Tourism and Sustainable Development Indicators: The Gap between Theoretical Demands and Practical Achievements

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This paper outlines the historical context in which indicators appeared, and links this to the need for improving information systems. The conclusions are made with particular regard for emerging issues, the most recent of which is that of sustainable development. Owing to the rather low reliability of data and to the difficulty in defining the limits of tourism as an economic activity, articulating sets of sustainable development indicators (SDIs) appears to be even more difficult for tourism than for other industry sectors. Recent and current attempts show a great variety of methods and results. They relate in particular to

- **the various demands placed on the data,**
- **the geographical scale to which the indicators refer and**
- **the type of policy called upon to foster sustainable development: public policy, self-regulation, etc.**

The results indicate that a certain set of issues raised by sustainable development are privileged while others are left aside. This underscores the need to review the more theoretical aspects of sustainable development debates within practical attempts to build indicators.

In recent years, an ever-rising demand for indicators has hallmarked the field of environment and sustainable development. In the field of tourism, statistical institutions, international organisations (the World Tourism Organisation or the World Travel and Tourism Council with the Green Globe programme), state and local authorities have attempted to build sets of indicators enabling them to measure progress towards sustainability.

What drives the work on sustainable development indicators (SDIs) in the field of tourism? The most obvious answer is an aim to improve assessment processes. Tourism is an industry noted for particularly weak statistical data and the questions posed by sustainable development analysis add an additional degree of uncertainty. It has been proposed that indicators can ameliorate the situation with regard to several aspects of the problem. First, such indicators are constructed to focus efforts on improving underlying information systems. Second, it is intended that such indicators should give more concrete content to the concepts of sustainable development, i.e. the tangibility and meaning that stakeholders often find lacking in purely theoretical or ideological debates. Third, they provide content upon which to centre meetings of actors and ongoing

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dialogue. Finally, as evidenced by the recent upsurge in such instruments as charters, labels, etc. (Dubois & Ceron, 2000) the construction of indicators is, at least in theory, linked with decision-making processes and issue resolution.

The current study attempts to show the wide variety of results in need of explanation. To start with, a survey is necessary to recall the historical background and theoretical attributes of the indicators. We shall then show how sustainable development underscores the demand for indicators, in particular with reference to the field of tourism. Our analysis of a series of attempts to build sets of SDIs for tourism highlights the gap between theoretical requirements and practical achievements. The final selection of SDIs usually depends on the temporal and spatial scales of the surveys (local, national, regional, intergration of global concerns in local sustainability assesment), on the targeted stakeholders and, furthermore, on the type of policy to be called upon by the authors to foster sustainable development (for example, public policy, multi-stakeholders processes, self-regulation, etc.).

A Renewed Interest in Indicators

The historical background: Indicators prior to sustainable development debates

Indicators are expected to capture and translate a complex reality: one typical example is that of national monetary wealth and its growth as the basis of national welfare: the GNP was designed to express this. This indicator, was supposed to enable the measurement of trends, to allow a comparison of the situation between countries. It was not especially subject to criticism as long as economic growth remained high; at a global level agreement on its content held (Fourquet, 1980). When that ceased (May 1968, the oil crisis, the rise of environmental concerns), the context in which the indicators were constructed changed: the 1970s were thus marked by work on social indicators which were intended to correct the economist's flawed GNP (Campo Urbano, 1978; OECD, 1976). Later, the rise in environmental consciousness and the creation of related institutions encouraged the construction of environmental indicators (Briassoulis, 2001), answering a technical and administrative demand (for example, the need to monitor water pollution).

Following a temporary decline in public interest the 'environment' returned to the public scene with attention now focused, in particular, on trans-border problems (damage to forests by acid rainfall, Tchernobyl) and on such grobal issues as climate change. Environmental issues, given the recent recognition of their importance, now stand in public debates at the same level as social and economic issues even if, when it comes to decision-making, the economic dimension often continues to prevail. This trend led to the emergence of the concept of sustainable development. The definition of sustainable development given by the commonly cited Brundtland report – 'a development that meets the needs of present generations without compromising the ability of future generations to meet their own needs' (World Commission on Environment and Development, 1987) – was carefully worded to avoid conflict. Its very soft and general formulation has the advantage of facilitating the meeting of people and institutions

which hitherto ignored each other. Under these conditions however, the debates can quickly appear to be void of sense.[1]

Doubtless, the construction of SDIs is supposed to cope with this challenge. Chapter 40 of Agenda 21 ('information for decision-making ') insists that the need for information on sustainable development is felt

> at all levels, from the national and international level for main decision makers, to the local level and to that of individuals It is thus necessary to work out sustainable development indicators so that they constitute a useful base for decision-making at all levels.

Numerous sets of indicators have been built. Considering sustainable development in general, one can distinguish two categories:

- The work of ' think tanks ' animated by academics or NGOs: for example the work of the Wuppertal Institute (Spagenberg & Bonniot, 1998) or that of SCOPE (Scientific Committee on Problems of the Environment, 1995), which gathered scientists together who had been working for a long time in the environmental field. They tend to have a global view on the issues, to establish a hierarchy among them, which might reflect the specific scientific orientations or ideological options of the networks within which the authors usually work.
- The works of government or international agencies: these often reflect a search for new approaches to development which is mitigated by the obligation to produce results and recommendations and to quantify.

In these two categories, very few indicators deal with tourism. Tourism is not mentioned in the UN indicators of sustainable development (United Nations, 1996).[2] In the British selection (Department of the Environment, 1996), tourism and leisure are taken into account through two indicators (length of stays and air travel). The French selection includes, within 307 selected indicators, one concerning the pressure of tourism on the coast and mountains and others in the fields of transport and mobility (Institut Français de l'Environnement, 2001).

How can an indicator be defined?

Definition and scientific requirements

An *indicator* is, foremost, *a variable* which can take a certain number of *values* (statistical) . . . or *states* (qualitative) according to circumstances (temporal, or spatial for example in the field with which we deal). The value or state of the indicators can sometimes be directly measured or observed; in the majority of cases they result from an analysing and processing basic data. This processing can be very sophisticated and when it leads to a high degree of combination and aggregation, one tends to speak about *indexes*, there is thus no difference in nature between indexes and indicators, just a difference in complexity (Gallopin, 1997).

The key point which distinguishes an indicator from basic data is its capacity to carry a meaning which exceeds its pure quantitative value (for example a temperature of 39°C not only indicates the temperature of the body of a person but also the fact that he is ill (Rechatin, 1997)). This capacity of indicators explains our interest in them (although the simplification of phenomena that indicators imply is frequently questioned[3]). Hence they help to summarise and simplify

information, to clarify certain phenomena and to quantify already known problems. This significance comes from their interpretation, and from their use within a diagnosis or analysis.

It is also necessary to stress that indicators must be built on a on serious scientific basis (i.e. an agreement experts of the ability of a variable to reflect a given phenomenon) and reliable data. This scientific requirement, in principle, implies that any expert assessing the same issue under the same conditions will reach the same conclusion. This does not exclude margins of error but requires that these are stated and assessed. The qualitative character of certain indicators should not imply that it is possible to escape these requirements. Indicators are not 'guestimates' . . . Overly liberal, or haphazard use of the term is likely to jeopardise one of the major interests of the work on the indicators – to improve upon *available data* so stakeholders can readily understand them.

The scientific requirement raises another issue. Indicators frequently used in a normative context (political decision) imply value judgements on the facts that they are supposed to describe. Should the value judgements be included within the indicator or remain external to them? Users often push for the inclusion of value judgements, both because it simplifies their task and because it avoids explaining some choices (the decisions then seem to be purely based on quantitative data which are less likely to be questioned).

Various authors have listed the requirements with which environmental indicators should comply (Bakkes *et al.*, 1994; Ruitenbeek, 1991). In Table 1 we give the list developed by Rump (1996) since it seems to be one of the most complete examples.

We have detailed in another text (Ceron *et al.*, 2000) the almost insurmount-

Table 1 Criteria to which environmental indicators should comply (adapted from (Rump, 1996) and (Rechatin, 1997)

1. Quality of the data and accuracy of analysis
• Scientific value (experts' agreement, non-ambiguous)
• Availability and accessibility of the data.
• Quality of the data (precise, robust and reproducible, indication of margins of error)
• A reasonable cost-advantage for obtaining the data
2. Relevance with respect to the tackled subject
• A representative illustration
• Appropriate geographic coverage
• Sensitivity to changes
3. Communication
• Relevance, resonance
• Simplicity
• Existence of a benchmark value
• Possibility of interregional or international comparison
• Potential use within the framework of prospective scenarios

able difficulties in fulfilling all these demands. Abiding to them strictly, would only lead to a list of indicators insufficient to document the scope of concerns tourism raises with regards to sustainable development. It is certainly challenging and useful to keep all these requirements in mind but it is also necessary to remain aware that each of them has more or less importance according to the specific list of indicators that is being constructed and its expected use: if the matter is to reveal trends and follow them, the homogeneity of a series of measurements throughout time is indispensable. Since it is almost certain that any indicator that one can build will not possess all the ideal attributes, it is crucial to specify their range and the limits of their interpretation. While ideally an indicator should be entirely transparent without comment, in practice it is rarely sufficient.

Methodological frameworks and types of indicators

The construction of environmental indicators is based on the pressure–state–response framework which was first proposed by the OECD (1994) which had begun using it in the 1980s. The transparency of this approach is amenable to decision-makers. Meanwhile, it has found less favour among scientists, for whom it appears too mechanicist, too Newtonian and to be founded on a simplistic vision of causal links; it badly accounts for the complexity and uncertainty of knowledge that hallmarks environmental crises. The European Environmental Agency (EEA, 1998) proposed an improved framework: *driving forces* (economic and social factors or trends), *pressures, state, impact, response* (DPSIR). The social and economic tendencies draw attention to framing elements which are not directly related to the environment but which it is necessary to measure, so as to understand the evolution of the activity considered and the stakes related to sustainable development (for example, diminishing working time, demography, income increase, the Euro etc. when dealing with tourism). As far as the diagnosis is concerned, the distinction between *state* and *impact* makes it possible to separate the direct effects of the pressures (on the environment etc.) from their effects on communities.

Finally, in practice, constructing a set of indicators must necessarily start with the choice of an editorial line (Rechatin, 1999) which includes defining the following factors:

- Expected objectives: assessment of the main trends, public policies etc., help in decision-making, communication etc.
- The audience for which the indicators are built: civil servants who will require technical and detailed information, decision-makers, who usually demand highly synthetic information, an enlightened public (scientists), the general public.
- The type of desired product: complete sets of indicators or selected indicators, indicators just meant to feed traditional assessment reports. Indicators should not be defined with vague or imprecise objectives (either decision making, environmental assessment) but with regards to expected products and publications. Experience shows that the desired data for a specific project seldom match with those selected through general sets of indicators. Moreover, indicators should be considered as 'part of' an overall assessment process not as an objective by themselves.

In relation to this conceptual framework, various kinds of indicators can be defined according to their objectives or to the step which they inform: framing indicators, pressure, state, impacts, alert, response indicators. The assessment of public policies is related to a particular category of performance indicators which are intended to evaluate the efforts carried out to achieve a definite goal.[4]

The specificity of indicators related to sustainable development

Sustainable development created a new demand for indicators (Rechatin *et al.*, 1997) while augmenting the complexity of a debate which was less than stable. This new context requires some additional methodological precautions. SDIs must first translate both the normative and assessment dimensions of sustainable development.

From the normative point of view, sustainable development is a goal one seeks to reach, as defined by Agenda 21 and the Brundtland Report. The indicators will thus aim to estimate the progress towards this goal. This more or less takes for granted that there are agreed criteria for sustainability and non-sustainability, thereby restricting the debate.

The assessment perspective does not need an *a priori* definition of what sustainable development should be. Rather it is interested in societal trends, for example in seeing how the properties of the tourism system evolve (sensitivity to economic crises, capacity to react to changes in demand and to adapt to more restrictive transport policies etc.). This does not imply value judgements and the SDIs are supposed to contribute objective assistance to the decision-making process.

Owing to the controversies on what sustainable development should be, and to the absence of a normative vision shared by all (Theys, 1999) (despite the lip service accorded to Agenda 21 at the international level), the current approaches mix the two points of view. It, therefore, follows that the subjectivity usually carried by indicators is rather inevitable with SDIs. Building indicators implies an implicit or explicit reference to a 'model', i.e. to a vision of sustainable development which translates this subjectivity. This point is especially relevant as the concepts of sustainable development can diverge, as much among theorists ('strong', 'weak' sustainability etc.) (Neumayer, 1999; Turner, 1993, 1998) as among stakeholders. The Brundtland Report can provide a starting basis which is very broad and is thus far from sufficient to allow discrimination between all the choices which arise.

In addition, these two attitudes, normative and assessing, induce very different procedures when devising SDIs. If there is agreement on sustainability standards or an assessment methodology, it is possible to propose a limited number of indicators which will clarify the decision-making process. If there is no such agreement, it will be necessary to set up a more participative procedure, in which the stakeholders will be questioned on their point of view regarding sustainable development and on their priorities.

Another source of confusion comes from the lack of distinction between *internal* and *external* points of view on sustainable development.

- 'Internal' priorities are related to such questions as 'What is the profitability of tourism?'; 'Whom does it profit?'; 'Does it lead to local environmental

problems?'; and 'How is it accepted by the local community and integrated in its way of life?'.

- Some priorities can be 'external' to the territory and its businesses. A local activity can induce impacts beyond its territory. Does local tourism threaten species which are protected at the national level? Does it compete for the use of water with activities located in the same river basin? Does the territory or business contribute to the cohesion of the national community by accommodating underprivileged people during the holidays etc.?

Even if one admits that sustainable development essentially refers to global environmental and development issues (e.g. global warming, desertification, poverty), nevertheless it still directs inquiry at all actors and economic activities: States, local authorities, business, cities, . . . all these stakeholders will inevitably have different approaches with regards to development: a holiday resort, a state and a large company can see sustainable development in very different ways. Stakeholders will not identify the same priorities: a holiday resort will pay more attention to its landscapes whereas a community in an open field area will be worried by the quality of its drinking water. In the case of tourism, it is not only necessary to assess the sustainability of tourism regarding its own objectives and priorities (e.g. avoiding the destruction of the resources on which tourism is based) but also to evaluate its support for development objectives and global environmental management which are presently seen as external to the tourist system (travel intensity or energy consumption of tourism, both of which contribute to global warming, impacts on communities and cultures, conflicts with other economic activities etc.). Keeping a balance between these internal and external dimensions is necessary: dealing only with international aspects is likely to discourage local actors or businesses and prevent them from adopting the concept of sustainable development. Focusing only on local concerns will direct the thinking on miscellaneous local issues, thus neglecting global issues which are more specific to sustainable development (Levarlet, 1999). As a consequence, one might produce SDIs without referring to the theory and to normative character of sustainable development which will lead to local or sector-based information systems for the environment and development, without any link between them and without reference to common goals borne out at multiple scales (Sharpley, 2000).

The constraint is thus to account for the common stakes raised by sustainable development and the interests of the actors for whom the indicators are built. In practice, it is sometimes possible to translate a global problem into local considerations, so as to draw the attention of local or sector stakeholders to long-term risks, using such indicators as the 'impact of global warming on the snow cover'. This is, as Christophe Bouni (1998) states, 'mobilising needs to concretise principles'. But in other cases, tourism will directly contribute to environmental problems without any direct negative feedback (Hoyer, 2000). The tourists who go to the Riviera contribute, for example, to the greenhouse effect through their travel. But how is it possible to address local stakeholders on a subject which does not threaten them in any way, at least in the short or medium term or when impacts or emissions take place outside one's home region? One can certainly try to show that global and local issues are linked, i.e. underline for example that the tourists

who come by car contribute to the resort's traffic jams and parking problems, and try to convince them to come by train or bus rather than the aeroplane as it uses too much energy – but examples have shown this advice goes unheeded. Some environmental problems (the use of natural areas for example) appear as externalities of the tourist activity; they neither affect the tourists directly nor the operators and have impacts on groups, institutions or entities which are not represented in the decision-making process. Those who are in charge of building a set of SDIs thus have the responsibility of taking the interests of absent third parties (future generations, natural habitats, any group likely to undergo the negative impacts of tourism) into account.

Accounting for the diversity of situations while keeping a common reference, to assess issues without closing the debate on the question of sustainability (but nevertheless clarifying the assumptions behind each stakeholder's views), to find a balance between a top-down and a bottom-up approach – constructing SDIs has similarities with the art of a tightrope walker.

Sustainable Development Indicators in the Field of Tourism: A Study of Current Attempts

In the field of tourism a certain number of attempts to build SDIs have been carried out: we shall describe several of them. Generally, in these works, it is difficult to identify the gap, mentioned earlier, between academic approaches and the work of governmental or international institutions. Expertise and academic work are here generally linked to institutions who initiate programmes employing researchers either at the international level (e.g. the World Tourism Organisation) or at the national level (Agence Française de l'Ingenierie Touristique, 2001; Levarlet, 1999). This lack of autonomy is probably due to the weakness of alternative thinking on tourism itself (Hunter, 1995; Sharpley, 2000) – contrary to what occurs for example on environmental issues – and on the tourism–environment interface in particular: the questioning to which the concept of sustainable development could lead is therefore somewhat limited (McKercher, 1993).

Practical difficulties in implementing indicators

The Plan Bleu (1997) gathered preceding works on SDI for tourism. This collection goes back to 1981. The indicators quoted by the Plan Bleu appear often trivial,[5] unrealistic[6] and subject to criticism.[7]

The main change in recent years has been a progressive slide from traditional economic or environmental indicators to more holistic approaches, combining and trying to achieve some consistency between economic, social and environmental topics.

A group of experts led by Edward Manning published for the WTO a practical guide to indicators of sustainable tourism, 'intended for those who deal directly with the planning and the management of the national and regional tourist development, and for those which are directly responsible for the management of given destinations' (Consulting and Audit Canada, 1995: 3). This work presents two series of indicators: fundamental indicators for sustainable tourism (Table 2) and indicators specific to each type of destination (seaside, parks) etc.

Table 2 Fundamental indicators of sustainable tourism (WTO, 1997)

Indicator	*Specific measuring instruments*
Site protection	Category of protection of the site according to the index of the UICN
Pressure	Number of tourists visiting the site (by year/ month)
Intensity of use	Intensity of use in peak period (people/hectare)
Social impact	Ratio tourists/inhabitants (average and in peak period)
Development control	Existence of a procedure to study the environment or of true controls of planning and density of use
Waste management	Percentage of waste water treated
Planning process	Existence of a systematic plan for the area of the tourist destination (including a ' tourism ') component
Fragile ecosystems	Number of rare or threatened species
Consumer satisfaction	Degree of satisfaction of the visitors (according to a questionnaire)
Satisfaction of the inhabitants	Degree of satisfaction of the inhabitants (according to a questionnaire)
Contribution of tourism to the local economy	Proportion of the global economic activity due solely to tourism
Composite indexes	
Carrying capacity	Composite measuring instrument warning on the state of key factors influencing the capacity of the site to handle various levels of tourism
Site disturbance	Composite measuring instrument of impact levels on the site (i.e. on its natural and cultural characteristics under the pressure of the added constraints of tourism and other sectors)
Interest	Qualitative measuring instrument of the characteristics of the site which make it attractive for tourism and which can change in time

Some of the indicators do not seem easy to implement: for instance, even in a country possessing a sophisticated statistical system, it is impossible, for instance, to identify the part tourism plays in the turnover of economic activities such as restaurants, transports etc.

Other indicators are obviously difficult or impossible to quantify and the debate raised is whether you can describe as an indicator an information which is not quantified and includes a strong amount of subjective appreciation, even if that subjectivity is hidden by a classification on a scale from 1 to 5. It is the case for ' development control' where point '1 means there is no control on development while the gradually higher marks correspond to a proportional increase in the degree of control and its effectiveness' (Consulting and Audit Canada, 1995: 15; WTO, 1997).

The quest for concrete results and its implications

It can be seen that the current global approaches, however legitimate they are, suggest indicators which are imprecise, difficult or even impossible to quantify, i.e. problems of the availability of data, for a moment forgotten in passionate brainstorming sessions, soon reappear when it comes to practical construction. This type of shortcoming is the reason why statisticians, engineers, or civil servants who have less abstract views than academic researchers or international organisations call for what they figure as concrete and reliable results. This is the background to several sets of indicators such as the American Environmental Protection Agency (EPA) work concerning tourism at a national level or the environment charter of the ACCOR conglomerate, which concerns one particular type of stakeholder and is to be applied at the level of production units.

EPA's work (2001) aims to establish a method for building indicators of the direct environmental and economic impacts for various tourism/recreation subsectors (lodging, retail, restaurants, transportation and specific activities linked to tourism; the topics are: expenditure, greenhouse gases, air pollution, water use, solid waste, energy, waste water and 'other environmental and economic indicators (for future analysis)'). The work has been completed for a certain number of activities – skiing, fishing, hunting, boating, golf, casino gaming, amusement/theme parks, historic/cultural attractions, conventions and conferences, and waterside recreation and figures have been produced for these (EPA, 2001: 38 ff). The indicators are thus: number of participants, number of trips, expenditures, water use (million gallons/year), waste water (t/year), energy use (billions btu/year), transportation energy use, municipal waste (tonnes/year), air emissions (hydrocarbons, CO, NOx, CO_2 equivalent). Furthermore, the global environmental impact of tourism at the national level has also been estimated. A detailed methodology is provided by the authors. Since the reliability depends on this data collection and processing, this methodological documentation should be a common rule in indicator works. The method here is based upon a search of such ratios as water consumption by overnight stay in hotels or CO_2 emissions by passenger.km travelled. EPA's work is a considerable attempt to monitor the environmental footprint of tourism at a national level. However, the methodology provided reveals a lack of ratios really specific to tourist activities and equipment, which, beyond the seemingly impressive results, undermines the outcome of this work. Moreover, strong hypotheses are made that might lead to the wrong conclusion: the longer the stay is (e.g. longer in waterside recreation than in casino gambling), the more important the environmental impact is, which might lead the conclusion that shorter stays are better, although the need to reduce the intensity of tourism transports should lead to incentives for longer stays (and less frequent departures).

The work completed by ACCOR (1998) deals in an extremely concrete and practical way with the following issues: energy and water consumption, waste, asbestos, the landscape. The document provides hotels with methods that enable them to describe their situation and to compare it with standards which can vary widely according to class and comfort.[8] The guide provides advice to improve the initial situation.

Both of these documents wish to abide by available data. This leads to a restric-

tive view of environmental issues, excluding those which are difficult to quantify, at least at certain geographical levels. For instance the EPA document does not tackle the landscape issue though it is one of the major environmental problems linked to tourism development. This contrasts with the more local level ACCOR accounts. The EPA scope, i.e. restricted to the environment, is clear and certainly assumed with the ACCOR document[9] which can nevertheless be relevantly criticised for not paying attention to global environmental problems. EPA's document does refer to some economic issues but the provided figures are more contextual data which aim to characterise the importance of each sub sector rather than an attempt to account for the economic dimensions of sustainable development.

It is certainly necessary to pay attention to the reliability of data but this calls for two comments. First, data which are usually presumed reliable may well offer unexpected margins of error which their producers seldom put forward.[10] Some less official data are not necessarily less reliable and can therefore be used as indicators of tourism phenomena. Combining different data (tourist and non-tourist, for instance the maps of local accommodation and protected areas, or noisy areas or intensive agriculture) can also reveal a lot about the sustainability of tourism. Besides, one should abandon the illusion of perfect information systems in all fields. Defining indicators requires a high level of exigency while implementing them requires a high level of pragmatism. A scientist, an expert or a manager must be aware of the lack of data s/he will have to face. All kinds of data are useful in an assesment process. The search for reliable data should begin during the definition of indicators (Cammarrota *et al.*, 1997)

The difficulties encountered with the data suggest we categorise the indicators we have met in the various works into four:

- indicators which have very little to do with tourism and sustainable development (the area, the population of a country etc.);
- potentially interesting basic data for which the bridge between sustainable development and tourism is not correlated (number of threatened species etc.);
- indicators for which that link is expressed but remains impossible to quantify or to assess qualitatively in a reasonable manner; and
- genuine sustainable tourism indicators which link tourism and sustainable development and can be quantified or assessed qualitatively with existing information.

The work done by Ifen (Rechatin *et al.*, 2000) though it only deals with the environmental aspect of sustainable development tried to abide by the two requirements concerning the reliability of data and the linkage of tourism to sustainable development issues. It combines a national approach (excluding French overseas territories) and a territorial approach (coastal, mountain regions, countryside, cities). The aim is clearly an assessment of the current situation. The indicators deal with tourist flows and their concentration in space and time to clarify the environmental consequences of tourist transport and length of stays (space, energy, water consumption, production of waste, pollution and other harmful effects). The requirements regarding data can exclude important issues such as the impact of French tourists abroad (whereas the impact of foreign tourists in

France is documented). The geographical scale and the focus on the environment are comparable to EPA's work but the outcome is quite different. Ifen encompasses much broader issues. The data used come from miscellaneous horizons, they are not limited to environmental impact data coming from environmental data bases: data concerning agriculture, landscape and the impact other than of transport energy have been used. These have been confronted with the trends in tourist activities which appear to threaten environmental sustainability (increase in short trips, overwhelming use of cars in travel etc.).

Linking the assessment procedures to sustainable development strategies: Public policies versus self-regulation?

The practical difficulties of implementing indicators are also the core of Middleton and Sieber's (1999) work for the European Environment Agency: 'Tourism and the Environment at European level. A Practical Framework for Assessing the Issues with Particular Reference to Coastal Mediterranean and Alpine Regions' The authors allude to the impossibility of creating throughout Europe, on a national scale, a set of indicators making a comparison among countries possible: 'many highly desirable indicators have to be rejected because they cannot be made operational and comparable on an European basis or because a simple question cannot be phrased to produce a statistically reliable response' (p. 15). They think it necessary to start from the level of the firm and of major tourist destinations to implement indicators which could more practically be used: 'We deliberately target the three main sectors of larger hotels, larger tour operators and larger visitors attractions . . . when reliable measures in these three sectors are established, it will be relatively easy to expand and extend the scope of a European framework to embrace more sectors' (p. 15). They establish a list of indicators for each targeted sector and recommend dealing with larger size stakeholders first, for example tour operators sending more than 10,000 people to one resort or sites seen by more than 50,000 people (see Table 3). Implementing and putting figures to the indicators remains to be done.

These methodological choices regarding SDIs for tourism are not only technical choices. They also affect, lead to or suggest strategies for future tourism sustainable development policies (Williams & Montanari, 1999). Victor Middleton's approach, similar in his other publications (Middleton, 1998) explicitly calls for self–regulation of the tourist sector:

> Although local authorities are the chosen institutions for the exercise of statutory and regulatory powers, there is an increasing recognition that forms of self regulation through voluntary initiatives by commercial enterprises will be a vital element of any successful development and implementation of more sustainable practice. Public sector/private sector collaboration at local level provides the essential forum for the effective development of self-regulation alongside regulatory powers (Middleton & Sieber, 1999: 11).

Indeed, the priorities which are embedded in the construction of indicators also depend on the importance allocated to the various stakes and to the governance of tourism in a prospect of sustainable development. Should one focus on commercial operations or on the territories? What part should the state and inter-

Table 3 Indicators for visitors attractions

1. Significance of role in communicating/interpreting one or more aspects of the local environment through the attraction . . .
2. Formal (published) statement of commitment to the environment . . .
3. Targets and programmes set annually with an agreed formal system in place for monitoring and recording on file:
   - Energy consumption (kWh $1m^2$)
   - water consumption (volume by visitor)
   - waste water treatment (percentage of re-use)
   - percentage of sewage/waste water treated through municipal facility or privately owned plant . . .
   - purchase of environmentally friendly chemical products . . . and safe disposal of hazardous waste
   - volume of waste sent to landfill (weight per visitor)
   - formal programme in place to purchase local food and other supplies . . .
   - program in place for local community involvement and environmental conservation (money, staff-time, materials)
   - local community employees as percentage of total full and part time work force
4. Regular use of CSQs with questions on customers satisfaction with the environmental aspects of visits
5. Representation on a local tourism forum . . .
6. Specific provision for transports other than cars . . .
7. Membership of eco-label or other environment award . . . financial contribution made annually to local environment conservation . . .

Source: Middleton & Sieber, 1999: 18

national organisations play? What should be left to voluntary initiatives and how far should constraining measures go? Middleton and Siebers' suggestions lead us to fear that issues which are not relevant or perceptible at the local or commercial level might be dismissed or overlooked (Forsyth, 1997: 274). Among these issues, one can point to the assessment of territorial and seasonal tourist concentrations, which must also be seen and dealt with at a national level since they both are determined by the localisation policies of the larger operators and also determine public transport policies and their impacts on the environment: focusing exclusively on the local level does not allow these major trends of tourism on a national scale to be seen. The implementation of the 'right to holidays' and social tourism also call for national solidarity mechanisms (aids to building popular resorts or to the holidays of individuals) which are quite distinct from the concerns of the tourist managers in the resorts. The same applies to taking account the impact of tourism on global warming into account. These strategic considerations must influence the assessment methods. If self-regulation is chosen, and it is believed that most measures can be implemented by private operators, the firms should be encouraged towards self-assessment and to use indicators in that context. However, if one thinks that certain stakes (transport) can be dealt with only by national or European public authorities, the use of

national assessments and indicators at this level will appear unavoidable. Moreover, limiting the assessment to the local level would be to ignore the fact that the scale of tourist development has changed and that more and more it depends on the strategies of large world-wide companies (hotel conglomerates, tour operators), whose decision-making centres are largely external to the resorts. What is the sense of studying trends at the local level if it is known that this same level has no capacity to act on these trends?

Consequently, nation-wide data seem absolutely necessary to us to support future sustainable development policies and cannot be obtained other than through a national statistical approach. However once the stakes are clearly identified, it is clear that approaches focusing on stakeholders and the various territories are fully legitimate. The various works carried out in this context show very variable results.

Stakeholders and territories

The Ecomost project (European Community Models of Sustainable Tourism) monitored by the International Federation of Tour Operators (1994) focuses on stakeholders. It presents a list of indicators concerning the local environment and the long-term sustainability of the profitability of the tourist activity, with topics like safeguarding economic effectiveness, the prosperity of local residents, their cultural identity, the upgrading of accommodation etc. This logic remains rather professional (referring to the 'internal' aspect of sustainable development as mentioned earlier) and the environment is, for the most part, taken into account only when it is likely to question the development of the resort.

In contrast, the approach of 'the check list for tour operators' developed by the German Monitoring Association (Boers & Bosch, 1994: 137–42) focuses on territories; it is concerned with the external impacts of tourism and recommends tour operators limit some of their practices so as to take into account their impact on the environment. Among the items, one can find: the preference given to low season periods so as to limit concentrations, to nearby destinations so as to decrease transport and also the concern to avoid air transport for short journeys, to use means of transport and practise activities less intensive in energy use (avoiding helicopters, water skiing), to encourage the use of less polluting vehicles, to privilege small size and not too luxurious accommodation and to buy local products.

Such works show that to assess themselves regarding sustainable development, each category of stakeholders does not need the same set of indicators: (1) because they all are not challenged by the same issues and (2), and this is partially linked with the first, because their priorities are not the same. However, is it necessary to build a set of indicators for each type of stakeholder? That can be the case if the focus is really on the stakeholders: for example if one concentrates on hotels, it will undoubtedly be interesting to compare water or energy consumption etc. throughout the country and to compare these with given standards.[11] If one is interested in a territory, a dialogue and confrontation between the various categories of stakeholders, each with their own concerns and priorities will have to be organised. It will thus be necessary at the same time to start from a territorial specificity which exceeds the concerns of each category of stakeholders and to take these into account. Practically, this results in the working out a set of indica-

tors centred on the problems identified for a particular territory; this selection will already deal with a good number of dimensions of interest to the various stakeholders (keeping an eye on the quality of the rivers on the territory is of some interest to the professionals who hire canoes etc.); and it will be supplemented by a certain number of indicators specific to particular categories of stakeholders.

The work of the Agence Française pour l'Ingénierie Touristique (Afit, 2001) focuses on both territories and stakeholders. The aim here is to develop a guide allowing the territories[12] and their tourist businesses to assess their situation as regards sustainable development (with four dimensions: environment, economy, social and ethical) and to progress in this direction. The assessment process corresponds to the territories in an attempt to evaluate and if possible to quantify the problems selected. This phase is not an end in itself and is only part of the global process on the way to sustainable development. It must, in particular, be prepared by identifying the stakes concerning sustainable development in the territory (which are not limited to the tourist sector) and by the choosing a relevant territory (boundaries of the resort, the rural area studied), then followed by an analysis of the diversity of perceptions about tourist development in the territory, all this before thinking of an action plan. This supposes that tourism is not only assessed within a commercial enterprise logic (profitability of the resort) but also with regard to objectives which are not usually addressed, such as water management, air pollution, sensitivity to the crises and factors of weakness of the destination in the long term, distribution of the incomes from tourism in the local economy, economic diversity. Some of these topics are well known, others are just emerging and will need new means of evaluation.The core of the exercise is the method designed to guide the various stakeholders of a territory on the path towards a more sustainable development; the place of indicators appears instrumental in this respect and rather secondary.[13]

The Afit work makes it clear that the choice of indicators depends on the territorial scale to be investigated, i.e. whether it is international, national, regional or local. The problems and priorities vary, as does the availability of data.[14] The capacity of sets of SDIs (whether or not applied to tourism) built by international organisations (UNO, UNEP, WTO) (Ifen, 1998) to match with the reality of any country is already problematic but the smaller the geographical scale, the more this discrepancy appears.

Criteria, benchmark values

Finally, it is critical to permit the users of a set of indicators both to situate themselves easily into the assessment process of which the indicators are only part, and to be able to interpret the values the indicators take in the particular case on which they are working.

The national working group set up by Afit established an editorial line using a set of *criteria*.[15] These criteria, which are suggested to the experimental territories, guide the assessment process. They must be understood as objectives that the territories should seek to reach in the medium term to set their tourism on the path to sustainable development.

So that the indicators can be usefully interpreted, Afit has also tried to set *benchmark values*, to which the territories (or their firms) can compare themselves.

Should one recommend a resort to widen its tourist season, and to start by evaluating its present length, it is necessary to enable it to evaluate its potential of improvement by providing the average values for its region or for France. The same applies, for example, for the length of stays tourist average expenditure, the contribution of tourism to the water consumption of the territory. What we name *benchmark values* is not exactly tantamount to standards, in the sense that the former do not always stem from a normative approach but can merely express an observation (see also Policarpo, 2001).

Both Ifen and Afit attempt to produce data specific to tourism and distinguish the framing data and indicators. The framing data will, for example, refer to the rate of overall unemployment of the territory; the corresponding indicator will be the rate of unemployment in the jobs related to tourism. Abiding by already known data without seeking an added value would just mean forgetting that one of the aims of building indicators is precisely to contribute to the improvement of the information systems in tourism. This objective is clearly apparent in the work of Afit, which exposes methodologies for defining some indicators even if it is known pertinently that the data will not be available on the studied territory but could possibly be collected. The aim is to foster a ground level effort to collect data or to start specific new inquiries relevant to sustainable development issues.

Recent works (Ceron and Dubois, 2002; Ivars Baidel, 2001; Policarpo, 2001; Spanish Ministry of the Environment, 2002) underscore the need to introduce filters in order to prioritise issues of concern. The Spanish Ministry of the Environment gathered experts to discuss issues which should be assessed first at national level and for selected tourist spaces (coastal areas . . .), with regards to such criteria as impact, degree of responsibility of the tourism sector, degree of reversibility of the impact, degree of extension. Policarpo exclusively used the impact criteria and Afit (Ceron & Dubois, 2002) introduced a preliminary assessment through administering a questionnaire. This step of the process seems particularly suitable for associating decision-makers with the sustainability assessment. It requires the definition of an adapted procedure, so as to warrant the neutrality of the project manager in the selection of priorities. With the help of this method an exhaustive list of indicators can be provided as a toolbox, within which each category of stakeholders will concentrate on the calculation of selected ones.

Medium-term Prospects

Possible illusions and drifts

Earlier in this paper, we have described the historical context of the demand for indicators and linked this to the concept of sustainable development. We have reviewed recent works on the subject and pointed out the difficulties encountered when building sets of indicators. Given this state of the art, the question that stems from this is: What help can be reasonably expected from indicators and what goals could be set to improve this tool in the years to come?

We will start by warning against some possible illusions and drifts. The first is that of a certain planning utopia – that indicators can provide a decisive instrument making it possible to control the evolution of tourist activity and thus to direct it towards sustainable development. The illusion is here twofold: on the

one hand, because the tool is far from being reliable; and on the other hand, because it cannot substitute for political action. The wish to master the future currently meets with an increased will to control public action. Everything is assessed and controlled, yet this approach denies the fact that a certain inaccuracy, some slack is required in order to leave some initiative to the grassroots policy level in order for organisations to work properly. In such a context, 'certified' sustainable development indicators could well become a new vector of the power of upper-level bureaucracies, subordinating their aid and funding to the construction of sets of indicators . The prospect for the translation of SDIs for tourist operators into a formal EEC directive, called for in the work of Middleton for the EEA, should be appreciated in this context: 'with experience and success, and given the vital importance of sustainable development within overall EU Policy, it may be judged appropriate in the future to develop the framework into a formal Directive' (Middleton & Sieber, 1999: 24). The danger is that ground level stakeholders or communities might simply pay lip service to what they could perceive as bureaucratic demands and give them the conventional answers these authorities expect, to the detriment of dealing with the issues.

In the same way, it is necessary to beware that the debates around sustainable development do not give rise among grassroots stakeholders to misrepresented requests driven by the desire to obtain grants or to create a public image.

To avoid this it is necessary to recall the basic contents of sustainable development but without allowing excessive expectations regarding the use of indicators to develop. The users, but also some theoreticians, often insist on limiting the number of indicators which should, moreover, be readily usable: in short the idea is that decision can be guided by a few ratios. One of the major dilemmas with indicators is that, on the one hand, it is desireable to have access to a wide realm of indicators that can describe reality in an accurate manner, in spite of the complexity that it generates; but, on the other hand, one wishes to have all this in the most concise possible form, ideally a single index, in spite of the distortions of results which this simplification imposes. It is certainly necessary to limit the number of indicators. The studies we surveyed (see, in particular, the work for Ifen which only deals with the environmental dimension of sustainable development) convinced us that even under a hundred indicators for a territory already necessitates some serious thinning out (unless aggregation into indexes is accepted with all its drawbacks). Indicators imply their users invest some time and thought; this should not be underemphasised.

Directions for further research

After these warnings, one could wonder how these tools could be improved. Future works on this subject should comply with following requirements:

- to assess the quality of the data on which SDIs are built better, which is especially true in the field of tourism;
- to collect new data informing some important aspects of sustainable development on which it is not currently possible to build indicators (the scope of this recommendation will of course be drastically limited by the cost of the information);

- to draw the lessons from the work already carried out and highlight the existing lack of data, so as to contribute to the improvement of the information systems on tourism;
- to make the indicators more easily understandable and user friendly (for example the search for benchmark values or the attempts of Ifen to work on the communication aspect of indicators seems to head in this direction);
- to define more precisely:
- the expected objectives of a set of indicators: communication – awareness raising, evaluation, policy performance measurement, monitoring,
- its expected audience: business, institutional, general public,
- the scale for which it should be considered as relevant (local, national, international), and the limits of its validity and
- the detailed methodological (data sources, data processing etc.) notes that should be provided in any publications.

Beyond this improvement of existing tools, further research should concentrate on a core set of indicators in a sustainability perspective. Indeed, as explained before, the research on sustainability in the field of tourism has taken various directions sometimes very distant from the orginal inspiration of the Rio conference. This means exploring the link between sustainability and tourism at the global scale and for critical issues.

- The sustainability of a specific activity can only be finally evaluated at a global scale. It is somehow surprising that although many assessments at local or national scale have been carried out, no attempt has yet been made at a global scale. However, data exist at a global scale (tourism flows, receipts, transportation, environmental impacts etc.), which could be used to address such issues as the impact of tourism on global warming and biodiversity, its contribution to development etc. The WTO has supported an SDI programme for destinations since 1996: a global evaluation based upon indicators could be another interesting framework.
- Some critical issues need data improvement. The question of global warming, due to its complex relationships to tourism (tourism contributes to global warming and global warming threatens tourism), needs further research, in the context of a very low level of awareness of this problem among stakeholders. The relationship between biodiversity and tourism was underlined during the International Year of Ecotourism in 2002. However, very few quantified evaluations of the positive and negative impacts of tourism on biodiversity exist, both on the local scale and on broader ones. The Convention on Biological Diversity could be a very appropriate stakeholder to undertake such research.
- Considering the current trend towards self-regulation in the field of tourism, through ecolabelling and certification, a priority should be given to the definition of criteria and benchmark values to monitor ecolabelling. In that perpective, the elaboration of ratios (such as water consumption or CO_2 emissions per overnight stays) should reinforce the strength of labels but also provide data for the elaboration of future standards.

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Notes

1. Nevertheless, as we have previously argued (Dubois, 2001), the lines following the famous definition quoted here are far less general and consensual when they state that '[sustainable development] contains within it two key concepts: the concept of 'needs', in particular needs of the world's poor, to which overriding priorities should be given'; and the idea of 'limitations imposed by the state of technology and social organisation on the environment's ability to meet present and future needs'. However, authors seldom refer to them.
2. They refer to industries on an aggregated basis which does not permit to tourism to be distinguished from the others.
3. They generally express a significance which exceeds their value or state, only if the context remains unchanged.
4. Performance indicators are themselves divided into several categories: result indicators (including state and pressure indicators), response indicators (including efficiency, means and process indicators) (Rechatin, 1999: 62)
5. For example, Surface, population, density, total accommodation, accommodation in hotels . . . Total number of tourists, number of foreign tourists etc. (Plan Bleu, 1997: 11).
6. For example, Impact (I) of tourism on the environment of a location (M) (Plan Bleu, 1997: 5):
   $I(M) = (F(M)\ k + C(M)\ k')\ m$, where
   $F(M)$ = stays in location M;
   $C(M)$ = spatial concentration of tourist equipments and accommodation in the location (number, size, capacity).
   k is the qualitative coefficient relating to tourists' behaviour . . . obtained by crossing in a matrix the natural characteristics of the location with stakeholders (traffic, equipments, leisure activities). The impacts are then quantified using the following formula: (impact on the environment + impact on heritage) (index of reversibility – irreversibility of the impact).
   k', for the equipment is obtained by the same way.
   m is the vulnerability of the environment.
   Our translation: environment stands for 'milieu', heritage for 'patrimoine'.
7. Those related to carrying capacity for example (Ceron, 1998; Deprest, 1997: 39–59 and 153–9).
8. This recalls that sustainability is not only a matter of technique but also questions ways of life.
9. The firm has a social policy which can be somewhat related to the social dimension of sustainable development but it is expressed in other forums.
10. The way the turnover of tourist activities is built into French and WTO statistics can illustrate this: in French statistics for instance it includes the whole of restaurants turnover whereas less than half is due to tourism; the margin of error on the number of international trips is also very high,
11. See for example the ACCOR charter.
12. The geographical scale is that of a resort or of a territory with some tourist appeal.
13. Can be regarded here as an indicator the qualitative answer of an expert or the appreciation of an investigator.
14. Our work, with AFIT has shown us that data available at a national level are far from being always possible to split to the regional level and never at a resort level. Data at

the level of territories, when they exist , are usually collected according to very diverse methods. It is thus not easy for a location to compare itself neither to others nor to larger spaces.

15. such as for example 'promoting energy savings and alternative energies in tourist accommodation', 'diminishing the contribution of local tourism to air pollution', 'improvement of working conditions in the tourist industry' etc.
16. Moldan, Adriaanse, Bartelmus, Dahl, Hammond, Meadows, Parikh, Winograd.

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