited in previous IPCC assessments has to be maintained  
103 and equity concerns—which appeared as an emerging issue in the SAR and gained slightly more  
104 prominence in the TAR—must be made a more pervasive, even central, focus of the AR4.
- 105 ● Second, at the analytical level, the examination of alternative development pathways begun during the  
106 TAR process, needs to be continued and expanded into the AR4.
- 107 ● Third, at the operational level, the country delegates as well as experts of the IPCC have to match their  
108 eloquent rhetoric with a demonstrated will to make sustainable development a central component of  
109 IPCC's overarching assessment framework.

110 We will now discuss each of these three conditions in terms of their importance and practicability in  
111 the context of the AR4.

### 112 3. Expanding the focus on equity

113 By devoting an entire chapter (in the report of the working group on impacts, adaptation and mitigation)  
114 to 'equity and social considerations' (Banuri et al., 1996), the SAR introduced the importance of equity  
115 concerns—both procedural and consequential equity—to the IPCC assessment process. The TAR process  
116 sought to further advance the issue and integrate equity, and thereby sustainable development, more deeply  
117 into the IPCC framework by developing a 'guidance paper' on development, equity and sustainability  
118 (Munasinghe, 2000) and by organizing a set of expert meetings on related aspects (Munasinghe and  
119 Swart, 2000; Pichs-Madruga, 2001). While the treatment of equity concerns was less than consistent in  
120 the TAR, it was nonetheless an improvement on its predecessor.

121 The challenge before the AR4 is to take this process to the next step and make equity a central conceptual  
122 lens through which all chapters view the climate change problematique. As we will discuss later, simply

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<sup>3</sup> Of course, some are likely to continue resisting a deep integration of sustainable development concerns out of the fear that such a broadening of the agenda could dilute or distract attention from narrower and more precise climate concerns. Such reasoning is flawed mostly because it views the relationship between sustainable development and climate policy to be a zero sum game; where the importance invested in one can only come at the expense of the focus on the other. As is amply demonstrated by the other papers in this special issue, the relationship tends to be complimentary—even synergistic—rather than competitive.

123 relegating equity discussions to one, or even a few, chapters will no longer be enough. Indeed, the test  
124 and yardstick should be that equity metrics are consistently utilized throughout the AR4 in much the  
125 same way as, for example, cost-effectiveness concerns were central throughout the TAR. For example,  
126 just as the TAR made important headway by not only discussing climate impacts but also reviewing the  
127 relative cost-effectiveness of various policy measures and options, the AR4 should (in addition to this) also  
128 review how equitable various policy measures and options might be. Just as cost-effectiveness discussions  
129 gained in prominence through the first two assessments to become a key conceptual lens for the TAR,  
130 equity—whose importance has been acknowledged in the last two IPCC assessments—is now ready to  
131 take its rightful place as an additional conceptual lens for the fourth and future assessments. Bringing the  
132 treatment of equity discussions at par with cost-effectiveness must not, however, be seen as a decrease in the  
133 importance of the latter. Indeed, the two are complimentary goals: good policy must be both cost-effective  
134 and equitable, or represent a judicious balance of the two. Moreover, following IPCC tradition and  
135 mandate, both can, and should, be treated in a policy-relevant, rather than a policy-prescriptive, manner.  
136 The discussion on equity need not be seen as being any more or any less ‘prescriptive’ than similar  
137 discussions of cost-effectiveness; neither is any more or less ‘value driven’ than the other. Both are  
138 empirical, testable and measurable concepts, even though there is considerable debate on what the best  
139 way to measure either is. Even though particular ideological persuasions might sometimes consider one  
140 or the other suspect, the broader scholarship accepts both as prerequisites for good public policy, and the  
141 IPCC should also treat both as equally important.

142 Importantly, expanding the focus on equity is a necessary precondition for the meaningful integration  
143 of sustainable development. There is general agreement that sustainable development is best envisioned  
144 as having three essential elements: environmental, social and economic (Lélé, 1991; Munasinghe, 1992,  
145 2002; Opschoor, 1992; Banuri et al., 1994; Najam and Cutler, 2003). A version of the now familiar triangle  
146 that puts the three elements together is presented in Fig. 2, which additionally highlights how each man-  
147 ifests itself within evolving global climate change debates: the environmental dimension of sustainable  
148 development is best reflected in climate change debates through their focus on climate variability and im-  
149 pacts; the economic dimension is encapsulated most potently in discussions related to cost-effectiveness;  
150 and the social dimension is best captured through a focus on equity.

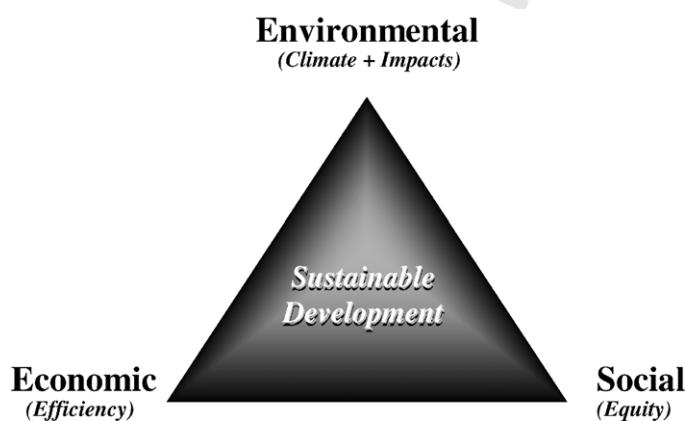


Fig. 2. The elements of sustainable development in the context of global climate change policy.

151 In relating the scheme depicted in Fig. 2 to the evolution of the IPCC assessment process shown  
152 in Fig. 1, it is evident that while the environmental and economic dimensions have been the focus of  
153 IPCC assessments to date, the social dimension remains under-represented. Sustainable development  
154 cannot be fully integrated into the IPCC assessment regime until all three dimensions are equally and  
155 centrally brought into focus. A more comprehensive and consistent treatment of equity metrics in the  
156 AR4 would allow all three dimensions to be incorporated and is, therefore, a necessary condition for the  
157 more meaningful integration of sustainable development.

#### 158 4. Analyzing alternative development pathways

159 One of the more important conclusions of the TAR (Morita et al., 2001), and of the IPCC Special Report  
160 of Emissions Scenarios (SRES) before it (Nakicenovic and Swart, 2000), was that the ultimate goal of  
161 stratospheric greenhouse gas (GHG) stabilization is dependent on socio-economic choices as much as on  
162 climate policy. This finding is profound because it suggests that the development pathways that societies  
163 choose today may be as important, possibly even more important, as the climate measure they take. To  
164 put it starkly, this means that the analysis of alternative development pathways for the future is as central  
165 to the achievement of greenhouse stabilization as the analysis of climate measures. The AR4 has the  
166 opportunity to rise to this challenge in at least three important ways.

167 First, it is already likely that adaptation issues—particularly in developing countries—will become an  
168 important area of focus in the AR4. This provides an opportunity to elevate the attention invested in devel-  
169 oping country concerns, the need for envisioning alternative development pathways, and the sustainable  
170 development framework. Developing countries, which tend to be more vulnerable to the impacts of cli-  
171 mate change, will particularly benefit from analyses of alternative development pathways which enhance  
172 their adaptive capacities, build greater resilience to climate change, and generally create conditions for  
173 sustainable development (see Burton et al., 2002; Adger et al., in press). It is important, however, that  
174 the new focus on adaptation not distract from a continuing focus on mitigation, particularly in industri-  
175 alized countries. Indeed, the UNFCCC goal of GHG stabilization cannot be achieved without significant  
176 mitigation measures by the major emitter countries. Moreover, much like sustainable development itself,  
177 both mitigation and adaptation are the responsibility of all countries; developing as well as industrialized.

178 Second, the AR4 has the opportunity to maintain and extend the momentum on the analysis of alternative  
179 development pathways that was generated by the SRES and the TAR. For this potential to be realized, the  
180 next generation of climate scenarios would need to broaden their scope, they would need to be based on  
181 the varied conditions of different regions, and they would need to pay even greater attention to the social  
182 dimension of the sustainable development triangle (see Swart, Robinson and Cohen, this volume). This  
183 will be a difficult and long-term enterprise, which might not be completed in the timeframe of the AR4.  
184 However, it should begin now so that it can influence the process of this assessment and the substance of  
185 future assessments.

186 Finally, there is an opportunity in the AR4 to expand on the work initiated in the TAR to consolidate  
187 learning on decision-making frameworks for sustainable development at the national and local levels (see  
188 Toth et al., 2001). Sustainable development decisions are most often made at local levels, and global  
189 climate change policy has much to understand in exactly where, how and why these decisions are made  
190 and how they can be influenced to yield better climate results—this is as true for local decisions and  
191 decision frameworks in all countries, industrialized as well as developing.

## 192 5. Integrating sustainable development

193 Although acknowledging the conceptual centrality of equity concerns and investing in an expanded  
194 analysis of alternative development pathways are both necessary conditions for integrating sustainable  
195 development into the IPCC assessment process in a more meaningful way, they will fall short of the  
196 challenge unless some more mundane operational steps are also taken. Three such steps are particularly  
197 important for the the AR4 process:

- 198 • First, in relation to the structure of future assessment reports, the treatment of sustainable develop-  
199 ment in any IPCC assessment will remain incomplete and largely ineffective unless it is undertaken  
200 consistently throughout the assessment. As suggested earlier, it is no longer enough to relegate sus-  
201 tainable development (or its component concerns, like equity) to a few chapters on the periphery of  
202 the main assessment. The AR4 process has already designated sustainable development as one of its  
203 many ‘cross-cutting’ themes. This designation, while welcome, will be meaningful only if all relevant  
204 chapters deal with related aspects of sustainable development. Practically, this would require all author  
205 teams to include a few experts who can speak directly to the linkage between climate change and  
206 sustainable development in the context of that chapter.
- 207 • Second, in terms of the composition of the assessment teams, there is a need to continue broadening the  
208 base of expertise and scholarship reflected in the panels of authors and reviewers of the IPCC reports.  
209 The TAR had taken some welcome steps in this direction by including more developing country  
210 experts on these panels than its predecessor reports and also by including more social scientists. A  
211 deeper integration of sustainable development concerns would not only require a broadening of the  
212 substantive focus, but a concomitant deepening of the geographic and disciplinary diversity reflected in  
213 the assessment teams. Given the practical limitations of the number of individuals who can be involved  
214 in such a consultative enterprise, it is vital that no country—industrialized or developing—dominate  
215 the process disproportionately.
- 216 • Finally, in relation to the larger assessment process, the integration of sustainable development into  
217 the AR4 process should be jump-started by commissioning a special report on climate change and  
218 sustainable development. The experience of various other IPCC special reports suggests that this  
219 would jump start the process of integration, would facilitate deeper and earlier interaction between  
220 those most directly involved in research on sustainable development and climate change issues and  
221 those researching other aspects of climate change, would encourage new research on the subject,  
222 and would enable the involvement of a larger pool of sustainable development experts than could be  
223 accommodated in the AR4 itself.<sup>4</sup> Designating sustainable development as a cross-cutting theme for  
224 the AR4, while welcome, is not a substitute for a special report because it does not serve to mobilize  
225 the type of intellectual resources or generate the level of international debate and attention that the  
226 latter could.

227 To conclude, we are of the opinion that the AR4 provides an important opportunity for integrating  
228 sustainable development into the IPCC assessment process. Such integration must happen at the con-  
229 ceptual level with an expansion of the focus on equity concerns, at the analytical level with greater  
230 investment in the examination of alternative development pathways, and at the operational level by care-  
231 fully designing the structure, the team and the process of the assessment to facilitate such integration.

<sup>4</sup> Various unsuccessful attempts have been made to commission such a report.

232 We do not contend that doing so is going to be easy; we do believe that it is possible, and certainly  
 233 desirable.

#### 234 **Uncited references**

235 Metz et al. (2001), Najam and Cleveland (in press).

#### 236 **References**

- 237 Adger, W.N., Huq, S., Brown, K., Conway, D., Hulme, M. Adaptation to Climate Change in the Developing World, Progress in  
 238 Development Studies, in press.
- 239 Agarwal, A., Narain, S., Sharma, A. (Eds.), 1999. Green Politics: Global Environmental Negotiation-1: Green Politics. Centre  
 240 for Science and Environment, New Delhi.
- 241 Agarwala, S., 1998. Context and early origins of the intergovernmental panel on climate change. *Climatic Change* 39 (4),  
 242 605–620.
- 243 Banuri, T., Gupta, S., 2000. The Clean Development Mechanism and Sustainable Development: An Economic Analysis. Asian  
 244 Development Bank, Manila.
- 245 Banuri, T., Hyden, G., Juma, C., Rivera, M., 1994. Sustainable Human Development: From Concept to Operation. United Nations  
 246 Development Programme, New York.
- 247 Banuri, T., Goran-Maler, K., Grubb, M., Jacobson, H.K., Yamin, F., 1996. Equity and Social Considerations. *Climate Change*  
 248 1995: Impacts, Adaptations and Mitigation of Climate Change: Scientific-Technical Analyses. Cambridge University Press,  
 249 Cambridge.
- 250 Banuri, T., Weyant, J., Akumu, G., Najam, A., Roas, L.P., Rayner, S., Sachs, W., Sharma, R., Yohe, G., 2001. Setting the Stage:  
 251 Climate Change and Sustainable Development, pp. 73–114 (Metz et al., 2001).
- 252 Beg, N., Marlot, J.C., Davidson, O., Afrane-Okesse, Y., Tyani, L., Denton, F., Sokona, Y., Thomas, J.P., la Rivere, E.L., Parikh,  
 253 J.K., Rahman, A.A., 2002. Linkages between climate change and sustainable development. *Climate Policy* 2 (2–3), 129–144.
- 254 Burton, I., Huq, S., Lim, B., Pilifosova, O., Schipper, E.L., 2002. From impact assessment to adaptation priorities: the shaping  
 255 of adaptation policy. *Climate Policy* 2 (2), 145–159.
- 256 Cohen, S., Demeritt, J., Robinson, J., Rothman, D., 1998. Climate change and sustainable development: towards dialogue. *Global*  
 257 *Environ. Change* 8 (4), 341–371.
- 258 Huq, S., Sokona, Y., 2001. Climate Change Negotiations: A View from the South. Opinion: World Summit on Sustainable  
 259 Development. International Institute for Environment and Development, London.
- 260 Jamieson, D. 2001. Climate change and global environmental justice. In: Edwards, P., Miller, C. (Eds.), *Changing the Atmosphere:*  
 261 *Expert Knowledge and Global Environmental Governance.* MIT Press, Cambridge.
- 262 Lélé, S.M., 1991. Sustainable development: a critical review. *World Dev.* 19 (6), 607–621.
- 263 Metz, B., Davidson, O., Swart, R., Pan, J. (Eds.), 2001. *Climate Change 2001: Mitigation.* Intergovernmental Panel on Climate  
 264 Change, Third Assessment Report. Cambridge University Press, Cambridge, UK.
- 265 Moomaw, W., Ramakrishna, K., Gallagher, K., Freid, T., 1999. The Kyoto Protocol: a blueprint for sustainable development. *J.*  
 266 *Environ. Dev.* 8 (1), 82–90.
- 267 Morita, T., Robinson, J., Adegbulugbe, A., Alcamo, J., Herbert, D., Lebre La Rovere, E., Nakicenovic, N., Pitcher, H., Raskin,  
 268 P., Riahi, K., Sankovski, A., Sokolov, V., de Vries, B., Zhou, D., 2001. Greenhouse Gas Emission Mitigation Scenarios and  
 269 Implications, pp. 115–166 (Metz et al., 2001).
- 270 Munasinghe, M., 1992. *Environmental Economics and Sustainable Development* (originally presented at the United Nations  
 271 Conference on Environment and Development, Rio de Janeiro, Brazil), World Bank, Washington, DC.
- 272 Munasinghe, M., 2000. Development, equity and sustainability in the context of climate change. In: Munasingha, M., Swart, R.  
 273 (Eds.), *Climate Change and its Linkages with Development, Equity, and Sustainability: Proceedings of the IPCC Expert*  
 274 *Meeting on Development, Equity and Sustainability,* Colombo, Sri Lanka, 27–29 April, pp. 13–66. IPCC and World  
 275 Meteorological Organization, Geneva.

- 276 Munasinghe, M., 2001. Exploring the linkages between climate change and sustainable development: a challenge for  
277 transdisciplinary research. *Conserv. Ecol.* 5(1):14 [online] URL: <http://www.consecol.org/vol5/iss1/art14>.
- 278 Munasinghe, M., 2002. The sustainomics trans-disciplinary meta-framework for making development more sustainable:  
279 applications to energy issues. *Int. J. Sustainable Dev.* 5 (1–2), 125–182.
- 280 Munasinghe, M., Swart, R. (Eds.), 2000. Climate change and its linkages with development, equity, and sustainability. In:  
281 Proceedings of the IPCC Expert Meeting on Development, Equity and Sustainability, Colombo, Sri Lanka, 27–29 April,  
282 1999. IPCC and World Meteorological Organization, Geneva.
- 283 Najam, A., 2000. The case for a law of the atmosphere. *Atmos. Environ.* 34 (23), 4047–4049.
- 284 Najam, A., Cleveland, C.J. Energy and Sustainable Development at Global Environmental Summits: An Evolving Agenda, *Int.*  
285 *J. Environ. Sustainability*, in press.
- 286 Najam, A., Page, T., 1998. The climate convention: deciphering the Kyoto Protocol. *Environ. Conserv.* 25 (3), 187–194.
- 287 Najam, A., Sagar, A., 1998. Avoiding a COP-out: moving towards systematic decision-making under the climate convention.  
288 *Climatic Change* 39(4).
- 289 Najam, A., Huq, S., Sokona, Y., 2003. Moving beyond Kyoto: developing countries, climate change and sustainable development.  
290 *Climate Policy* 3(3).
- 291 Nakicenovic, N., Swart, R.J. (Eds.), 2000. IPCC Special Report on Emissions Scenarios. Cambridge University Press, Cambridge,  
292 UK.
- 293 Opschoor, J., 1992. *Environment, Economics and Sustainable Development*. Groningen, The Netherlands.
- 294 Parikh, J., 1992. IPCC response strategies unfair to the south. *Nature* 360, 507–508.
- 295 Parikh, J., Babu, P.G., Kumar, K.S.K., 1997. Climate change, north–south co-operation and collective decision-making post Rio.  
296 *J. Int. Dev.* 9 (3), 403–413.
- 297 Pichs-Madruga, R. (Ed.), 2001. In: Proceedings of the Report of the Second IPCC Expert Meeting on Development, Equity, and  
298 Sustainability, Havana, Cuba, 23–25 2000.
- 299 Rahman, A.A., 1997. Climate change: the south is acting, *Our Planet* 9(3).
- 300 Ravindranath, N.H., Sathaye, J.A., 2002. *Climate Change and Developing Countries*. Kluwer Academic Publishers, Dordrecht.
- 301 Rayner, S., Malone, E. (Eds.), 1998. *Human Choice and Climate Change*. Battelle Press, Columbus, OH.
- 302 Robinson, J., Herbert, D., 2001. Integrating climate change and sustainable development. *Int. J. Global Environ. Issues* 1 (2),  
303 130–148.
- 304 Sagar, A., Banuri, T., 1999. In fairness to current generations: lost voices in the climate debate. *Energy Policy* 27 (9), 509–514.
- 305 Sagar, A., Kandlikar, M., 1997. Knowledge, rhetoric and power: international politics of climate change. In: *Economic and*  
306 *Political Weekly*, 6 December, p. 3140.
- 307 Shukla, P.R., 1999. Justice, equity and efficiency in climate change: a developing country perspective. In: F. Toth (Ed.), *Fairness*  
308 *Concerns in Climate Change*. Earthscan Publications, London.
- 309 Smit, B., Pilifosova, O., Burton, I., Challenger, B., Huq, S., Klein, R.J.T., Yohe, G., 2001. Adaptation to climate change  
310 in the context of sustainable development and equity. In: *Climate Change 2001: Impacts, Vulnerability and Adaptations*  
311 (Third Assessment Report of the Intergovernmental Panel on Climate Change, IPCC). Cambridge University Press, London,  
312 pp. 877–912.
- 313 Sokona, Y., Humphreys, S., Thomas, J.-P., 1999. Sustainable development: a centrepiece of the Kyoto Protocol—an African  
314 perspective. In: *Towards Equity and Sustainability in the Kyoto Protocol*. SEI, Stockholm/Boston.
- 315 Toth, F.L., Mwandosya, M., Carraro, C., Christensen, J., Edmonds, J., Flannery, B., Gay-Garcia, C., Lee, H., Meyer-Abich, K.M.,  
316 Nikitina, E., Rahman, A., Richels, R., Ruqiu, Y., Villavicencio, A. Wake, Y., Weyant, J., 2001. *Decision Making Frameworks*  
317 (Metz et al., 2001).
- 318 Watson, R. (Ed.), 2001. *Climate Change 2001: Synthesis Report*. Cambridge University Press, Cambridge.
- 319 Watson, R., 2002. The future of the intergovernmental panel on climate change. *Climate Policy* 2 (4), 269–271.