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How is environmental conflict addressed by SIA?

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ABSTRACT

The fields of Environmental Conflict Management (ECM), Environmental Conflict Resolution (ECR), and Peace and Conflict Impact Assessment (PCIA) have become well established; however, as yet there has not been much use of Social Impact Assessment (SIA) to manage environmental conflicts. ECM, ECR and PCIA are mainly undertaken when problems are advanced or, more likely, have run their course (post-conflict). This paper examines how conflict is addressed by SIA and whether there is potential to develop it for more proactive assessment of conflicts (pre-conflict or while things develop). SIA has the potential to identify and clarify the cause(s) of environmental and natural resources conflicts, and could possibly enable some avoidance or early mitigation. A promising approach may be for 'conflict-aware' SIA to watch for critical conflict stages or thresholds and to monitor stakeholders. Effective conflict-aware SIA might also significantly contribute to efforts to achieve sustainable development.

1. Introduction

This paper explores how Social Impact Assessment (SIA) might improve the management of environmental and natural resources conflicts. There are many post-conflict appraisals, but few attempts to provide advanced warning or make assessments before conflicts finish. Environmental Conflict Resolution (ECR), Environmental Conflict Management (ECM) and Peace and Conflict Impact Assessment (PCIA) are widely practiced but there has been little development of proactive conflict-aware SIA. This paper examines whether there are recognisable conflict stages and thresholds that could be used by conflict-aware SIA, and also tries to establish what might be promising approaches.

There is no universal definition of SIA; perhaps the best is that provided by Vanclay (2003:6): "...the process of analysing, monitoring and managing the social consequences of development." Alternatively, SIA could be described as a process that seeks to assess whether a proposed development will alter quality of life and sense of well-being, and how well individuals, groups and communities adapt to the changes (see also: Vanclay, 1999; 2002, 2004; Becker and Vanclay, 2003; Burdge, 2004). An SIA should consider what would happen if the proposed development did not take place, explore ways of avoiding or mitigating adverse (especially irreversible) impacts and flag likely or apparent beneficial impacts and opportunities. Increasingly the process also seeks to inform and involve stakeholders and make developers more reflective and accountable. There are three possible points for application of conflict-aware SIA: pre-conflict; in-conflict; and post-conflict. SIA must be applied early if it is to support proactive governance and management, so pre-conflict application is desirable but that is currently much less common than post-conflict usage. Whenever it is used SIA can aid in understanding the cause(s) of conflict, may help make developers more accountable, might help integrate diverse disciplines involved in planning, and thereby assist efforts to achieve sustainable development (Cox et al., 2000; Cavaye, 2003).

It is not uncommon for a project, programme or policy to 'succeed' in the sense that it meets its planned goals, yet be overshadowed by problems and conflict it provokes (Westman, 1985). Failed developments can also trigger conflict, change independent of any development that can cause or ease problems, and a development or an unrelated change may highlight or catalyse already developing conflict.

Before proceeding further it is useful to try to clarify the meanings of *development* and *conflict*. Definitions of *development* reflect the current values of those involved. So, what was once seen as development may no longer appear to be because opinions vary over time and between groups or among individuals. There can be no precise and universal definition. However, most accept it is a process of change, often multidimensional, and something many governments, bodies or individuals aspire to prompt and steer. Development may not progress toward 'better' conditions; there can be no change or deterioration. The focus of development can be economic, social, technological, cultural, etc. Progress may not be marked by more disposable income, but by greater security, improved sense of well-being, more fulfilled and healthy life, etc. Before the 1970s there was little concern for environmental quality or social welfare; that has changed and there has also been the establishment of the concept of sustainable development. The latter may be crudely defined as development,

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which maintains achievements for those involved without reducing the options of others now and in the future. Development may be pursued at an individual, local, regional, national or international scale, through projects, programmes or policies, or simply the promulgation of a message. The process can be orchestrated from the bottom-up, or from the top-down; it can be short-term or longer-term in focus, planned and managed or more casual, even unconscious.

One definition of a *conflict* is that is a "...perceived divergence of interests, or belief that the various stakeholders' current aspirations cannot be achieved simultaneously" (Persson, 2006: 3). For a somewhat different definition, see: International Alert (2006). An environmental conflict can manifest as political, social, economic, ethnic, religious or territorial strife or discontent over resources, or national interests (Spillmann and Bächer, 2005). Conflict can be non-violent or violent but either can be damaging. Occasionally conflict prompts change and progress; often there are opportunities as well as problems. Cause(s) of conflict can often be identified, although there may be situations where perceptions are unclear or disagreement is based on long-forgotten events or unfounded prejudice. Sometimes a conflict is preceded by an obvious crisis, a realization that a threshold could be crossed leading to serious trouble. Crisis warning and crisis management may be able to contribute something to conflict prediction. For example, the crisis may be at a 'hot-spot' and occur well before a more general problem.

Divergence of interest may be expressed in ways short of public disagreement, let alone serious violence, but even restrained conflict can have serious consequences. Those in disagreement may fail to cooperate, might fail to share useful information, etc. Conflict can arise when stakeholders benefit, as far as impartial outsiders can judge, to broadly the same degree. Often disagreement reflects divergent beliefs or habits. So, there may not always be a clear initial crisis.

2. Conflict and Social Impact Assessment

Projects, plans, programmes, policies, cultural development or socio-economic development in general and environmental changes run the risk of creating or exacerbating conflicts. During the process of preparing proposals SIA might be used to anticipate and thereby give a chance for reducing destructive conflicts. It may also be possible to run a SIA if precursors of conflict become apparent to monitoring bodies, NGOs, or whoever is vigilant. Vanclay (2004: 274) found that a number of conflict related SIAs had been conducted by 2003. However, most of those, and the majority of subsequent conflict related SIAs have been initiated post-conflict. So the potential of conflict-aware SIA has not really been adequately recognised or developed.

2.1. Social Impact Assessment

In some cases, developers do not adequately understand the potential and scope of SIA to improve proposals prior to decision-making, although this is changing (see Esteves and Vanclay, 2009). There may also be situations where things other than the proposed development are causing impacts, such as ongoing social or economic trends, environmental change, etc. SIA should be initiated before any developing conflict or proposal progresses too far to facilitate choice of best way forward and to give a chance of proactive management. In practice, SIA has mainly been applied to initiated projects, expected changes (social, economic, technical and environmental), already developing conflicts, ongoing programmes and policies, and post-development (or dispute) situations. Before those points, funding is unlikely to be forthcoming and the need little perceived. One of the basic demands for useful environmental SIA is to ensure it is applied as early as possible in order to try and: offer early-warning; establish causation; assess likely effects. Realistically, the best that can usually be expected is SIA application early in-conflict, which would at least offer the latter two benefits. It might be useful to explore ways to fund rapid response conflict-aware SIA and establish bodies to watch for situations which merit its application. If that sort of proactive approach found a situation deserving a full conflict-aware SIA, efforts should be made not to adopt too narrow a focus and to explore the full context of the dispute, proposal or development.

A *social impact* may be broadly defined as the consequences of any action that alters how people live, think, behave, and react to each other (Burdge, 2004). The impact lies somewhere on the scale from good via insignificant to bad. Social impacts include social, cultural, health, and psychological impacts. A social impact can be real or perceived and affect individuals, families, groups, societies, countries, and even the global community. Social impacts can result from environmental and/or socio-economic changes, including technical and cultural innovation Gleditsch, 1996. The negative manifestations include: increased insecurity, more vulnerability, frustration, hardship, and loss of livelihoods, alienation from land or social networks, and conflict. Positive manifestations include: improvements to confidence, social capital, and livelihoods, and better adaptability. It is important to stress that impacts may be beneficial and offer opportunities, not all are negative. It may take SIA to spot and flag such opportunities. Social impacts may occur without a planned development taking place, through ongoing change, such as: demographic shifts, altered tastes and fashions, unexpected disasters, and so forth. A given change can cause different impacts on various groups or among individuals within groups. For the same group or individual a similar change may cause different effects with passing time. Assessment may identify *outcomes* as well as impacts. For example, a development may cause learning or networking with little obvious effect (an outcome), which can mean similar events in the future, would be dealt with in a different way (Vanclay, 2002).

A development or environmental change can cause social impacts that contribute to conflict in a negative or positive manner (MacKay, 1981; Porter and Ganapin, 1988; Homer-Dixon, 1991; Baechler, 1998). Conflict can cause social impacts that affect the developer or the environment. The developer can cause environmental impacts, which contribute to conflict. Added to all that, there may be positive or negative feedbacks. As in EIA one can subdivide impacts into first-, second-, third-order, and so on. A first-order impact is a simple and relatively apparent relationship. Second-order impacts involve a two-step indirect causation, and so may be less obvious, and so on as the order-rises. Devising SIA methods for identifying first-order impacts is relatively easy; however, they are like weak dip-beam headlights, providing a broad close view, but failing to show things further away in the darkness. There is a risk if SIA assesses only first-order impacts those commissioning the assessment will get a false sense of security. Things are in reality even more difficult; indirect impacts may form often complex chains and webs of causation, whereby wholly unrelated impacts interact at some distant point in time and/or space in a significant manner (Slootweg et al., 2001; Taylor et al., 2004). Such chains of causation can be modelled, but it demands time, funds and expertise, and it is unlikely to be precise. Worse, human behaviour can be fickle and difficult to forecast (Barrow, 2000, 2002). There is also a need to exercise caution to avoid environmental determinism: environmental change or disaster do not invariably cause stress leading to conflict, there can be quite the opposite effect, or little change.

There is the potential for conflicts to arise between stakeholders involved in natural resources development or impacted by environmental change or disaster. A *stakeholder* may be defined as someone (it could also be an organism or local environment) that is affected or perceives they could be affected by something. The effect could be either positive or negative, and 'stakeholder' also includes those affected but unaware of it (including people in the future or off-site, possibly far away). In the early stages of an SIA stakeholders need to be identified and understood as accurately as possible. Complex multi-stakeholder situations with overlapping interests are common.

Sustainable development demands trade-offs and conflict resolution between present and future stakeholders. The latter are not able to voice their opinions so a proxy must represent them; SIA could be used to help identify such situations. Just as the 1969 US National Environmental Policy Act required EIAs to stress irreversible impacts it is desirable for SIAs to flag potential and actual sustainable development conflicts. SIA could be used more to supervise and help strengthen the social dimensions of sustainable development and to try to anticipate disruptive conflicts (Cramer et al., 2004).

SIA and social assessment are essentially the same. A technocratic-action orientation to SIA is typically adopted by government agencies. This approach is also commonly used by a range of public agencies seeking to meet legal requirements associated with EIA and natural resource planning and management, and by many private sector developers and consultants (Fig. 1). One can debate what is the best approach; each practitioner has their own ideology and set of experiences. Some favour a technocratic 'top-down' and others a more participatory 'bottom-up' strategy. There may also be conflicts between 'applied' or 'commissioned' research and 'academic' research. The former tends to have more practical objectives, while academic studies are shaped by a theoretical approach and may aim more for publishable results. For further details see Taylor et al. (2004: 27–29).

SIA, hazard assessment, technology assessment, and health impact assessment, often share weaknesses: a need for more standardised approaches; they usually present a 'snapshot' view; and often there are problems communicating between the different specialists and teams.

2.2. Conflict

A few people, even one, can cause serious conflict (e.g. Hitler, Stalin, and present day terrorist groups). Persson (2006) reported one USA animal liberation front (a handful of activists) caused US$18 million damage to property in 2002 alone. Conflict may arise over changes to the environment that is natural, caused by humans, or a combination of both. Social conflict may affect access to resources or the way the environment is used (Lockie et al., 2009; Thiranagama, 2009). Conflict can be generated by exploitation of resources and by people trying to adapt to environmental change, especially if they become eco-refugees. Sometimes conflicts appear at more than one level or locality or time and are in some way related (nested together). In spite of such diversity and complexity can causes, types of conflict and phase of evolution be identified fast and reliably enough to enable proactive conflict-aware SIA?

Studies of environmental and natural resources-related social conflicts have been undertaken by environmental conflict studies, PCIA, ECR, ECM, community psychology, economists, political economists, peace studies researchers, anthropologists, sociologists, economic geographers, etc. There have been attempts to model conflict development (Meissen and Cipriani, 1984; Fiaschi, 2008; http://www.uvm.edu/~shali/ecr.html accessed February, 2009). Overall, there is plenty of hindsight knowledge on conflict causation and progression.

This indicates conflicts tend to relate to one or more of the following:

- overuse of resources;
- access to resources;
- pollution;
- damage to environmental quality (e.g. pollution, overexploitation, overcrowding);
- differences in ethical and religious beliefs;
- simple scarcity;
- problems due to group identity;
- friction caused through deprivation of lower status groups.

The following are also possible causes of conflict:

- ☐ environmental changes (such as global warming);
- ☐ ethno-political differences;
- ☐ centre-periphery relationships;
- ☐ migration/displacement;
- ☐ demographic pressure;
- ☐ shared resources.

So, a body charged with conflict-aware SIA might watch for such situations.

The International Environmental Law Research Centre has published a typology of environmental conflicts, and explored environment-conflict linkages and causation (http://www.ielrc.org/activities/presentation_0410.htm accessed December 2007). Studies by the World Bank suggest that countries most likely to suffer conflict are those heavily dependent on natural resources, and it concluded conflict-aware impact

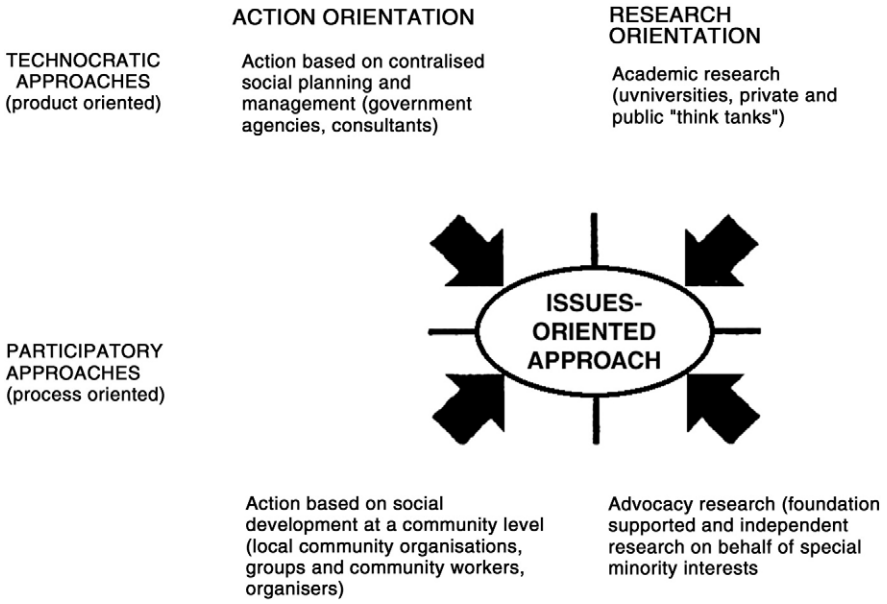

Fig. 1. Orientation to social assessment. Based on Taylor et al., 2004 Fig. 2.1 p.27.

assessment was desirable (Bannon and Collier, 2003: 259–263). Caution should be exercised because, while there is much written on environmental conflict causation, it is not adequately understood (Gleditsch and Diehl, 2001; Spillmann and Bächer, 2005).

PCIA is widely used but so far has not focused much on prediction and avoidance; efforts have been mainly directed to retro-assessing causation and on consensus building and reconciliation *after* a dispute has peaked or hostilities have ended (CIDA, 2004; CPR Network, 2005; Schmelzle, 2005; MacSweeney, 2008). PCIA has largely grown out of conflict mediation/resolution and conflict management since the 1970s. Often a neutral mutually accepted mediator is briefed to help to bring sides to agreement (rather like the *ombudsman* role in Sweden). There is no single overall PCIA approach; rather, most assessment is conducted on a case-by-case basis (Susskind and Thomas-Larmer, 2007).

PCIA, social psychologists and sociologists have recognised the following causes and phases:

- *Structural or root causes* – factors resulting from the structure and fabric of society and policies. These create the preconditions for conflict.
- *Proximate causes* – factors that are symptomatic of structural causes or precede/lead to escalation.
- *Triggers* – single events or series of events, or the anticipation of something, which sets-off conflict.

Thus, it is recognised that conflicts do evolve and may have recognisable thresholds and phases. Fig. 2 (redrawn with modifications from Kumar Rupesinghe, 1998) illustrates several phases of violent conflict. So, if there are thresholds and phases that can be recognised there are opportunities for proactive assessment. SIA will need to quickly identify conflict phases and the causes of stress; it may then be possible to assess how conflict is likely to unfold.

Caution should be exercised, because different types of conflict may overlap and not be clear-cut, also conflicts may vary in the way they evolve from theoretical patterns. Persson (2006) proposed a two-part subdivision of environmental conflicts. Firstly *value conflicts*, in which all parties feel they are right and are unlikely to negotiate. For example, a current value conflict between supporters of genetically modified organisms (GMOs) and their opponents. The outcome of a decision to either allow or prevent further introductions of GMOs into the environment and economy may have serious impacts. The opposing sides have very different perceptions and in some cases opponents to GMOs even turn to terrorism. Second, *conflicts of interest*, these Persson argued, were easier to mediate because trade-offs are possible without altering deeply held views. Manring et al. (1990: 255) also subdivided conflict into two. Firstly they recognised *crosscutting conflicts* – differences on a limited number of fronts, possibly with individuals in opposing groups sharing some similar interests. There is less likelihood of withdrawal into total opposition and more hope of successful negotiation than in a value conflict. Secondly, *overlapping conflicts* – stakeholders share little and tend to oppose their counterparts on virtually everything, consequently with little common ground, agreements are more difficult to achieve. (A reviewer of this paper noted that the Manring et al., taxonomy might link into the social capital literature which distinguishes 'bridging social capital' and 'bonding social capital').

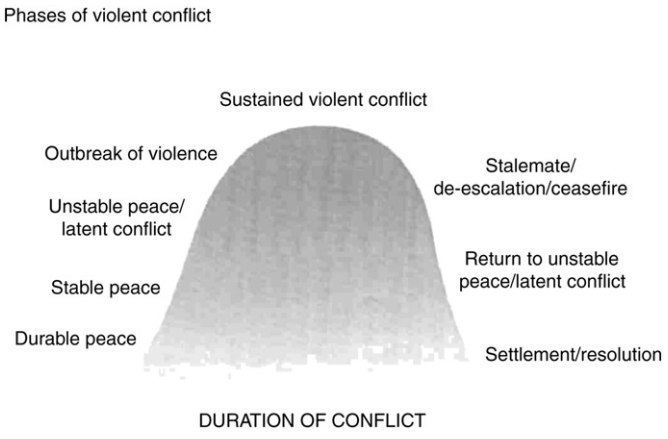

Fig. 2. Phases of violent conflict.

Conflict may arise through one or a combination of:

- Emotional anger caused by jealousy, injured pride, insult, and so on.
- Imbalances in power relations.
- Inequitable distribution of resources.
- Fear, aggression, or indifference to others.
- Relocation as a consequence of natural disaster, social or economic forces.
- Habit: caused by not especially conscious thought, but by misunderstanding, prejudice or traditional views.
- Worldview; for example, religious beliefs, morals, or political outlook.
- Conscious reasoning: caused by rational thought (value beliefs).
- Opportunism: means to ends with the focus on a goal, which is often profit.

Policy and governance may trigger conflict; for example, a subsidy to selected groups may cause some users to over exploit and/or others to be jealous. Stakeholders may try to gain advantage through opportunism if they feel able to get away unobserved or if enforcement is inadequate.

In some situations conflict may upset the status quo and enable or encourage change (beneficial or damaging). The tension between conflicting parties might be used constructively: statesmen often practice 'divide and rule'; and NASA made use of Cold War rivalry to help spur development of its moon landing programme. SIA might help identify such opportunities. An example of a conflict situation leading to improvements in livelihoods and environmental management can be found in parts of the Sudan where males have migrated, leaving female heads of household. These female-headed households face a male-dominated society, yet in spite of conflict, have proved resilient and more innovative: improving family welfare, food security, and land use. Yet, in some other parts of Africa, male outmigration has resulted in family breakdown, loss of social capital, environmental degradation and deprivation. Subtle differences determine how societies change in vulnerability and resilience. Conflict-aware SIA might thus be usefully combined with assessment of the state of social capital (Buchan, 2003).

Conflict between individuals, between groups, between group(s) and 'outsiders' (central government, business, etc.), or between nations, may be a sign of effort to adapt to a challenge (environmental, social, economic, technical, political or combinations of these) (Warner, 2000). There are studies of how conflicts evolve which could be explored to help identify patterns and thresholds for SIA to work with (for example: Coy and Woehrle, 2000). Nevertheless, some conflicts arise where there are no challenges apparent. Developments can both counter or cause conflict. Sometimes a minority causes conflict, sometimes a majority group; it could be due to confident people or nervous people. Prediction of conflict evolution is unlikely to be precise and reliable; but even so, it would be valuable.

2.3. Established conflict impact assessment

PCIA is used by business, national governments, non-governmental organisations (NGOs) and aid agencies to develop appropriate strategies in country and, where refugees have settled; however, it is mainly reactive, not proactive (Austin et al., 2003; http://www.london.gov.uk/mayor/refugees/docs/destitution_by_design.pdf accessed November 2007; Broadwood and Sugden, 2008). Some sectors have generated considerable hindsight knowledge about

social impacts, including conflict: large-scale mining, large dams (especially reservoir-related resettlement), irrigation projects, urban development, oil exploitation, logging, tourism development, road and rail building, creation of conservation areas, shopping mall provision, and (in Australia) casino development (Okoji, 2002; IPIECA, 2004). An increasing number of developers and governments have been adopting conflict management strategies (Ivanova et al., 2007). It should also be noted that the expanding fields of human vulnerability and adaptation studies overlap with conflict management. Human efforts to adapt to environmental or socio-economic change can sometimes cause marginalisation and the breakdown of established coping strategies. Some of the research on breakdown of established coping strategies might usefully feed into conflict-aware SIA. Studies in the USA and Europe of urban gentrification have included conflict-aware SIA. Businesses increasingly use PCIA to support their efforts to practice corporate social responsibility and to reduce costly and image-damaging disputes (Hoffman, 2007). The NGO International Alert has explored extractive industry-related conflict assessment in some depth, focusing on pre-existing social conflict (International Alert, 2006). Companies, NGOs, agencies and governments are keen to assess their operations in a proactive way to aid planning, reduce corruption, defuse opposition and inter-group conflict, anticipate human rights and resource access problems, and to improve benefit distribution. More proactive PCIA drawing on conflict-aware SIA would be welcomed (Daudelin, 1999; Berger, 2002; International Alert, 2006; Chandrasekara, undated; http://www.mazda.com/csr/environment accessed November 2007). ECR and ECM are also reactive, rather than proactive but do provide information on how conflicts evolve (Nath et al., 1998: 436–456; O'Leary and Bingham, 2003). The UNEP (2004: 38–47) has explored proactive conflict-aware SIA; but seems to have done little since then. Another exploration of proactive PCIA was provided by Carment and Schnabel (2004: 341–414). There is thus a knowledge base for conflict-aware SIA to draw upon.

2.4. Participation, empowerment and conflict avoidance

There is a widely held viewpoint that if stakeholders are encouraged and empowered to participate in planning and management the result is more likely to yield: sustainable results, cause less environmental damage, give better livelihoods, and avoid conflict (Rydin, 2003). Many fields adopt this view, including some SIAs, extractive reserves, participatory development, the sustainable livelihoods approach, and participatory conservation. But making it work can be a challenge: the established route for SIA is to involve representative stakeholders but often the marginalized or minorities are missed. The question should also be asked: how good is the judgement of those stakeholders consulted? SIA is often less about incorporating citizen views into planning and more concerned with legitimising what has been planned, i.e. orchestration of one-way communication to reduce conflict with the developer. There may be countries where participation is not a priority and situations where urgent problems or sensitive issues prompt more draconian ways. Participation or empowerment does not necessarily lead to conflict avoidance. Perhaps conflict-aware SIA should concentrate on assessing stakeholder potential to cause conflict and not get engrossed with ensuring participation or making development plans palatable.

Individuals and groups often differ in the things they value and in perception of opportunities and threats. Faced with the same development, confident people are likely to react differently from the fatalistic, weak and dispirited (but the result can be conflict in either case). A nation with a useful but unsustainable natural resource; for example, petroleum or groundwater has a choice: spend the benefits on short-term social welfare (and votes), or invest in long-term, hopefully sustainable, development (which may be unattractive to the electorate). Citizens and government can come into conflict over such decisions. Pursuit of sustainable development is not a costless strategy it can cause intergenerational conflict. SIA may therefore need to maintain some distance from those currently involved in development and identify ways to help represent the future in the present; not least because politicians and public servants are pressured to satisfy present demands.

3. SIA for environmental and resource development-related conflict management

ECM and political economy researchers have explored environmental conflicts in considerable depth (Modavi, 1991; Percival, 1992; Anon, 2000). But, the theory of environmental conflict is far from firmly established, particularly whether environmental changes commonly induce conflict, and if so how? Manring et al. (1990) explored the potential for linking SIA and ECM; they concluded that these two fields could work together, although they noted at that time that it had rarely happened. Their conclusion was that SIA could preemptively predict problems for ECM with (and presumably that would also be true of fields like PCIA). They were satisfied that SIA should be able to identify thresholds and help monitor and uncover causes of antagonism and posturing. Manring et al. (1990: 254) also felt that the social systems approach often adopted by SIA did little to support conflict management. Lockie (2007) argued for SIA to use deliberation theory and actor-networks to go beyond exploring social change to target consensus building among stakeholders; emphasise how values and perceptions change as development proceeds; help unravel what is crucial; and foster engagement between specialist and lay knowledge.

In some countries SIA is part of the regional or urban planning process and does explore conflict; issues focussed impact assessment also often deals with conflicts (Harrison and McDonald, 2003; Heikkinen and Sairinen, 2007; Jyväskylä, 2007; Wells et al., 2007). The spread of strategic environmental assessment (SEA) may offer opportunities for incorporating conflict-aware SIA in a way that enables it to seek out where it is needed early enough to support proactive governance and planning. Conflict management demands a proactive approach to give an opportunity to resolve differences and reach agreed solutions. It is also likely to require a neutral, respected SIA assessor and mediator with adequate 'teeth'.

Monitoring for situations where conflict-aware SIA should be applied might be made easier if it were applied using a manageable-sized bioregion. Bradshaw et al. (2001: 13) suggested a tiered methodology in their study of SIA applied to fisheries "stepping down through geographic scales and employing a range of methods, sources and techniques". New Zealand's Resource Management Act (1991) includes provision for environmental dispute resolution measures in the decision-making framework, but the focus of is not really on proactive assessment. Australia uses SIA for urban and regional planning with some consideration of conflicts, particularly as part of the quest for sustainable development and to help protect the rights of Aboriginal peoples (Rolf and Windle, 2003). In the UK several new town proposals have prompted SIA focused on conflict management; for example, existing communities around a possible development sited at Sherford (close to Plymouth) became aware and expressed concern, which triggered studies by the developers http://www.scotwilson.com/betasite/projects/property/education/sherford_ne (accessed November 2007). In cases like this conflict-aware SIA seems to be more a tool for 'value added', i.e. helping developers enhance achievements, rather than as a proactive means of shaping development. There is thus some risk that SIA may be used to support the interests of partisan sponsors and consequently inadequately explore the opportunity costs of developments and their alternatives (this was noted long ago by McDonald, 1990).

With any development a few dominant voices tend to be heeded (Boyle, 1998). These can be special interest groups, a business, government officials, or a powerful individual, and may lead to

unsuitable decisions. There may also be problems when middle-class urban people make decisions affecting mainly rural folk and the poor because they are ill-informed or lack sympathy (Cernea, 1991; Chambers, 1997). SIA originated in western nations, so applying it in other countries, especially those socially, culturally and politically different, still poses challenges. Also, people may not be keen to participate (Tang Bo-sin et al., 2008), there may be limited funding for SIA, or a rush to develop or do something for strategic reasons.

Indigenous peoples have acquired rights and powers in many countries and may inhabit areas and rich natural resources. They can differ markedly from other groups in the ways they value natural features and resources so conflicts are often generated (O'Reilly and Eacott, 1999). SIA has been used in environmental and natural resources development conflicts between indigenous peoples and others in Australia, New Zealand, New Guinea, Canada, Finland, Alaska, Australia, the USA, South America, and several other countries, to clarify vulnerabilities and try to reduce impacts and conflicts. Mostly this has been done late: in-conflict or post-conflict, but there are signs of change (Rickson et al., 1989; O'Faircheallaigh, 1999; Lane et al., 2003; Roon, 2006).

3.1. Social Impact Assessment focused on social capital

Social capital may be defined as the networks of association and organisation at community level. It is the value gained from being part of a community, group, or institution achieved through informal and organised reciprocal networks of trust, obligation, and friendship, which together contribute to social organisation. It is the 'glue' that holds society together in a stable manner and it provides support to facilitate adaptation to adversity and innovation (Falk and Kirkpatrick, 2000). Social capital may support conflict resolution or help a stubborn group resist reconciliation. The networks can be horizontal: between family, friends, neighbourhood, community, culture, etc. And, they can be vertical: for example, access to resources through NGOs, government bodies, international agencies, political parties, etc. Social capital plays an important part in conflict and should be monitored. Williamson (2002) went further and suggested developers negotiate with community representatives and contract to develop social capital, and in return citizens would agree to support the development.

SIA could be a useful tool for warning of erosion of social capital, for identifying and recommending ways of building up social capital, and for identifying how to use it to support the quest for sustainable development. A number of local, regional and national investment programmes claim to have adopted proactive use of SIA, focusing on prediction of threats to or improvements in social capital (Sander, 1997; Anirudh and Shrader, 1999; Kingsley and Melkers, 1999; McGregor et al., 2000; Putnam, 2000; Chase, 2002; Randolph, 2004: 54–59). Business has also shown interest in assessing social capital, especially if community-based projects or programmes are involved (Grootaert and van Bastelaer, 2002). Subtle factors can affect social capital, including media, fashions, Internet access, and much more (Gaved and Andeson, 2006). So, making predictions about social capital is challenging, not least, because it has not been sufficiently established what strengthens and weakens it and it is difficult to measure.

3.2. Environmental and natural resource development-related impacts on stakeholders

Much of the SIA literature is focused on the impacts of development on local stakeholders. But it is not uncommon for development to impact on distant stakeholders (spatially and/or temporally). Some groups may be more prone to conflict: for example, people who are suspicious of outsiders; those habitually squabbling; those previously disrupted; those with a culture that hinders adaptation. Conflict generated when people are forced or encouraged to move impacts on the relocated and host population. The causes of relocation can include less than obvious gradual attitudinal changes. Poverty may play a role in conflict, poor people may find it difficult to maintain good environmental management and have little chance to adapt to or correct problems, withstand disasters, or innovate. If the causes, dynamics and impacts of poverty are established and monitored aid might be provided more effectively (http://www.worldbank.org/wbsite/external/topics/extpoverty/ex accessed November 2007). There are situations where local people damage the environment or natural resources through greed or traditions that hinder governance; it is also common for peoples in remote areas to be unfairly blamed without adequate efforts to assess root causes.

Conservation efforts can generate conflicts. Jackson et al. (2001) used SIA to explore conflicts between several stakeholders making multiple use of a wetland environment in Norfolk (UK). This greatly clarified causation but took place too late to enable proactive management and was a research study with no enforcement powers. In Australia saltwater crocodile conservation is blamed for more frequent human attacks so some stakeholders are unhappy (Axelrod, 1994). Similar conflicts occur in Florida (USA) over alligator conservation, in Scandinavia moose protection may mean more motor accidents, and lands around African game reserves suffer damage from elephants and people fear large land predators. Water is a crucial natural resource, which is widely seen to be coming under stress through rising population, poor management and global environmental change, together with growing demand. Because the resource is so vital, and sometimes has religious value, competition for it may lead to conflict. Rivers are frequently subject to different uses by a range of stakeholders and satisfactory sharing is not simply a matter of distributing a portion of available supplies, the usage must be integrated and seek to minimise conflict.

Social changes can gradually and often imperceptibly alter environmental and natural resources management. People can adopt seemingly minor innovations, such as nylon-line, cool boxes, outboard motors, skidoos, or mobile phones and the resulting impact on established resource use can be considerable. Allied with such changes there may be subtle breakdowns of traditional attitudes. For example, in Amazonia taboos against fishing in areas that acted as refuges prevented overexploitation, but social change has weakened these restrictions with serious impacts on sustainability and has caused friction between stakeholders. SIA might warn of such change before it progresses too far. The problems in doing this, apart from developing techniques, are: how to decide when conflict-aware SIA should be used and how to pay for doing it?

3.3. International environmental and natural resources development conflicts

World population is growing, an increasing proportion of people seek better standards of living, there is a likelihood of global environmental change, many natural resources are being degraded and legal safeguards evolve slowly. So, transnational and global conflict situations look likely to multiply. These conflicts are often about 'global commons' which are not under individual ownership or even national sovereignty and legislative controls tend to be weak. Overlapping territorial claims to areas rich in natural resources in the Arctic and Antarctica and their surrounding oceans have the potential to cause conflict as environmental change and technological development makes access easier. Now is the time, before ice melt, to start assessing how conflicts may evolve so that management can be planned and ways to co-operate can be encouraged before incidents develop. International commissions (like The International Whaling Commission) dealing with specific problems, resources or regions are possible platforms for such SIA to work from.

Fig. 3. Recent forest clearance in the Cameron Highlands in an area protected from farmers. It has been undertaken through a 'joint venture' between farmers and indigenous hunter-gatherers who are exempted from land use controls because they have traditional rights. Established enforcement either missed these clearances or they were seen as beneficial for the indigenous people.

4. SIA methods for proactive environmental and natural resources-related conflict assessment

It is possible to list useful inputs for proactive conflict-aware SIA:

- ❑ Look for early-warning signs of conflict.
- ❑ Establish deadlines for the SIA (the time available).
- ❑ List and study stakeholders.
- ❑ Identify relationships between stakeholders.
- ❑ Establish the history of any apparent conflict.
- ❑ Research the progress of similar conflicts (use of hindsight knowledge to help recognise thresholds and phases).
- ❑ Map areas of agreement and disagreement (in a stakeholder group there may be a range of views).
- ❑ Look for opportunities.

Desk research on environmental and natural resource development-related conflicts can help expose relevant legislation, collect case studies and information on how to mitigate and turn conflict situations into opportunities. These studies can be used to help to draw up checklists for conflict-aware SIA, but, alone are insufficient and should be supplemented with local field studies and perhaps modelling. A simple and quick Leopold-type matrix of tensions and conflicts against vulnerable environmental and social factors could be constructed to indicate direct (first-order) impacts. However, that is a crude tool and it would be desirable to conduct further assessment of indirect and cumulative impacts. Whatever methods are adopted, one question is: can pre-conflict SIA be effectively conducted without triggering or exacerbating existing conflicts?

Water resource development lessons suggest that conflict avoidance or reduction should be transparent, build long-term trust and dialogue among key parties, promote trust and dialogue among relevant stakeholders, and seek to support conflict resolution networks and water stakeholder or user groups. The aforementioned source notes the relative abundance of work on water disputes between states and fewer assessments of conflicts within states, yet the latter are more common. Conflict-aware SIA may be able to draw on water disputes experience to better develop approaches.

PCIA has used brainstorming workshops composed of selected experts and stakeholders (Besançon, 2005). Similar brainstorming might be suitable for conflict-aware SIA, at least as a starting point. This might also be a practical way to identify when and where SIA is needed. A more-ordered and controlled form of brainstorming is the Delphi technique, which is useful in complex situations where the data input is relatively patchy and the aim is relatively inaccurate longer range forecasting. Another possible tool is the self-assessment checklist issued to selected stakeholders. Focus groups, stakeholder analysis, and conflict mapping could be used to assess objectives, social dynamics and power relations. Manring et al. (1990: 259) explored what SIA approach and methods would best suit conflict management ends; they felt technical (impact assessment as technical analysis) and socio-political approaches were both useful. Lane et al. (2003: 91) came to a similar conclusion after researching development-Aboriginal people conflicts in northern Australia. They suggested that SIA should use technical methods along with more community-focused approaches to pick up subtle local issues. Conflict-aware SIA might also usefully borrow from adaptive environmental assessment and management (AEAM) (Gilmour and Walkerden, 1993).

SIA and sustainable development are often best pursued at a manageable project, community, sector, or regional level where there is some sense of 'context of place' (Hill et al., 2007: 197; Broadwood and Sugden, 2008). There are many ways to define a region: for example,

through physical or cultural boundaries, sense of community, historical limits, areas of cultural cohesion/regional identity, catchments for service industries, transport networks, situations where a set of resources are used, etc. The important qualities for conflict management and sustainable development would be a unit that is not ephemeral and is clearly delineated. The domain of governance structures should match in spatial terms and function the natural resource system it is proposed to develop: for example: a river basin, or sub basin wholly within the jurisdiction of a governing authority. It is important that social and political systems are also aligned with biophysical systems to improve the chances of resolving natural resources-related conflicts. River basins or sub-basins are bioregions that have been widely used for integrated and holistic planning and management and have a clear region-wide theme: water development. Another potentially useful approach, developed in Brazil, is the extractive reserve. This is a smallish regional unit to cater for integrated management of complex and often conflicting human demands from a number of stakeholders on areas of forest or marine environments, defined for the purpose of promoting sustainable development. Even in small regions there will usually be a number of overlapping communities to assess, each with a number of stakeholders.

In the Cameron Highlands (Malaysia) about 2600 smallholders intensively farm an upland area of about 715 km². Wishing to avoid forest clearance and the pollution of streams through soil erosion and with agro-chemicals, the Malaysian Government has controlled land use by issuing a limited number of Temporary Occupation Licenses (TOLs) each year. This virtually stopped deforestation and led to a pool of landholdings and a 'survival of the fittest' situation that resulted in intensification and improvement of land husbandry with little abandonment and no clearance from the early 1980s. However, around 2004 a few entrepreneurs found loopholes in the legislation to restart forest clearance through 'joint ventures' with indigenous people or cleared plots in less regulated highlands some 30 km away (Fig. 3). The clearances cause conflicts between local stakeholders and cause serious environmental impacts (Barrow et al., 2008). Aerial remote sensing shows the deforestation extent but not its causation. Proactive SIA might have established causation and given a chance for avoidance of clearance before irreversible damage was done and conflict arose.

5. Conclusions

SIA combined with vigilance appears to have potential as a tool for understanding conflicts early enough to allow more proactive management. PCIA, ECR, and ECM mainly focus on conflicts that are well underway or, more often, on post-conflict situations. Conflict-aware SIA will need to apply available (and possibly develop new) rapid assessment tools. Research on conflicts indicates they often develop through phases and show thresholds, which could be useful for SIA. The complexity of conflict situations means that the SIA may not be precise so care must be taken to ensure that it does not give false messages. One challenge is to decide when and where conflict-aware SIA should be initiated; some sort of ongoing monitoring is desirable to flag cases for attention.

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