

Sustainable Development: Towards A New Paradigm For India

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Abstract

Using the Nyamjang Chhu hydropower project in northeast India, in context of the Environment Impact Assessment process in India, this paper argues that the current model of development in India needs to be re-evaluated, and the effects of cultural marginalisation and breakdown of traditional social structures and livelihoods be properly accounted for in impact assessments to achieve development that is sustainable for all stakeholders involved.

1. Introduction

The Brundtland Commission's definition of sustainable development asked for a balance to be struck between the needs of the present with the responsibilities owed to future generations.¹ Even so, its interpretation and usage would vary from country to country. What is universally acknowledged, though, is the need for a careful and holistic examination of the extent to which present development practices can have a bearing on all the involved stakeholders. Unfortunately, the gap between idea and practice seems only to be growing. In developing nations, economic growth is given primordial importance, perhaps to the detriment of ecological and social impact.² While this can sometimes be attributed to the absence of effective policies and institutional frameworks, it is a worrisome state of affairs when decades after these ideas were formulated, implementation is still lacking, bordering on dangerous abandonment.

The economic allure of India's North Eastern states for hydroelectric power generation, often times blinds those responsible to the other concerns, specifically enviro-socio-cultural rights. In India's case, the Environmental Impact Assessment experience points to glaring deficiencies in the practical manifestations of the process. It has been observed that social structures and traditional livelihoods are not taken into account in proportion to their relevance to the affected universe, while evaluating the implication of projects using the EIA as it currently stands. This paper uses the case of the Nyamjang Chhu project as an example of the potentially gargantuan costs associated with the lack of a meaningful impact assessment process and argues the need for strengthening domestic enforcement mechanisms, through a contextual adaptation of good practices from elsewhere in the world.

1Report of the World Commission on Environment and Development: Our Common Future. (1987). Retrieved from <http://www.un-documents.net/our-common-future.pdf>.

2Williams, A. & Porter, S. (2006). Comparison of Hydropower Options for Developing Countries with Regard to the Environmental, Social and Economic Aspects. Retrieved from http://www.udc.edu/docs/cere/Williams_Porter.pdf

2. Sustainable Development & the Indian Constitution

Article 21 of the Constitution of India guarantees the right to life and personal liberty to all persons within the country.³ Over the years, the Supreme Court of India, the country's highest judicial authority and interpreter of the Constitution, has ruled several times that sustainable development and the right to a clean environment are enshrined in Article 21 and also encouraged legal recourse in the form of public interest litigation, especially in matters related to the environment.⁴ Relying on the globally accepted practices and standards relating to sustainable development, specially making use of the 'precautionary' and the 'polluter pays' principles, the Supreme Court has opened the gateway for environmental justice related jurisprudence in India. Although the judiciary is mindful of the fact that India remains to be a developing nation where economic progress is indispensable, it has made praiseworthy attempts to strike a balance between progress and the protection of enviro-social rights. This is evident from the widely lauded judgment in the *Narmada Bachao Andolan*⁵ case, where the court defined sustainable development by limiting the extent of development to the point where it can be sustained by nature with or without human interference to mitigate effects. In several instances, the Supreme Court has issued a stay on construction of hydro power projects until further research on its impacts can be carried out and directing that varied stakeholders such as the World Wildlife Fund for India, the Central Electricity Authority and the Central Water Commission be duly consulted by the Ministry of Environment, Forest & Climate Change before issuing further clearances for construction.⁶

Aside from this, India has numerous legal instruments, such as the Environment (Protection) Act and Water (Prevention and Control of Pollution) Act, 1974 to name a few which aid its conformity with international best practices in environment protection and conservation.

Although the judiciary has attempted to ensure that basic rights are not violated, it paints a bleak picture of the policy instruments and implementation in India vis-à-vis sustainable development best practices. Although impact evaluation tools are available, it is becoming clearer that they are not appropriately utilised.

3. Impacts of Small Hydro Projects

The world over, a shift is being attempted from traditional methods of energy production to cleaner, less polluting sources. Before branding them safe and the answer

³Article 21, Constitution of India.

⁴Kirpal, B. N., Justice. (2002). Developments in India Relating to Environmental Justice. Retrieved from <http://www.unep.org/delc/Portals/119/publications/Speeches/INDIA%20.pdf>.

⁵*Narmada Bachao Andolan v. Union of India*, AIR 2000 SC 3751.

⁶Levitan, D. (2014) As Small Hydropower Expands, So Does Caution on Its Impacts. Yale Environment 360. Retrieved from http://e360.yale.edu/feature/as_small_hydropower_expands_so_does_caution_on_its_impacts/2790/.

to our future energy concerns, however, it is important that the impacts of such schemes – both environmental and social – be understood. Small or mini hydro projects are often preferred because of the commonly perceived notion that they cause minimal to no environmental damage. The International Energy Agency has very succinctly, in a report, described the effects of small hydropower to be ‘small and localised’. Actual proof of the same, however, is conspicuous by its absence in the IEA reports.⁷ The ecological impacts of small hydro power projects are generally associated with causing a change in the migratory patterns of the species inhabiting and visiting the area of construction, affecting water routes of rivers and other bodies and affecting the quality of water.⁸ This was confirmed in the evaluation reports of the four small hydro-power projects constructed in Sweden.⁹ Similarly, in France, problems relating to the quality of aquatic habitat have been reported at multiple of its small hydro power projects, including the barrages at La Goule Noire, Haute et Basse chute and Mirebel–Lanchâtre.¹⁰ In neighbouring Austria, impacts have been felt in its major rivers such as the Schwarze Sulm and the Mur¹¹ as in Germany’s river tributaries and mountains, which have seen a change in migratory patterns of several species. Similarly, aquatic species (more particularly salmon) have been unable to utilise their traditional breeding grounds due to the effect of small hydro power plants in Spain.¹²

While the ecological impacts of small hydro schemes are often debated and recorded, their social impacts are often ignored. However, these can be just as serious and permanent. Areas suddenly flooded with construction work and development of small scale hydro projects are known to be associated with problems including forced displacement of the local population which also results in the loss of traditional livelihoods as is witnessed in the agricultural valley populations of the Zambezi and Niger rivers.¹³ Loss of cultural heritage, whether it be in terms of historical landmarks or traditional practices have also known to result from inadequate assessment of potential

7Abbasi, T. & Abbasi, S.A. (2011). Small Hydro and the Environmental Implications of its Extensive Utilization. *Renewable and Sustainable Energy Reviews*, 15 (4), 2134-2143.

8Levitan, D. (2014). As Small Hydropower Expands, So Does Caution on Its Impacts. *Yale Environment* 360. Retrieved from http://e360.yale.edu/feature/as_small_hydropower_expands_so_does_caution_on_its_impacts/2790/.

9Rudeberg, P.M., et. al. (2015). Mitigating the Adverse Effects of Hydropower Projects: A Comparative Review of River Restoration and Hydropower Regulation in Sweden and the United States. *The Georgetown International Environmental Law Review*, 27, 251 -273.

10Report of the European Small Hydropower Association (2011). Retrieved from https://ec.europa.eu/energy/intelligent/projects/sites/iee-projects/files/projects/documents/sherpa_environmental_barometer_shp.pdf

11Report of the European Small Hydropower Association (2011). Retrieved from https://ec.europa.eu/energy/intelligent/projects/sites/iee-projects/files/projects/documents/sherpa_environmental_barometer_shp.pdf

12Report of the European Small Hydropower Association (2011). Retrieved from https://ec.europa.eu/energy/intelligent/projects/sites/iee-projects/files/projects/documents/sherpa_environmental_barometer_shp.pdf

13Cernea, M. M. (2004). Social Impacts and Social Risks in Hydropower Programs: Preemptive Planning and Counter-risk Measures. Retrieved from http://www.un.org/esa/sustdev/sdissues/energy/op/hydro_cernea_social%20impacts_backgroundpaper.pdf.

projects and the construction reliant on these assessments.¹⁴ As it stands today, lack of adequate focus on social impacts is a global phenomenon in the renewable energy sector and it is perhaps time for a reconsideration of the approach and policy frameworks governing impact evaluations. The Nyamjang Chhu hydroelectric power project (HEP) in Arunachal Pradesh (in north-east India) is such a recent story of failed environmental (including social) impact assessment of small hydropower in the developing world, with crucial lessons which have been attempted to be brought out hereinafter.

4. Nyamjang Chhu: The Dam, the Arguments, the Judgment

Back in 2008, the then Minister of State for Environment and Forests, Mr. Jairam Ramesh, referred to the Arunachal Pradesh state government as having been inflicted by an 'MoU virus'.¹⁵ The statement was made with direct reference to the spate of agreements being signed across the state - about 108 since 2006, for generation of about 30,000 MW of hydropower. The manner in which these were done was also questionable, but that is a discussion which merits its own space and time. The Nyamjang Chhu project is a symptom of this mushrooming of hydropower projects in Arunachal Pradesh. As projects go, it is relatively nondescript - a run-of-the-river project with a planned potential of 780 MW. It was commissioned in 2006, with the environmental impact assessments conducted in 2007-08. What distinguishes it from most others is that it was proposed to be sited at an area which is the one of the last remaining wintering habitats for a vulnerable species - the black-necked crane, or *grus nigricollis*. This species of crane is also of great cultural significance to the local Monpa Buddhist community, who believe it to be an incarnation of the sixth Dalai Lama, and therefore consider it sacred. The presence of this unique species at the project site has led to an interesting story in the impact assessment process for the Nyamjang Chhu project - not least from an enviro-legal perspective.

Environmental Impact Assessment (EIA) in India is mandatory for such hydropower projects: Nyamjang Chhu falls within category 'A' as per the EIA Notification.¹⁶ This means that a three-step process is required to be followed to obtain environmental clearance¹⁷ from the nodal Ministry of Environment, Forests and Climate Change (MoEFCC), a *sine qua non* for the project to successfully take off. This process entails

- Scoping, or the determination of the Terms of Reference (ToR) for the EIA study by the Expert Appraisal Committee (EAC), an independent body of experts constituted by the MoEFCC;

¹⁴Cernea, M. M. (2004). Social Impacts and Social Risks in Hydropower Programs: Preemptive Planning and Counter-risk Measures. Retrieved from http://www.un.org/esa/sustdev/sdissues/energy/op/hydro_cernea_social%20impacts_backgroundpaper.pdf.

¹⁵Chakravarty, A. (2011). MoU virus hits Arunachal Pradesh. Down to Earth. Retrieved from <http://www.downtoearth.org.in/news/mou-virus-hits-arunachal-pradesh-33962>. The hydropower potential in the state is a direct function of its geographical location - at the north-eastern end of India, in the Eastern Himalayan geographic zone.

¹⁶Paragraph 2 read with Item 1(c) of the Schedule, EIA Notification, 2006.

¹⁷An additional step - Screening - is required in category 'B' projects, to determine whether impact assessment studies are required to be carried out at all.

- Public consultation, or the ascertainment and inclusion in the project design of all material concerns of the local affected persons, and others who have a 'plausible stake in the environmental impacts of the project'; and
- Appraisal, the scrutiny by the EAC of the final EIA report (with necessary additions/changes made after the public consultation process) and its recommendation for grant or rejection of environmental clearance to the MoEFCC.

It is evident from the above that to fulfil its function as an effective decision-making tool, the EIA process depends to a large extent on the effectiveness of (i) the EAC, and (ii) the public consultation process. Christopher Wood concluded something similar, in his comparative review of EIA systems. He emphasized the importance of the 'critical examination of proposals' (as opposed to mere processing of acceptable proposals), as well as of an open, fair and participative process.¹⁸ The EACs recommendation at the appraisal stage, to be meaningful, must necessarily be predicated on an EIA report to which it has applied its collective mind. This holds good at the prior stage of scoping as well - the terms of reference, as per the EIA Notification, are to be framed on the basis of the information supplied by the project proponent, as well as information that may be available with the EAC. Whether it is a function of this weak wording; or of the purely advisory role of the EAC¹⁹ (which may well serve to disincentivise the EAC from expending extra effort on a recommendation which is ultimately irrelevant); or of the historical context of the process and the competing politico-economic interests that ultimately frame outcomes in practice - EACs have generally not been able to occupy the pro-active niche that they ought to within the impact assessment framework in India. The EAC for river valley and hydroelectric power projects, for example, has never exercised its power to reject project proposals at the scoping stage;²⁰ choosing to ask proponents to reformulate faulty proposals rather than reject them outright.²¹

In the appeal filed before the National Green Tribunal,²² challenging the environmental clearance granted to the project proponent of the Nyamjang Chhu HEP, one of the main grounds on which the clearance was assailed was the lack of application of mind on the part of the EAC. It was argued on behalf of the appellants that both at the stages of

¹⁸Wood, C. (1995) *Environmental Impact Assessment: A Comparative Review*. Essex: Longman Group Ltd.

¹⁹To the MoEFCC, which is likely to often totally disregard the EACs recommendations.

²⁰It is legally empowered to do so, vide paragraph 7(II)(iii) of the EIA Notification, 2006.

²¹Between 2007-2012, a number of projects were proposed which were partially sited within protected areas - like Sainj HEP in the vicinity of the Great Himalayan National Park, and Bara Bangahal HEP partially sited within the Dhauladhar Wildlife Sanctuary. In spite of the ecological sensitivity of their locations, alternatives were not explored. Even in the case of improperly formulated, faulty proposals, pre-construction activities are approved in an alarmingly perfunctory manner, accompanied only with the regulatory equivalent of a rap on the hand. See http://sandrp.in/env_governance/EAC_meetings_Decisions_All_India_Apr_2007_to_Dec_2012.pdf.

²²Save Mon Region Federation and Anr. v. Union of India and Ors. Appeal No. 39/2012 before the Principal Bench, National Green Tribunal, available at [http://greentribunal.gov.in/Writereaddata/Downloads/39-2012\(PB-II-Judge\)APL7-4-2016.pdf](http://greentribunal.gov.in/Writereaddata/Downloads/39-2012(PB-II-Judge)APL7-4-2016.pdf). Save Mon Region Federation (the first appellant) is a civil society organisation of the people of Arunachal Pradesh, established with the objective of challenging hydropower project proposals in the state that run contrary to perceived ecological or social interests.

scoping as well as appraisal, the EAC fell well short of its mandate. This was reflected in the glaring omission of certain terms of reference (for the EIA study) which were indisputably critical to the impact assessment of the project - such as the impact assessment of the smaller Khangteng HEP (the captive power source for the construction of the larger Nyamjang Chhu project), cumulative impact assessment for the two projects and ancillary structures, and riverine basin studies for the Tawang basin. The Ministry in reply stated that the EAC had scrutinised all information and critically applied its mind to the proposal - it cited a report in support of this, which had been considered by the EAC in 2015, on the carrying capacity of the Tawang Basin. It was not clarified, however, how the consideration of that report by the EAC in 2015 could have had any bearing on a clearance granted in 2012.

Curiously, the project proponent had also misinformed the EAC²³ regarding the fact that the project site overlapped with one of the few remaining wintering sites for the black-necked crane in India (in addition to being a habitat for 3 rare mammals - the red panda, the snow leopard and the Arunachal macaque²⁴), in the application for clearance.²⁵ The applicant was bound to disclose in the proposal whether any area within 15 km of the proposed project boundary was used by any species as a breeding, nesting, foraging, wintering or resting site. Had the EAC exercised the full range of its powers at the scoping stage; this material omission may well have invited proceedings towards rejection of the proposal for environmental clearance.²⁶

The other crucial cog in an effective EIA process which was indicated earlier - the public consultation process - was also the other major contentious issue before the Tribunal in *Save Mon Region Federation*. Although the specific ground of appeal in this regard²⁷ was not discussed or adjudicated upon in the judgment (the Tribunal chose to dispose of the appeal on the initial ground, of deficiencies in the scoping process), its importance in the EIA process is moot. Public participation in environmental decision-making has massive benefits: it fulfils the ideals of a democratic state; it augments the quality of the environmental decisions through a synthesis of more diverse perspectives (than would have been available without it); and it ensures the social legitimacy (and thereby, sustainability) of the environmental decisions so reached.²⁸ It has been argued that, in spite of these rationales being well-known, public participation processes often fail to be meaningful or effective due to the manifestation of the power imbalance that exists

²³Paragraph 15, *Save Mon Region Federation and Anr. v. Union of India and Ors.*, Appeal No. 39/2012 before the Principal Bench, National Green Tribunal.

²⁴Paragraph 15, *Save Mon Region Federation and Anr. v. Union of India and Ors.*, Appeal No. 39/2012 before the Principal Bench, National Green Tribunal.

²⁵Form I, at Appendix I to the EIA Notification, 2006, requires the applicant (project proponent) to furnish comprehensive details regarding the environmental sensitivity of the project area.

²⁶Paragraph 8(vi) of the EIA Notification, 2006 - "Deliberate concealment and/or submission of false or misleading information or data, which is material to screening or scoping or appraisal or decision on the applications shall make the application liable for rejection..."

²⁷Paragraph 5, *Save Mon Region Federation and Anr. v. Union of India and Ors.*, Appeal No. 39/2012 before the Principal Bench, National Green Tribunal.

²⁸Martin, T. (2007). Muting the Voice of the Local in the Age of the Global: How Communication Practices Compromised Public Participation in India's Allain Duhangan Environmental Impact Assessment. *Environmental Communication*, 1(2), 172-174.

between the competing interest groups in the EIA process²⁹: rather than an approach to synthesize an appropriate solution through the distillation of various perspectives from different value systems, the approach (in the Nyamjang Chhu case, for instance) is generally one where a predetermined decision is sought to be justified to the locally affected persons by the proponent.³⁰ This approach is usually characterised by a low degree of access to information - as was the case in the Nyamjang Chhu EIA process, where a faulty draft EIA report (with patently misleading information) was presented to the public for comments. The same was then used by the proponent to justify the lack of mention of the black-necked crane (and other biodiversity concerns) on the part of the locally affected persons at the public hearing.³¹ The Tribunal, in its wisdom, noted that the errors and faults at the scoping stage had a cascading effect and rendered the EIA ineffective - but ought to have separately underscored the need for a workable independent public consultation process as well; which, if nothing else, could have served as a strong kickstarter for a more focused national discourse around this all-important element of environmental impact assessment.

5. Learnings and Looking Ahead

The judgment of the National Green Tribunal in *Save Mon Region Federation* exposed certain institutional deficiencies in the Indian process of EIA, which need to be addressed if impact assessment is to have any semblance of legitimacy and meaning in decision-making. First and foremost, the EIA Notification has to effectively embody the broad definition given to the ‘environment’ in its parent statute - the Environment (Protection) Act of 1986. Section 2(a) of this Act defines the environment to include “*water, air and land and the inter-relationship which exists among and between water, air and land, and human beings, other living creatures, plants, micro-organisms and property*”. The ‘inter-relationship’ that exists between human beings and ‘other living creatures, plants...’ is not recognised, intangible as it is, in the environmental impact assessment process. There is no way to capture these relationships in Form I of the proposal submitted at the scoping stage, for example. The few questions that pertain to social impact assessment in Form I can not entirely capture the complete breakdown of social fabric that is a common externality of hydropower projects like Nyamjang Chhu. The impacts that rehabilitation and resettlement have on populations are far-reaching: Forced occupational shifts, conflicts between the resettled population and the local communities are just the visible parts. The change in flow regime of the river has cascading downstream livelihood impacts as well, which are difficult to measure and capture.³² The

29R.K. Morgan, “Environmental impact assessment: the state of the art” Vol. 30(1) Impact Assessment and Project Appraisal (2012) at 5-14.

30A. Diduck, J. Sinclair, D. Pratap and G. Hostetler, “Achieving meaningful public participation in the environmental assessment of hydro-development: case studies from Chamoli district, Uttarakhand, India” Vol. 25(3) Impact Assessment and Project Appraisal (2007) at 219-231.

31Paragraph 17, *Save Mon Region Federation and Anr. v. Union of India and Ors.*, Appeal No. 39/2012 before the Principal Bench, National Green Tribunal.

32Menon, M., Vaghlikar, N., Kohli, K., & Fernandes, A. Large Dams in the Northeast - Issues and Concerns. (2005). Large Dams for Hydropower in Northeast India: A Dossier. In Menon, M., Kohli, K. (Eds.). New Delhi: Kalpavriksh and South Asia Network on Dams, Rivers and People.

cultural dissociation and loss of identities that result from the divorce, even more so. The argument sought to be made here is not against the environmental decisions themselves. It is rather to make them better informed and more legitimate by making more robust and transparent *the processes* through which they are reached. If the EIA process is meaningful and transparent, the decisions arrived at thereby will be more legitimate and sustainable (and less likely to be stalled by costly litigations or local agitations). There is thus a very real incentive here for the institutions that view the EIA process as a cumbersome roadblock to change their perception.

There are lessons that can be borrowed from elsewhere around the globe to strengthen the EIA process in India. It is commonly accepted that to be meaningful, public participation needs to be included at the earliest practicable stage in the EIA process.³³ The federal EIA process in the United States is worth mentioning in this regard - the National Environmental Policy Act of 1969 (NEPA) broadly mandates the involvement of relevant federal agencies as well as the public at all stages, in formulating environmental impact statements.³⁴ This hasn't, however, translated into practice the way it was intended to - owing in part to the lack of enforceability of the largely procedural NEPA. The Netherlands have fared better here - with a more streamlined mandate for public consultation at the scoping and review stages under the Environmental Management Act of 1994.³⁵ It may be useful to explore adapting this to the Indian context - a set of ToR vetted by stakeholders might not only provide for a more comprehensive impact assessment, it will also ensure a less frictional EIA process with greater equality of information between the stakeholders. This will, of course, need to be supplemented with adequate control measures from the government - institutional strengthening of the EAC would be an excellent start. The traditional knowledge and concerns that will come from the locally affected persons would be well complemented by the EAC critically examining the ToR using its own scientific expertise, at the stage of scoping - resulting in a more robust, comprehensive EIA report. Stronger wording of the EACs duties in the EIA Notification, greater accountability of the MoEFCC for departing from the recommendations of the EACs and increasing the resource base of the EACs themselves: a combination of these could work well to involve the EACs in a more effective way in the EIA process. This would all, of course, translate into no practical change unless accompanied by action towards nullifying the effect of power

33Martin, T. (2007). Muting the Voice of the Local in the Age of the Global: How Communication Practices Compromised Public Participation in India's Allain Duhangan Environmental Impact Assessment. *Environmental Communication*, 12,188. The International Finance Corporation (the private-lending arm of the World Bank) also recognises in theory the need for early stakeholder consultation, especially in 'emerging markets'. See International Finance Corporation, *Stakeholder Engagement: A Good Practice Handbook for Companies Doing Business in Emerging Markets*. (2007). Washington D.C.: IFC. Retrieved from http://www.ifc.org/wps/wcm/connect/938f1a0048855805beacfe6a6515bb18/IFC_StakeholderEngagement.pdf?MOD=AJPERES.

34Wood, C. (1995). *Environmental Impact Assessment: A Comparative Review*. Essex: Longman Group Ltd.

35Wood, C. (1995). *Environmental Impact Assessment: A Comparative Review*. Essex: Longman Group Ltd. It is important to take this conclusion with a pinch of salt - this success may owe a great deal to the lack of heterogeneity of interests in a country like the Netherlands, as opposed to one like India. Building consensus and legitimacy around decisions may therefore be a logistically easier task in the smaller countries of Europe as opposed to a more diverse developing economy like India.

dynamics that have hitherto dictated the flow of information in EIAs in India. It seems like a lot of work - and it will be - but there are adequate incentives, as indicated earlier, for the powers that be to make an effort towards achieving environmentally sound and socially legitimate developmental decision-making.

Conclusion

That environmental impact assessments are an inalienable part of sustainable development has been trite knowledge ever since the Rio Summit in 1992 (even longer in the United States, which has had impact assessments in some form or the other since 1969). Its apologists do not any longer have the luxury of recourse to its nascence as a justification for its systemic faults, nor do they have time on their side to argue or criticise in abstraction. What has been concluded as problematic in the EIA process in this paper by way of reference to the case of the Nyamjang Chhu HEP is almost identical to what was stated to be critical to an effective EIA almost two decades ago.³⁶ It isn't lack of knowledge, therefore, that is responsible for the persistence of these problems. Correcting these systemic issues requires, first, the recognition of two critical dimensions of developmental decisions: (i) the social impacts of the breakdown of the primal relationship between a land and its people are multifarious and far-reaching,³⁷ and require more serious consideration than has been given hitherto in the 'cost-benefit approach' to impact assessment; and (ii) the power of incentives, both intended and perverse, for different categories of stakeholders. If there is political will to recognise these, there is every likelihood of positive action towards building a more meaningful public consultation and review process - and thereby, more meaningful, and sustainable, development.

³⁶See generally Wood, C. (1995). *Environmental Impact Assessment: A Comparative Review*. Essex: Longman Group Ltd.

³⁷See generally Vivian J. et al. (1994). *Environmental Degradation and Social Integration*, UNRISD Briefing Paper No. 3, World Summit for Sustainable Development.

