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COMBATTING CLIMATE CHANGE: UNDERSTANDING THE ROLE OF SUSTAINABLE DECISION MAKING

Climate change has been capturing the headlines as the changes continue to be manifest and show worsening conditions affecting our planet. For tourism this has also become a major concern as the contributions made to climate change by the tourism industries has been highlighted. We have been part of a project in the Faculty of Business and Economics to consider how the challenges of climate change can be addressed. This present article has therefore been published in the frame of the project TÁMOP-4.2.2.A-11/1/KONV-2012-0064. The project is realized with the support of the European Union, with the co-funding of the European Social Fund. The Department of Tourism at the University of Pannonia has long been committed to the principles of sustainability and in this article we attempt to adopt the lessons which have been developed in the area of sustainability to the challenges of combatting climate change. We have observed that there has been a tendency for the climate change literature and the sustainability literature to create and operate within two distinct spheres. This article is an attempt, with our international partners from the United Kingdom and Slovenia, to identify good practices that have been developed within the sustainability sphere and bring them into play in the governance of communities concerned with combatting climate change.

Following a critical review of the literature, we consider three mechanisms that we believe have value in building better approaches to planning, community building, empowerment and sharing responsibility. These include a decision making tool, the use of the sustainability wheel and the integrated sustainability community planning approach. They demonstrate the need for communities to be empowered through greater involvement in decision making, based on greater knowledge and a sense of responsibility for future developments. Governance can no longer be based on conventional planning approaches alone, the expertise of the planner must be extended by and through the involvement of the communities. Therefore these three processes share a commitment to inclusivity and a holistic approach for exploring, examining and easing emergent issues surrounding climate change.

Sustainable decision making

Concepts related to sustainable development have influenced planning and management for over a century. As early as 1909, the Canadian Commission for Conservation was established to examine resource conservation and urban environmental issues (McCarthy et al. 2006). Key conceptual developments in the 1970s and 1980s include environmental management and assessment (UNEP 1972), limiting growth (Meadows et al. 1972), the emergence of the notion of "appropriate technology" (i.e. technology that is small-scale, decentralised, energy efficient, ecologically sensitive, and locally controlled; Schumacher 1973), and conservation of resources (IUCN 1980). However, it was not until publication of Our Common Future that sustainable development became a primary concern for policy-makers (WCED, 1987, p.8). Despite recent debates over the meaning of the term "sustainability", a consensus has emerged that suggests that sustainability "must aim to foster and preserve socio-ecological systems . . . that are dynamic and adaptable, satisfying, resilient, and therefore durable" (Gibson, 2006a, p. 173).

Much of the sustainability planning undertaken in an international context is influenced by protocols developed by Agenda 21 of the Rio Declaration on Sustainable Development. Of particular interest is Chapter 8, which deals with integrating environment and development within decision-making through the establishment of policies that reflect a long-term perspective and facilitate cross-sectoral approaches (UNEP, 1992, p. 65). The Declaration also argues that responsibility for these developments should fall to the lowest level of public authority, which is known as the principle of subsidiarity (UNEP, 1992, p. 66). The Declaration supports adaptive and integrated strategies that consider multiple goals while maintaining flexibility for adjusting to emerging issues that threaten sustainability.

The emergence of collaborative processes designed to harness multiple perspectives across sectors (Innes 1996, Healey 1998, Healey 2004) and the promotion of local action has benefitted from the "communicative turn" in municipal planning (Tewdwr-Jones – Allmendinger 1998). Indeed, many countries have adopted more inclusive approaches to sustainability that are conducive to achieving local objectives (Bagheri – Hjorth 2007, Partidário et al. 2009). We believe collaborative planning theory, with its focus on integration, multiple perspectives, and inclusivity, can support sustainability. By incorporating many of the concepts proposed within Agenda 21 and by promoting a collaborative planning approach, it is possible to look toward a deeper understanding of sustainable development.

A holistic sustainability assessment should include economic, environmental and social aspects on different impact levels ranging from the material or site-specific level to the system

level via the local semi-regional or the so-called narrow life-cycle level. An important question in such an analysis is how different aspects and different levels should be assessed and valued (Hansson 2010, Edvardsson Björnberg – Hansson 2011). Often at the local level great efforts are made on local-scale risk assessment while social and larger-scale environmental impacts are regarded as abstract, hard to estimate in relation to the impacts and therefore often omitted (Johansson 2008, Glaas et al. 2010).

On the international and national political agenda, sustainability is usually assessed using tools developed including carbon foot print analyses (PAS 2050 2008), life-cycle assessment (LCA) (ISO 14040 2006) and integrated assessments such as the Regional Air Pollution Information and Simulations (RAINS) and the Greenhouse gas and Air pollution Interaction and Synergies models (GAINS) (IIASA 2012). There is a tendency to consider site-specific and local aspects in those methods. Applying these methods can be a time-consuming exercise and even for large investments the integration of environmental aspects in the decision making can be problematic (Johansson 2008, Suer et al. 2009). Land-use changes, such as physical climate-change adaption measures may encompass large-scale, costly, long-lasting investments that may increase the risk of maladaptation and they require assessment of long term impacts and potential risks through their life time (Birkmann 2006, Schuster - Highland 2006, Barnett – O'Neill 2010). For example erosion-prevention measures may cause erosion elsewhere, and a measure to reduce climate-change-induced risks may contribute to increased emissions of greenhouse gases, thereby counteracting the cause, and disproportionately increase burdens for already vulnerable people or high economic, social and environmental costs (Barnett – O'Neill 2010).

The Decision Process Support Tool

The aim of the decision process support tool development (Andersson-Sköld et al 2014) was to provide a checklist and a methodology to promote discussions in order to facilitate the identification and compilation of potential climate-change measures, such as exploitation and remediation activities and their consequences. The tool was further developed to be used as a discussion basis, to show weak points, knowledge gaps and uncertainties, and to visualise trends. In addition, it should contribute to a more transparent decision process and increase the traceability of the reasoning behind the decisions taken. The aim is further to include environmental perspectives from local and regional perspectives up to global scale and to identify and illuminate social and economic impacts of potential planning strategies or climate-change adaptation measures, thereby contributing to the evaluation of which is the

most sustainable strategy including economic, environmental and social aspects from short- and long-term perspectives.

In order to make the tool applicable, it must fit with existing decision processes such as those used in spatial planning and other processes similar to the climate-change adaptation process such as risk and vulnerability analyses. The goal therefore was to adapt to a structure that follows a classic vulnerability analysis, i.e. to include the following steps (Brooks 2003, Füssel - Klein 2006): risk identification; risk assessment; risk valuation and suggestion of measures. The result of such an analysis should then be the basis for decisions, the implementation of measures and consequently include further steps than in the most common risk and vulnerability analyses (Brooks 2003, Füssel - Klein 2006, European Commission 2009).

The tool should be used to encourage both experts and civil servants to make estimates in order to:

(a) develop insight into the consequences and sustainability of the alternative measures,

(b) make the background to the estimate structured and encourage transparency,

(c) find important but weak points that need to be further assessed to find a robust decision basis and

(d) provide a decision basis covering the sustainability aspects as defined by UN (WCED,1987), also taking into account the long-term perspective.

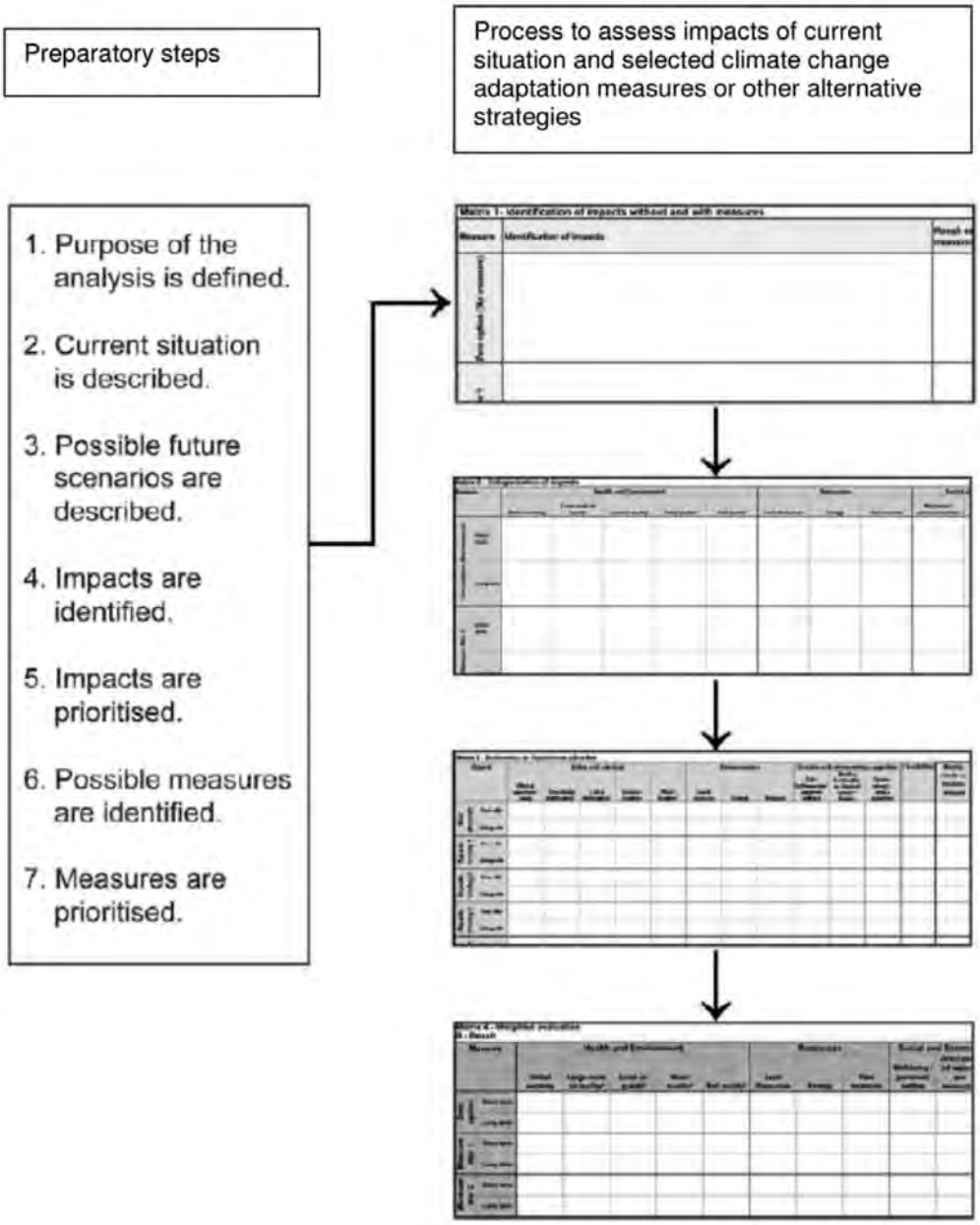

Figure 1. A decision process support tool (from Andersson-Sköld, 2011).

Results of tool application on climate-change adaptation

Andersson-Sköld et al (2014) demonstrated that using the tool encouraged brainstorming activities. The aim was to summarise the consequences of the current situation in the event of flooding, identify potential measures that could be taken to reduce the negative consequences (and/or the probability of the event) and to identify consequences (pros and cons) of the suggested measures.

In their example from Linköping the information regarding the situation (today and in a future climate) was provided by the municipality. Examples of consequences of the current situation in the event of flooding included flooded buildings, reduced or stopped activities of important objects such as the water and sewage system, telecom, heating plant, waste disposal plant, rail, roads and streets, cultural and natural values, due to direct consequences or due to power cuts and secondary natural accidents such as landslides. During the meeting both physical and non-physical measures were suggested. Among the physical measures suggested were to investigate reserve power in the municipal waste water treatment plant, embankment of the sewage plant and to make a dike with garbage and plastic at the combined heating and waste disposal plant. Initially all measures mentioned were physical, while by the end of the meeting also risk investigations and risk mapping were presented as well as activities to increase the awareness including information, education and communication with land owners. Some of the suggested measures were at once regarded as too expensive and complicated for further considerations. These included moving the sewage treatment plant and the heating/waste disposal plant to higher locations.

For all suggested measures the pros and cons were identified and the brainstorm results were summarised. During this first meeting also the first attempts to start describing and assessing the impacts of the alternatives were initiated. This step was thereafter done by the research team and at the second meeting the qualitative descriptions and the assessments were updated and finally agreed upon. The use of the tool encourages discussion, and that the systematic view of sustainability increased awareness of the holistic perspective. The main identified negative impacts of the institutional measures were that they were time consuming (municipal officials have very limited available time), may lie outside the mandate of local administrators (e.g. may require national political decisions) and may require organisational changes.

In another case, the test of the tool was done late in an ongoing risk analysis and planning process and therefore most of the impacts were based on previous and ongoing investigations. However the results from the investigations could be included in the matrix. The use of the

tool therefore was that the completed matrixes summarised those results and could visualise the impacts of the different alternatives by the colours symbolising the grading.

This research draws on Gibson's synthesis of arguments drawn from the sustainability literature, practical experience and integrates considerations from ecological systems theory, corporate greening initiatives, growth management planning, civil society advocacy, ecological economics, community development and a host of other fields. (Gibson 2005, p. 95) Indeed, the book Sustainability Assessment (Gibson 2005) and related journal articles (Gibson 2006a, 2006b) are among the most cited sustainability works.

Three of Gibson's principles (livelihood sufficiency and opportunity, equity, and socio-ecological civility) capture socially oriented characteristics such as social inclusion and collaborative decision-making, while the remaining four principles (precaution and adaptation, resource maintenance and efficiency, socio-ecological integrity, and immediate and long-term integration) represent more traditional ideas relating to sustainability. Of these principles, socio-ecological civility and long-term integration have seen international exposure within frameworks focused on planning for sustainability (Morrison-Saunders and Therivel 2006, Pope 2006, Bagheri - Hjorth 2007, Partidário et al. 2009). In Europe, it has been argued that sustainable development requires a transformative governance structure to address the emergent elements (Bagheri - Hjorth 2007). This has led to strategies focusing on restructuring governance systems to a new style of management that adapts based on anticipation and reflection, while promoting an integrated process and spatial awareness of issues (van der Brugge et al. 2005, Bagheri - Hjorth 2007). Within these strategies, integration of sustainability across all levels of government is seen as a priority especially within both decision making processes and management frameworks (Pope 2006, Partidário et al. 2009), particularly through trans-disciplinary approaches that avoid compartmentalising sustainability planning and practices into discrete "pillars" (Robinson 2004).

Governance models and Integrated Sustainability Community Planning (ICSPs)

Although no specific template is required to qualify a document as an ICSP, several guides have been created to share base information about developing these plans (AUMA 2006, AMO 2007, Ling et al. 2007, Service Nova Scotia and Municipal Relations 2007, Park et al. 2009). While each guide offers a unique perspective, the following stages for ICSP development and implementation commonly emerge:

(1) define the goals and establish the structure of the process;

(2) gather input to create a long-term sustainability vision for the community;

(3) describe the current realities and analyse them within the lens of the established sustainability vision;

(4) develop a strategy, and identify and assign responsibilities;

(5) have city council formally to approve the ICS plan; and

(6) implement, monitor, and review progress.

Within the international community (UNEP 2012), concerns have been raised regarding insufficient progress on the integration of sustainability into municipal planning practice.

Using cases from municipalities in Canada, Stuart et al (2014) promote an inclusionary process by encouraging the involvement of various actors, specifically emphasising involvement of municipal government departments, city council, local businesses, as well as community and citizen groups, while their approaches vary significantly. One municipality attempted to modify a traditional decision-making method to embrace an inclusionary approach to sustainability planning. However, another's community-owned approach represents a departure from centralised decision-making processes that have become the mainstay of municipal planning and policy creation. At first glance, a community-owned framework may seem ill-suited to deal with the inherent complexities of sustainability as success will be largely predicated upon adequate levels of participation and expertise.

Higher rates of participation can be achieved through several methods, the most important of which deals with ensuring certain goals of the plan become the responsibility of community groups, nurturing stewardship and empowerment among community-based groups. While this process attempts to solve the issue of adequate participation, concerns over expertise remain. This facet is confronted by forging partnerships between multiple entities to ensure the goals and objectives related to sustainability benefit from a truly collaborative and integrated process of development and implementation.

Regardless of structure, ICSPs promote strategies of collaboration and partnership building between all stakeholders. The dominance of socially oriented principles suggests that the ICSP approach represents a platform from which municipalities can address emerging concepts related to social equality and inclusion in decision-making processes. By putting the focus on social initiatives, ICSPs treat social aspects of sustainability with the same importance as economic and environmental issues.

Another issue for ICSPs is the incorporation of innovative concepts and long-term planning practices as key factors. ICSP frameworks are designed to be accepting of diverse groups and institutions that may not have played large roles in sustainability planning previously, whilst maintaining a long-term planning approach as a fundamental requirement to achieving sustainability, which recognises that the process must be ongoing and adaptive to change.

Enhancing policy relevance through community-based monitoring

ICSPs should promote community-based monitoring to support implementation. This approach is policy relevant in terms of extending adaptive management expressed through both conventional planning processes and collaborative planning as municipalities move from top-down to shared decision-making processes. The benefit of monitoring, and in particular multi-party community-based monitoring, is that it engages ordinary citizens to work together on shared objectives, fostering the ability of citizens and organisations to become more involved in sustainability initiatives (Bliss et al. 2001). Thus, the ICSP process should develop monitoring guidance to ensure that adequate and relevant monitoring information is obtained and reviewed, while also providing a centralised database accessible by all involved (Cuthill 2000, von Malmborg 2003, Whitelaw et al. 2003).

Transferability of ICSPs

Utilising Gibson's sustainability principles to evaluate ICSPs provides considerable insight into the direction that municipal planning could take with regards to sustainability. Overall, many aspects of these plans are designed to integrate the three pillars of sustainability into a dynamic framework while acting as a platform in which concepts of collaborative planning and inclusion are operationalised. While these issues were identified over two decades ago within Agenda 21, a 20-year review of the plan entitled "The Future we Want" reveals there has been insufficient progress made regarding the integration of the three pillars within the international community (UNEP 2012, p. 4). Advocating ICSP reiterates the importance of broad public participation and access to proceedings that promote sustainable development within regional, national, and subnational judiciaries (UNEP 2012, p. 8).

The information gathered by Stuart et al (2014) suggests ICSP is making meaningful progress towards addressing these issues of integration and inclusion within the decision-making processes and management frameworks. Moreover community-owned approaches to ICSP may represent an effective model that is uniquely suited to promote collaborative planning by empowering community groups and individuals with substantial responsibility and authority. As many communities face challenges relating to social inequalities within decision-making processes, a dynamic and socially-driven approach to sustainability planning could be beneficial in the future. Due to the adaptive nature of the ICSP process, should the model prove successful in achieving meaningful progress towards sustainability, there exists

the possibility for adaptation to address the issues imparted by Agenda 21 and subsequent reviews (Ling et al 2009).

The Sustainable Wheel

While many studies and reports on water governance refer to the concept of sustainability, few of them systematically reflect on the value base of sustainability and about what it means to contextualize the general principles of sustainability in specific contexts (Schneider and Rist 2013). Consequently, only a few authors have elaborated transparent and value laden sustainability principles (Wiek - Larson 2012). In-depth reflection on the underlying values of a more sustainable future and its contextualization for specific water governance systems however, is fundamental for defining actions for more sustainable water governance and re-casting policy discourse (White 2013).

According to the definition formulated in the Brundtland Report, "sustainability implies a concern for social equity between generations, a concern that must logically be extended to equity within each generation" (WCED 1987: ch. 2 para 3). This means that sustainable water governance systems should allow the current generation to meet their societal goals in an equitable way without compromising the water options of future generations (ASCE and UNESCO 1998). Based on these general ideas, and taking into account other literature on water sustainability or governance (e.g. Gleick 1998; Wiek - Larson 2012; Pahl-Wostl 2009; Hill 2013; Gibson 2006a), four main principles for sustainable water governance systems can be identified (Schneider et al 2014):

(1) Contribution to societal goals of regional development: This first principle states that people living today, and in the future, should be able to meet their development goals. Water availability should allow them to satisfy diverse needs ranging from household consumption and recreation to economic activities such as production of food, energy, or other goods and services.

(2) Maintenance of ecological and hydrological integrity: Maintaining the ecological and hydrological integrity of water resource systems is crucial for meeting development goals of not only the current population, but especially of future generations. This second principle is about the quality and quantity of surface and groundwater as well as about the benefits and harms to the ecosystem resulting from diverse water uses (Kondratyev et al. 2002).

(3) Contribution to social justice: As stated in the Brundtland definition of sustainability (WCED 1987), justice concerns should not only be considered between generations, but also within the current generation. Consequently, social justice has to be regarded as a basic element of water sustainability.

(4) Adaptive capacity: In times of increasing uncertainty due to socioeconomic and climate changes, the ability to flexibly respond and adapt to changing supply and demand is an essential requirement for the sustainability of water governance systems (Pahl-Wostl 2009). Adaptive capacity is therefore considered a fourth main principle of a sustainable water governance system (ASCE and UNESCO 1998). It refers to the capacity of actors to create and respond to variability and change, as well as the impacts on the state of the system in both proactive and reactive ways (Hill 2013; Adger et al 2005).

Figure 2. The Sustainability Wheel for the water governance system.

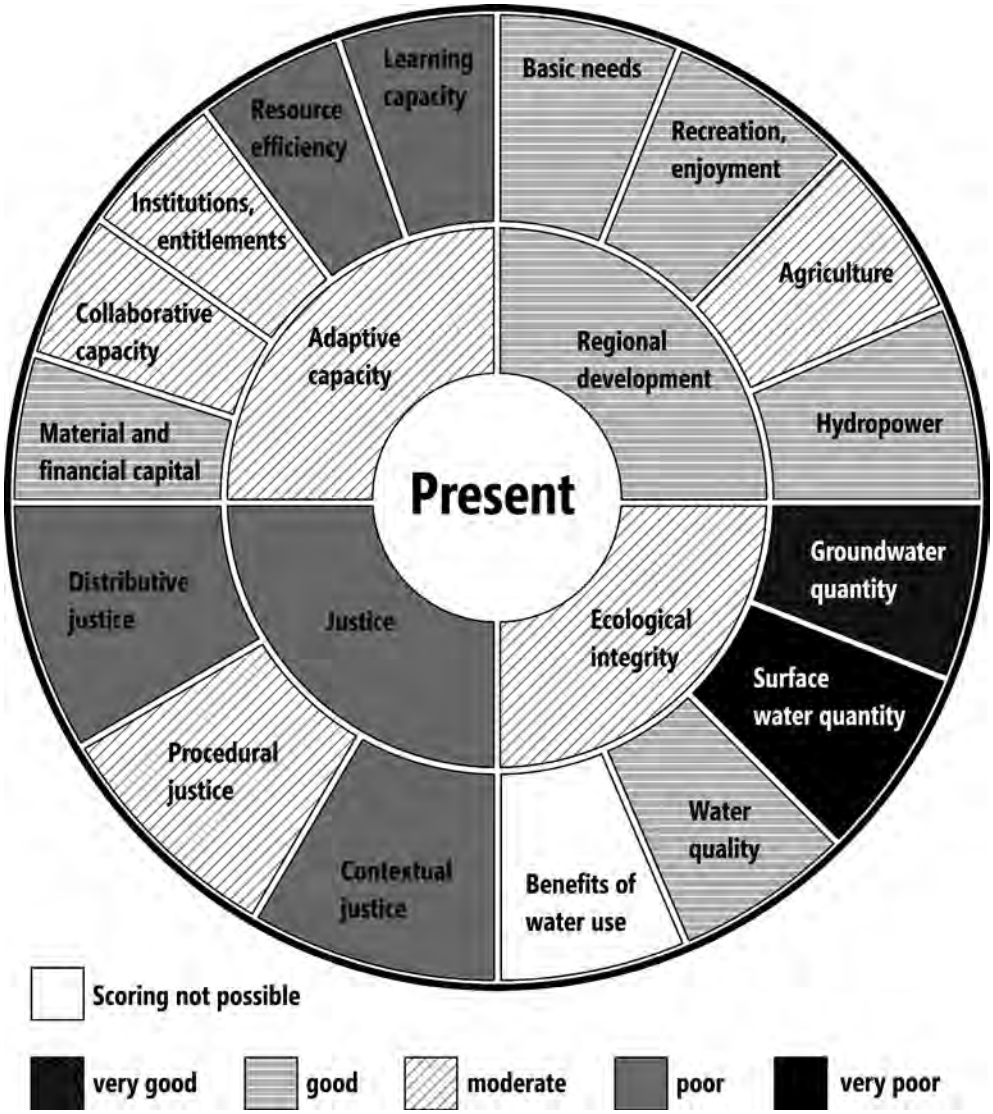

Figure 3: The Sustainability Wheel for the present for Crans-Montana-Sierre

Justice: The justice principle indicator ratings show that water justice as a whole is currently rather poor in the region, whether in terms of resource allocation and costs or at a legislative level.

Distributive justice: Costs, risks, and benefits of water are very unequally distributed in the region. For instance, the water richest commune (Icogne), with just a few hundred inhabitants, can use more than 50% of the water resources available (Reynard et al. 2014). Not only does this provide relief from any water scarcity problems, but it has also enabled Icogne to grant hydropower concessions and consequently to collect considerable amounts of water interest rates (Schneider et al, in print). On the other hand, the water poorest commune (Veyras) has to buy most of its drinking water from other communes and is, therefore, highly dependent on their surplus water. Moreover, water prices can vary more than 100% from one commune to another, and infrastructure costs are also highly variable.

Procedural justice: Access to water and the organization of public management bodies is regulated on different levels (national, cantonal, communal, and private laws), and decision making is mostly transparent. There is nevertheless a multitude of bilateral agreements among the different water users that are not easily accessible. At times, there is a lack of transparency because the situation is too complex, e.g. nobody has an overview about the water rights situation, or decisions are based on oral customary law and informal agreements. Most problematic is the aspect of inclusiveness. No institution exists that embraces all relevant water users on a regional level and can mediate the diverse interests of the water users (Schneider – Homewood 2013).

Contextual justice: The capabilities of the communes and other water users to access water are very unequal for various reasons. First of all, communes that contain large high mountain catchments including rivers and springs can use much higher amounts of water than communes on the lower slopes that do not possess their own wells. Second, communes that have historically held water rights for sources outside their communes have more opportunity to obtain sufficient water (Reynard 2000a, 2000b). Third, ancient water rights mainly favour agricultural water users and hinder new water users from accessing water (e.g. for tourism and urbanization). Finally, communes with higher negotiating power can secure more favourable agreements with other communes or other user groups. This is the case for the six communes of the Haut-Plateau, which are better coordinated than the communes on the lower slopes.

The sustainability wheel demonstrates the following advantages:

(1) It allowed very different sources of knowledge (research from natural and social sciences, qualitative and quantitative knowledge, empirical, and interpretative approaches) to be combined and brought to fruition. Consequently, the Wheel facilitates in depth interactions, knowledge exchange, and learning among the interdisciplinary team of researchers.

(2) It allowed the consideration of complex relationships between issues of resource availability, water use, and management. In doing so, it was evident that certain measures, such as a strong increase in residual flow, might improve the indicator of surface water quantity; however, the needs of agriculture would be compromised as a result, thus affecting the indicator of agriculture. Furthermore, it could clearly be shown that sustainable water futures can be reached (and also impeded) through different means. However, it also became clear that technical solutions alone will not solve the existing access and distribution. These solutions need to be embedded in fundamental institutional reforms.

(3) It permitted the information from disciplinary works to be structured in a meaningful way and allowed their implications to be elucidated from a comprehensive understanding of sustainability. It allowed us to easily discern which sustainability dimensions are most critical, both for today and for the different future visions, facilitating communication with stakeholders considerably. They could easily see that the water governance system can respond quite well to society's goals of regional development and also that the situation regarding water justice is critical. Moreover, they were able to see that sustainable water futures are possible as well, although this highly depends on the social, economic, technical, and institutional reforms they are willing to take. Discussions about the reasons for certain scoring made stakeholders aware of possible trade-offs between the indicators. The Sustainability Wheel can thus be considered an excellent communication instrument.

Conclusions

This article has attempted to demonstrate that holistic and inclusive approaches have benefits to offer to the planning and governance of the challenges emerging from the continuing climate change debates. Governance needs to be able to deal appropriately with the emergent issues and offer the prospect of adapting to these challenges. We have reviewed three processes that can inform good practice and help governments to combat the challenges of climate change. We make no apology for retrieving these process models from the sustainability literature as we are confident that the principles of sustainability must underpin and be enshrined in the constant efforts to minimise and ameliorate the effects of climate change. Strong communities, empowered through knowledge and participation, will be better placed to work together to meet the emergent challenges that climate change can have over our lives, our work and our futures.

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