

Transitioning from theory to practice in sustainable development governance

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Abstract: The main components of sustainable development and governance are examined and expanded upon in this study, taking into account their interrelationships as they have arisen from the fundamental topics in sustainable development discourses during the last fifteen years. We contend that the best way to understand sustainability is as a socially constructed process of adaptive change, where innovation is an essential component. We go over four essential components of sustainable governance that are included into the idea of transition management. The end product is a conceptual framework for decision-making and action with the goal of advancing sustainability.

Keywords: trade-offs, sustainable development, innovation, and governance.

Introduction

Sustainable development and governance have a common ancestor. With similar traits and overlapping possibilities, they first appeared in the late 1980s. By the mid-1990s, there was a resurgence of interest in the role of institutions in social transformation, and these concepts were often used in both professional and popular discourse. Neither of these words is yet well-defined or mature. The overlaps between their broader meanings are still little understood, which may be more significant. Because the words' definitions and connotations provide various promises and dangers to both new and old power-holders, they are still debated and will remain so for some time.

We shall provide a perspective on sustainability and look at its governance elements in this paper 1. We shall contend that the best way to understand sustainability is as a socially constructed process of adaptive change, where innovation is an essential component. We go over four essential components of sustainable governance that are included into the idea of transition management. The transition management model, which is now in use in the Netherlands, is offered as a useful and appealing model for policy, demonstrating that society may achieve sustainability.

Sustainable development

The idea of sustainable development originated from two main sources: the increasingly concerning evidence of ecological degradation and other biophysical damage, both in spite of and as a result of the greater resources made available by economic growth, and the generally unsatisfactory record of post-World War II "development" efforts, particularly the persistence and, in some cases, worsening of poverty and desperation during a time of enormous global increases in material wealth. Before designating the World Commission on Environment and Development (WCED) to handle these issues collectively, the United Nations and related organisations concerned about them independently for a few decades. The Commission came to

the conclusion that social and ecological problems had similar origins and required a shared solution. Following the publication and subsequent adoption of Agenda 21, the Rio Declaration on Environment and Development, and the Statement of Principles for the Sustainable Management of Forests by more than 178 governments at the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro, Brazil, in June 1992, a wave of interest in, discussion about, and experimentation with sustainable development was sparked by its final report, *Our Common Future* (WCED, 1987).

The concept of sustainable development has been broadly, if ambiguously, adopted by a wide range of organisations worldwide in the more than 20 years since the release of *Our Common Future*. The concept's ramifications and meaning have been hotly debated, and entities that have professed to be devoted to it have been criticised for their actual actions. But throughout time, certain fundamentals have emerged.

Current paths of development are not sustainable

The resource-intensive growth patterns of today are eventually unsustainable from an ecological and financial standpoint. Inadequate consumer and worker protection, poverty, and marginalisation are further issues. While many value enhancements, including significant increases in environmental quality, have been brought about by contemporary economic advancements, few of these benefits have been automatic, and the overall effects still include ongoing development failures and worsening ecological degradation.

Sustainability is about protection and creation

Sustainability is often thought of as protecting amenities, such as cultural variety, but it also refers to ongoing progress or creation—a better, more equitable society. Innovation in governance institutions and socio-technical systems is necessary for both the preservation existing amenities and the development of new and improved services for more people. The negative consequences of certain trade-offs presented by current technology may be mitigated by innovation. However, there are drawbacks to innovation, including hazards that need to be considered and addressed.

Requirements of sustainability are multiple and interconnected

Maintaining the integrity of biophysical systems, providing better services for a larger number of people, and eliminating hunger, annoyance, and deprivation are the primary aspects. Choice, opportunity, and access to decision-making—aspects of equality both within and across generations—may be added to these. Similar to the people-profit-planet model, the economist capital model of sustainable development—described in the works of Pearce, Atkinson, and others, such as Pearce et al. (1989)—misses out on a number of aspects and ignores the linkages. According to Gibson (2001), sustainability is about intermediate and long-term integration, which is the simultaneous pursuit of all sustainability objectives in order to achieve mutually beneficial outcomes.

Pursuit of sustainability hinges on integration

Sustainable development is fundamentally about the successful integration of social, economic, and ecological aspects at all sizes, from local to global, over the long term, due to the interdependencies among its variables and goals (Schnurr and Holtz, 1998). Sacrifices and compromises are inevitable. It is realistic to anticipate that the majority of short-term projects will be very flawed given the gap between present conventional practice and possibly sustainable conduct. However, the goal is to acknowledge the interconnected significance of social, economic, and ecological imperatives and to identify solutions to support each of them. Fair treatment of each component is not the goal; rather, decisions that permanently improve the entire are.

Sustainable development was often portrayed in early literature as the growth of the region where social, economic, and ecological quality rings overlapped. These illustrations were helpful in highlighting the connections between desired social, economic, and ecological attributes and in showing that a large portion of our present activities fall beyond the scope of

possible sustainability. However, it was difficult to resist the inclination to think about social, ecological, and economic aspects independently, even in cases when their importance were acknowledged.

Similar problems beset the 'pillars' based approaches adopted in much of the sustainability literature and in many implementation efforts (Mebratu, 1998). Most often, three pillars – social, economic and ecological – are identified, though culture and politics are sometimes recognised as additional distinct categories (e.g., CIDA, 1997). Important work has also been done in exploring the concepts of social, ecological and economic capital for sustainability, with particular interest in the existence and limits of potential substitutions (Berkes and Folke 1993; Daly, 1996; Dixon and Hamilton, 1996; Costanza et al., 1997). In practical applications however, the pillar-focused approaches have suffered from insufficient attention to overlaps and interdependencies and a tendency to facilitate continued separation of social, economic and ecological analyses. Alternative depictions stressing interconnections and consideration of institutional aspects (as in the PRISM model, see the preface to this special issue and Spangenberg (2002)) offer a useful way forward.

Core requirements and general rules must be accompanied by context specific elaborations

The context always plays a major role in determining what is most necessary, suitable, and feasible. People who will have to live with the outcomes must be involved in the thorough development of sustainability standards and the selection of suitable processes for accepting or rejecting solutions and trade-offs. The benefit is that strategies that acknowledge local uniqueness may mobilise and promote local expertise, increasing awareness of and dedication to sustainability goals. Sustainability might be defined as locally appropriate, internationally sustainable solutions. However, local understanding and conduct that aligns with the broader purpose are equally important. According to Rosenau (2003), localism and globalism are likely to clash due to their divergent perspectives and action logics. As the debate over globalisation demonstrates, the contradictions are hard to resolve.

Diversity is necessary

The importance of context means not only that there are different good answers for different situations, but also that there are many different ways of designing and strengthening the various foundations and practices of governance to respect the principles of sustainability. While this can be administratively inconvenient, diversity offers positive benefits for sustainable development. Diversity is a source of learning and the fuel of evolution. It is important to safeguard diversity in all dimensions, including socio-cultural, economic and technological. Diversity is a source of learning and a resource base for adaptation and reorganisation (Lister and Kay 2000; Kay and Schneider 1994; Rammel and van den Bergh, 2003). Diversity in product offerings is also needed for meeting heterogeneous preferences and local circumstances.

Surprise is inevitable

Precaution is one of the core requirements for sustainability because there will be surprises. Sustainable development is pursued in a world of multi-dimensional, intersecting and dynamic complex systems. We cannot expect to describe them fully, much less predict future effects. We may lack even suggestive evidence about many emerging problems, whose influences will ripple unpredictably through complex socio-ecological systems. Sustainability calls for prudence and adaptability, preferring safe-fail over fail-safe technologies, seeking broadly comprehensible options rather than those that are dependent on specialised expertise, ensuring the availability and practicality of backup alternatives, and establishing mechanisms for effective monitoring and response (Gibson, 2001, p.19).²

Transparency and public engagement are key characteristics of decision making for sustainability

The importance of context, the benefits of diversity and the inevitability of surprise all suggest that transparency and active public engagement are necessary qualities of governance for

sustainability. Openness and participation are favoured by the emphasis of sustainability on lively citizenship, which is seen not just as a means of building understanding and commitment, but also as an end in itself – an aspect of the necessary and richer alternatives to lives centred on material consumption.

Explicit rules and processes are needed for decisions about trade-offs and compromises

Seeking constructive, mutually beneficial improvements across the board is the goal of sustainability-centered decision-making. However, as this effort progresses, there will be many instances in which no workable solution provides all the necessary advantages. There will always be winners and losers as well as trade-offs between objectives. It is necessary to confront and manage trade-offs. Generally speaking, we may agree, for instance, to make sure that any combination of concessions still results in net overall positive contributions to the essential sustainability needs, or to avoid abandoning a long-term goal in order to gain a temporary advantage (Gibson, 2001).³ Another tactic is compensating losers, although it shouldn't be used in every situation. Damage should be paid for by polluters, not compensation for non-damage. It is undoubtedly beneficial to pay clear and honest attention to the logic behind compromise and trade-off choices. We may endeavour to develop systems that provide a variety of advantages, but it is not a good idea to wait for win-win solutions to appear.

The end is open

The final characteristic with implications for governance is that sustainable development is an open-ended process. It is not usefully conceived as a particular specified or specifiable target. Pursuit of sustainability is a long-term, indeed never-ending process. The notion of sustainable 'landing places' that is sometimes used by the European Commission is therefore misleading. It suggests that the problem of sustainable development can be 'solved' whereas in reality only specific issues can be resolved and managed. There always will be 'problems' and needs for change (Rammel and van den Bergh, 2003; Sartorius, 2003).⁴ Implementing a commitment to sustainable development entails a substantial transition not just to a broader understanding and a more ambitious set of objectives, but also to more coherently interrelated institutional structures and processes of planning, administration, markets, tradition and choice at every scale (Gibson, 2001; Parto and Doloreux, 2003). Clearly, this is not a transition that can be accomplished quickly or easily. The challenge is to show how such a transition can be accomplished and to develop a core set of tools that would make governance for sustainability manageable.

Governance

Similar to sustainable development, the idea of governance was first extensively studied and accepted in the late 1980s. Similar to sustainable development, it was appealing because it included a wide range of elements that were becoming more and more significant but were not adequately acknowledged in traditional thinking. It also promoted a more comprehensive understanding of how these elements were, or ought to be, connected. The political system was seen by governance academics as an unstable, ill-defined combination of official and informal structures. The traditional understanding of governments as formal, distinct, and unchanging organisations stood in stark contrast to this. The concept of governance emphasised the growing significance of both formal and informal arrangements in the political economy, while government conjured up an image of formal organisations dominating over people.

In contrast to governing, which is an act, a deliberate attempt to direct, control, and manage (sectors or facets of) society, governance is seen as a way of social coordination (Kooiman, 1993, p. 2). Deliberation, negotiation, self-regulation, authoritative choice, and the degree to which actors follow group choices are all examples of governance. It includes the degree and extent of political distribution, the state's prevailing direction, and the relationships between various institutions. According to Eden and Hampson (1997), p. 362, governance structures are responsible for organising negotiation processes, determining goals, influencing incentives, setting standards, performing allocation functions, monitoring compliance, enforcing penalties,

initiating and/or reducing conflict, and resolving disputes among players. Power is effectively exercised via a network of interrelated players, each of whom has access to resources, money, and rights.

The notion of governance fits in with complex systems approaches to understanding the workings of the political economy through the inter-relationships among identifiable parts (e.g., social, economic and ecological), rather than just the parts themselves. A complex systems approach to governance also implies explicit appreciation of complexity and uncertainty, likelihood of surprise and need for flexibility and adaptive capacity.

That said, governance has been defined and used in many ways in different contexts. Often the concept is given normative as well as descriptive weight. Sometimes, for example in the OECD's and World Bank's usage, it is adopted to serve the neo-liberal agenda of reducing the role of governments in favour of market mechanisms and corporate interests (OECD, 1995; World Bank, 1992). Often it is presented as a means of serving democratic pluralism – defined as the structured ways and means in which the divergent preferences of inter-dependent actors are translated into policy choices to allocate values, so that the plurality of interests is transformed into coordinated action

and the compliance of actors is achieved (Eising and Kohler-Koch, 2000, p.5). This overlooks the authoritative role of government as seen by its citizens, something that is still very prominent in countries such as Germany and France in Europe and most Asian countries.

Arguably, since the early 1980's, authoritative control of social relations has been increasingly exercised through quasi- and non-government entities rather than just formal governments and government institutions. In several ways, citizens have become more powerful with respect to how governing is exercised (through rights of information and co-determination) and with respect to how business activity is conducted (consumer boycotts). The shift from government to governance spells a change in decision making and numerous opportunities for the pursuit of sustainability. We recognise, however, that despite an ideological shift over the past two decades toward liberalisation, government has remained, and is likely to continue to remain, a powerful actor with a major role in discourses on governance for sustainability. This should not be understood as an argument against citizen involvement or stakeholder engagement, both of which are important for at least four reasons: it enhances the legitimacy of policy, helps to reduce the risk of conflict, offers an additional source of ideas and information; and through their involvement, people and organisations learn about environmental problems (Coenen, 2002).

The most significant challenge is to ensure that multi-player governance regimes embody capacity for sustainability-oriented coordination, direction and re-direction. It is clearly reasonable and appropriate to recognise that business organisations, civil society groups and citizens, as well as formal governments have roles to play and are already important actors. Finding ways to ensure that all these players act coherently, effectively and with some efficiency in the pursuit of sustainability demands much higher ambitions and underlines the crucial role of informal institutions. A variety of tools are available including development of explicit common objectives, targets and indicators; use of multi-stakeholder deliberation and decision mechanisms; and creative application of tax and regulatory instruments to foster cost internalisation and other adjustments to business and consumer behaviour in the market place. But all of these rely, more or less heavily, on a continuing central (and formal) role for governments in coordinating and often initiating action, and in legitimising and entrenching the decisions.

5. Governance for sustainability: key components

Better governance is a prerequisite for, and probably also a product of, steps towards sustainability. Much is expected from 'good governance'. According to the European Commission, good governance consists of openness and participation, accountability, effective

coherence, efficiency (proportionality) and greater sensitivity to the immediate context that is promised by subsidiarity. For sustainability, other requirements include means of internalising external costs and ensuring integration of policy considerations, evaluation of options and dealing with trade-offs. It is worth noting that in the Commission's definition of good governance the emphasis is on the role of institutions as entities that are largely viewed as being 'up there' and, at least currently, insufficiently within the reach of ordinary citizens. As such, this view of governance seems concerned primarily with minimising bureaucratisation and hierarchy. The intent of the White Paper on European Governance (CEC 2001) is to make formal institutions – which are

increasing in size and number – more accessible, accountable, and relevant to the general populace and to retain a higher degree of relevancy, credibility, and legitimacy in the average person's mind. The White Paper's necessary but exclusive focus on formal institutions overlooks the important role played by other, less formal, institutions in European governance, particularly in policy formation and implementation. To fully appreciate the role of institutions, they should not be viewed as synonymous with bureaucracy (Parto, 2005a, 2005b). Because a major portion of sustainable development is ultimately about radical changes in the systems of production and consumption, governance for sustainability is, by implication, about working through formal and informal institutions to bring about societal change.

Effecting change in informal governance institutions, such as habits and routines, requires identifying the levels at which the change is desired, the territorial scale at and through which the desired change is to be implemented, and the systems which are likely to be affected due to the desired change. The challenge will be to find ways of establishing governance regimes that have reasonable coherence of vision and commitment, enjoy trust and are accountable, and have sufficient capacity for coordination, direction and re-direction.

Governance for sustainability has certain key features and components. In the following we identify four of these components and elaborate on some of their main features.

Policy integration

The coordination of government policies with the equivalent and complementary stances and actions of other governance actors is a significant "interrelations" problem. In order to address distinct issues, the contemporary state has evolved toward a greater degree of sectoral specialisation. While specialisation has aided in the development of useful solutions to specific issues, it has also resulted in the disregard of more comprehensive factors and insufficient or harmful partial solutions from the perspective of sustainability. An excellent example would be costly end-of-pipe solutions that shift a pollution issue at the site into a waste issue elsewhere. Policy integration, better communication between governmental and non-governmental organisations, and the development of a longer-term perspective in government are all necessary for sustainability (OECD, 2001, p.11).

Consolidating policies to produce a single integrated policy that addresses everything is not the same as policy integration. Specialised policies are still required (see Hertin and Berkhout, 2002).⁶ Acceptance of shared general goals, coordinated policy option development and selection, and cooperative execution intended for acceptable consistency and, where feasible, positive feedback are key components of effective integration for practical decision making.

The COMPSUS research and the OECD study "Governance for sustainable development" have looked at attempts to integrate environmental policies for a few chosen nations. According to the COMPSUS report, vertical environmental policy integration—that is, policy integration inside the governmental sector—has made far more progress than horizontal environmental policy integration, which is integration across policy sectors. The COMPSUS study's very unfavourable finding is that "the process of intra-ministerial integration has been more formal than substantive." Well. According to Lafferty and Meadowcroft (2001), cited in Lafferty (2002, p. 21), "the quality of the departmental engagement with environmental concerns or the broader

sustainability development agenda is typically weak, even where the intra-ministerial integrative ideal has been more thoroughly pursued, as in Norway or Canada."

This clearly dampens any great optimism. Policy integration is a long and difficult process in which political will is important. Full policy integration may not be achievable but significant gains can be made. Lafferty offers several suggestions for vertical and horizontal policy integration within the environmental realm. For vertical integration he recommends specification of major environmental impacts of policies and activities, establishment of a system of dialogue and consultation, sectoral strategies for change, action plans, budgets and monitoring programmes. For horizontal integration, he proposes use of long-term sustainability strategies for sectoral domains, specific governing bodies entrusted with overall coordination and supervision of the integration process, communication programmes, and national action plans with targets and ongoing programmes for assessment, feedback and revision and conflict resolution procedures.

Common objectives, criteria, trade-off rules and indicators

Experience with environmental and other policy integration initiatives shows that structural solutions (such as the introduction of interministerial committees or new cross-sectoral bodies) may only provide limited results in huge organisations, including national governments. Structural adjustments linked to required reporting and monitoring requirements that impose a sustainability-oriented framework for justification and increase the transparency of institutional activity may provide some further gains.⁷ Effective integration may undoubtedly be facilitated by co-management, advisory round tables, multi-stakeholder decision making, and other processes involving many governance institutions (Berkes et al., 1991; Cormick et al., 1996; Hemmati, 2002; Abaza and Baranzini, 2002; Dorsey, 2004). However, the most of these are only helpful in certain situations or a few high-priority issues. A set of additional process-related tools is required for more widespread use.

Four such instruments are established guidelines for making trade-offs and compromises, agreed long-term goals, clear standards for planning and approving major projects, and publicly recognised indications of the need for action and advancement toward sustainability. Some governing organisations have created and implemented versions of each of these for specific objectives. Coalitions of governing bodies have sometimes even created and embraced them with the goal of achieving wide sustainability. However, there is still a lot of room for broader and more thorough use in governance systems:

Shared sustainability objectives

As we observed at the beginning of this paper, debates about the meaning and implications of sustainable development have now progressed far enough to reveal the essential core requirements for sustainability. This opens the door to reasonably clear specification of related objectives for particular regions, nations and localities. Sustainability-centred objective setting processes, involving multiple governance institutions, have already been used, with some good results, in many jurisdictions (e.g., Devuyst, 2001; Köhn et al., 2001; Vaidyanathan, 2002). Perhaps the most common

and practically influential examples have been those of cities and urban regions that have developed new or revised land-use plans through processes including collective development and review of future scenarios and public debate on planning goals and alternatives (Boyle et al., 2004). But larger scale versions are certainly possible.

Sustainability-based criteria for planning and approval of significant undertakings

Proponents of significant public and private sector projects are increasingly often subject to environmental assessment or planning permission requirements from national, provincial/state, and even local governments. In instance, environmental evaluation is often used both at the level of physical projects and at the strategic level of plans, strategies, and programs. The evaluations include a wide range of topics in different jurisdictions, with the term

"environment" being interpreted to encompass social, economic, and cultural elements as well as biophysical elements and their interactions. Additionally, the test of approval in an increasing number of circumstances is an obligation to demonstrate that the proposed activity is the most desired of the possibly acceptable possibilities and would contribute positively to sustainability generally, as well as that the goals are solid (Gibson, 2000). Similar clearance procedures with clear sustainability criteria are increasingly used in a number of different contexts, such as progressive construction standards, investment rankings of ethical firms, and non-government product certification programs.

Specified rules for making trade-offs and compromises

As we noted above in the discussion of sustainability and its implications, prospects for progress would be much enhanced by the availability of explicit rules and processes for decisions about trade-offs and compromises. Examples of such rules include (Gibson, 2001)

compensations and substitutions involving direct and indirect compensation for negative effects (where these cannot be fully mitigated): e.g., later rehabilitation of aggregate mining operations on somewhat degraded agricultural lands (substitution in time), and construction of a human made wetland to replace a relatively natural one (substitution in place)

net gain and loss calculations involving aggregation of net gain and no net loss calculations: e.g., weighing major damages to the interests of tribal people displaced by a new dam against more material security for larger numbers of poor farmers downstream (differences in place); and weighing efficiency gains from industrial process improvements balanced against associated job losses (substitution in kind, across principles).

Widely accepted indicators of needs for action and progress towards sustainability

Sustainability indicators have previously been identified and developed with much effort. This may be partially due to the fact that genuine interventions for change considered more dangerous to many institutions than work on indicators. However, the creation of indicators is still useful as a means of defining what is significant (thus also aiding in the establishment of objectives), and well selected and targeted indicators may be effective tools for agitation, empowerment, and education.⁸

When combined, these tools might provide a platform for sustainability-focused decision-making that is well-integrated, relatively transparent, adaptable, and locally changeable. The primary uses for these four tools might be in formal institutional decision-making. However, the fundamental goal is to create ingrained habits and expectations that would extend beyond decisions and actions outside the purview of official review and approval.

Information and incentives for practical implementation

A basis for sustainability-based decision making is not enough on its own. Sustainable governance also requires ways to motivate and direct appropriate action. Regulations pertaining to tax changes, procurement guidelines, liability laws, education initiatives, product labelling, tenure agreements, power-sharing procedures, and many other types of policy tools are available, and there are several ways to combine them.

Making pricing more accurate indicators of embodied costs—social, ecological, and economic—will be a huge problem since market-based or influenced decision making will inevitably continue to play a significant part in governance at all levels. However, basic methods are seldom accessible. Moral quandaries, conflicting approaches, and a lack of understanding often make it difficult to identify, assess, and monetise externalised costs. Even in straightforward situations employing the well recognised "polluter pays" concept, opposition to the adoption of cost-internalizing measures is widespread. Once again, it seems that the use of many tools will need to be carefully integrated, monitored, and modified.

Programmes for system innovation

The utilisation of already accessible technology may provide several environmental advantages

right now. Long-term sustainability, however, necessitates system innovation-related transformations. For the most part, performance requirements or the recommendation of specific solutions have been used in sustainability policymaking. A portion of the sustainability advantages were secured thanks to the implemented solutions. Policymaking frameworks that actively aim to discover, foster, and coordinate action toward more sustainable technology niches are necessary for governance for sustainability. Furthermore, governance efforts must make sure that they are followed by co-evolving social processes that are marked by ongoing changes in official and informal institutions, as technical breakthroughs only offer a portion of the necessary improvements. Because of this, governance for sustainability must be more proactive, long-term focused, using sustainable visions, and focused on learning, innovation, and adaptation.

"System innovation," or a radical shift in the systems of goods supply via the use of alternative resources, knowledge, and practices, is necessary to significantly enhance the existing development trajectories. Beyond the level of technical components, system innovation in the socio-technical domain represents change. It is linked to new connections, new information, new responsibilities and regulations, a new "logic of appropriateness," and often new organisations. The hydrogen economy and integrated mobility, often known as chain mobility, are two instances of system innovation that improves the environment. The hydrogen is produced in clean methods, such as by using renewable power sources.

According to the integrated mobility concept, users use various forms of transportation (individual and collective, such as cars and bicycles) based on information from mobility agencies that provide travel schedules and reservation services. Infrastructure (such as park and ride stations and dedicated bus lanes), technology (such as light rail in urban areas), and a variety of social and organisational changes are all part of chain mobility. These include collective car ownership and use (car-sharing and riding), the establishment of mobility agencies that offer and sell intermodal transport services, the integration of collective transport schemes, and the introduction of transport management systems for employees by businesses.

The regular functioning of markets is unlikely to give rise to such new systems. Institutional transformation and system innovation are inextricably intertwined. It necessitates transition management with some forethought since it cannot be caused by a single variable or event. Reflexive and adaptable planning must take the place of outdated outcome-based planning (Kemp and Loorbach, 2003).

Transition management

Currently, there are a number of environmental benefits to using technology that is already available. However, system innovation-related changes are required for long-term sustainability. Sustainability legislation has mostly relied on performance standards or the suggestion of particular remedies. The measures that were put into place helped to ensure some of the sustainability benefits. Governance for sustainability requires policymaking frameworks that actively seek to identify, promote, and coordinate action toward more sustainable technological niches. Furthermore, governance initiatives must make sure that they are followed by co-evolving social processes that are distinguished by continual changes in official and informal institutions, since technology advances only give a part of the essential improvements. As a result, governance for sustainability has to be more proactive, long-term orientated, using sustainable visions, and learning, innovation, and adaptation-focused.

To greatly improve the current development trajectories, "system innovation," or a drastic change in the systems of goods supply via the employment of alternative resources, knowledge, and practices, is required. Beyond the level of technical components, system innovation in the socio-technical sphere signifies change. It is associated with new relationships, new knowledge, new obligations and rules, a new "logic of appropriateness," and often new organisations. Two examples of environmentally beneficial system innovation are the hydrogen economy and

integrated mobility, sometimes referred to as chain mobility. Clean techniques, such the use of renewable energy sources, are used to manufacture the hydrogen.

Based on data from mobility providers that offer travel schedules and reservation services, consumers use a variety of modes of transportation (individual and group, such as vehicles and bicycles), according to the integrated mobility concept. Chain mobility includes a range of organisational and social changes, technology (like light rail in cities), and infrastructure (like park and ride stations and dedicated bus lanes). These include communal automobile ownership and usage (car-sharing and riding), the formation of mobility agencies that supply and sell multimodal transport services, the integration of collective transport schemes, and the adoption of travel management systems for workers by enterprises.

Such new systems are unlikely to emerge from the normal operation of markets. System innovation and institutional transformation are closely related. Since it cannot be triggered by a single variable or event, it requires careful transition management. Outdated outcome-based planning must give way to reflexive and flexible planning (Kemp and Loorbach, 2003).

In managing transitions, four basic rules require special attention (Kemp and Loorbach, 2003):

Be careful not to get locked into sub-optimal solutions. This calls for anticipation of outcomes and the use of markets for coordination and context control instead of planning. A second way of circumventing lock-in is by exploring different configurations through portfolio-management – a common strategy in finance is to hedge risks. One should not bet on one horse, but explore a wide variety of options, both incremental and radical.

Embed transition policy into existing decision-making frameworks and legitimise transition management. Transition management should be politically accepted and be a joint concern for different policy makers and society at large. Long-term goals chosen by society should guide policy, including responses to short-term concerns.

Take the long view of a dynamic mechanism of change. Make sure that the process does not come to a halt when positive results do not immediately materialise due to setbacks. One way of keeping the process on track is to view and institute learning as a policy objective.

Engage in multi-level coordination. Coordinate top-down policies with bottom-up initiatives (engage in vertical coordination besides horizontal coordination). Local experiments should inform national policies and there should be strategic experimentation for system innovation; two things that did not happen in the past. There should be more and better coordination between top-level policies and local policies and also among various horizontal policies. National policies should be coordinated with international policies, because go-it-alone policies can be economically harmful unless there are clear first-mover advantages.

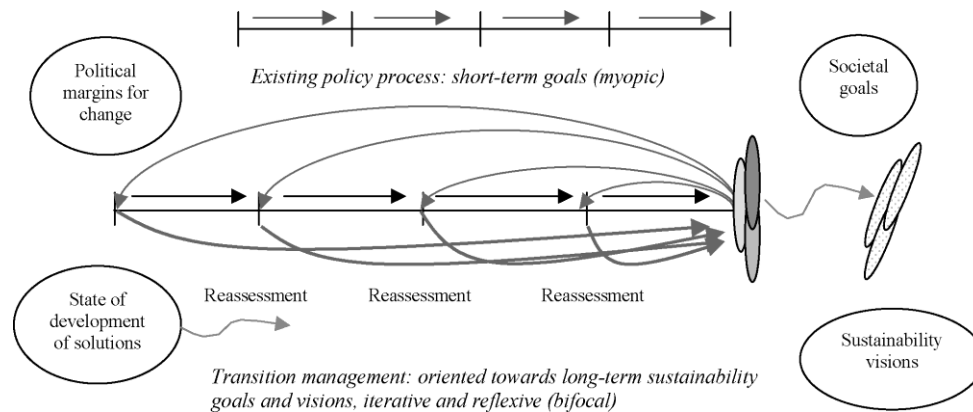
A last transitional consideration is fairness (Gibson, 2001). As noted above, even many of the most desirable sustainability-oriented initiatives will involve trade-offs, bringing the danger of inequitable distribution of gains and losses. Such inequities are particularly worrisome where the losses may be borne by those who are already disadvantaged (a sadly common feature of past development assistance projects). Preparing for just transitions (Burrows, 2001) that avoid adding to disadvantages, and provide satisfactory compensation when all else fails, is crucial.

In the Netherlands the national government committed itself to sustainability transitions in energy, transport, water management, natural resource use, and agriculture. For this they are using the model of transition management developed by Rotmans et al. (2000) (elaborated in Kemp and Rotmans, 2005; Kemp and Loorbach, 2003) A schematic view of transition management is given in Figure 1.

The Dutch model of transition management is a form of process management. Transition management has short-term goals and long-term goals, with the latter being based on societal goals and visions of sustainability. The short-term goals are informed by the long-term goals and comprise learning goals. Sustainability visions are explored using small steps. Transition management breaks with the old plan-and-implement model aimed at achieving particular

outcomes. It is based on a different, more process-oriented philosophy. This helps to deal with complexity and uncertainty in a constructive way. Transition management is a form of process management performed against a set of goals set by society whose problem-solving capabilities are mobilised and translated into a transition programme, which is legitimised through the political process.

Figure 1 Transition management



Source: Kemp and Loorbach (2003)

Transition management does not aim to realise a particular path at all costs. It engages in the exploration of promising paths, in an adaptive manner with exit strategies. It does not consist of a strategy of forced development, going against the grain, but uses bottom-up initiatives and business ideas of alternative systems, offering sustainability benefits besides user benefits. Key elements of transition management are

development of sustainability visions and setting of transition goals

use of transition agendas

establishment, organisation and development of a transition-arena (for innovative actors) besides the normal policy arena

use of transition-experiments and programmes for system innovation

monitoring and evaluation of the transition process

creating and maintaining public support

portfolio management

use of learning goals for policy and reliance on circles of learning and adaptation.

In this paper we cannot explain it in full. It fits with all the considerations of sustainability described in Section 2 and incorporates the key components of governance for sustainability of Section 3, namely policy integration, common objectives and criteria, internalisation of external costs, and programmes for system innovation.⁹ It puts government policies in a different, longer-term perspective and tries to better align specific policies. It is not based on blueprint thinking. No choice is made about ideal future functional systems. Different visions and routes are investigated through adaptive policies: decisions are made in an iterative way and support is temporary. To ensure flexibility, the goals and policies towards these are continuously reassessed and adapted. By being adaptive and anticipatory, transition management helps to deal with the tension

between creative change and conservation, between innovative experiments and maintaining the integrity and stability of functions (Rammel et al., 2004). Transition management is best understood as an attempt at goal-oriented modulation or directed incrementalism (Grunwald, 2000), offering a model for policy integration.

Conclusions

In order to support transition management as the framework of analysis to create routes to a more sustainable future, we have sought in this study to dissect and combine the extremely broad and chaotic concepts of sustainability and governance. We emphasised the importance of system innovation as a policy strategy in this argument. We also emphasised the need for a multifaceted view of the institutions that conduct governance.

A significant but inevitable difficulty is governance for sustainability. It is not feasible to continue being unsustainable. Establishing governance structures and practices that can support, direct, and coordinate constructive work by a variety of actors on a wide range of complex issues across multiple levels and scales, through webs of interconnection, with sensitivity to their contexts and respect for uncertainties, is necessary for the advancement of sustainability. There are several benefits to this idea. It includes the many and varied strengths, motivations, and capacities of all public, private, and civil society actors, both collective and individual, as well as their many interrelationships, in addition to traditional government institutions and commercial interests. In order to accomplish the intended shift, it is difficult to integrate knowledge, direction, and action enough.

The market's or any other blind mechanism's inherent wisdom cannot be assumed. We are also unable to summon the dedication and omniscience necessary for a central authority that is fully competent. We must integrate and move beyond the authority of commerce and command in order to develop effective governance for sustainability, which is best achieved via comprehension, direction, and procedure.

There is no fast or simple way to complete a large transition, and human performance in intentionally planned and guided transitions is poor. The shift to sustainability requires as much humility as dedication, as much variety as guidance, and as much innovative experimentation as unwavering protection if it is to be effective. The decision-making process and the decision makers' credibility will inevitably play a major role. A wide range of diverse stakeholders must be engaged in governance for sustainability. Since they are unlikely to cooperate well, there should be a commitment to transitions and the importance of government as a democratic authoritative force (even when government is part of the issue).

For sustainability, there isn't just one ideal kind of governance. The specifics must change, taking into account the unique circumstances of each situation. However, the current discussions on governance for sustainability do suggest a fundamental framework and approach, and there is cause for optimism that much more may be clarified and specified without sacrificing consideration for specific situations. The pursuit of sustainability may be compared to the search for the illusive "Holy Grail" of integrated knowledge and action, which is unattainable and will never be discovered in a single pure form. However, a lot can be accomplished. It is feasible to make progress.

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