

Measuring Sustainable Tourism (MST): Developing a statistical framework for sustainable tourism

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MEASURING SUSTAINABLE TOURISM AT SUB-NATIONAL AND DESTINATION LEVEL

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1. Introduction – the spatial measurement challenge

The development of sustainable tourism policy advice and indicators has long been targeted at the destination level. There are a number of motivations for this. First, the challenge of balancing outcomes across the social, environmental and economic dimensions of sustainable tourism is revealed clearly when considered in relation to a relatively small spatial area. Indeed, the concerns of individual communities, of local economies and of specific environmental features, may be hidden if considered at larger, national scales. Of course, this is not solely an issue for tourism and applies in many areas where the spatial distribution of people and resources is a key factor in outcomes.

Second, the potential to make specific changes to visitor activity and the development of tourism industries is likely to lie most clearly in the hands of local agencies, for example in terms of development planning, determining access and managing visitor flows. This is also true in other areas of activity although in other areas such as education, health and development programs there may be a stronger influence of national policy particularly in relation to the finances and resources.

Third, although there may be common elements across destinations, each destination is in some way unique and hence there is a need to develop indicators and policy that take into account that uniqueness.

Notwithstanding these motivations, the development of tourism statistics has focused on the compilation of data at national level. This has been driven by two main factors. First, the area of tourism statistics has generally been implemented by national agencies, commonly a national statistics office (NSO) which has a primary duty for the provision of information to inform national governments, for example Ministries of Economy, Planning, Development and Tourism, Central Banks and other agencies such as tourism authorities. Second, NSO are tasked with providing data that is consistent across a country applying standardized methods and definitions and enabling comparison across countries.

The need to provide information from different spatial perspectives is real but not unique to tourism. Indeed, the same tension can be recognized throughout the history of measurement of sustainable development. For example, the European Environment Agency (EEA) has noted that “responses to sustainability challenges are dispersed across EU legislation and policies, while the evidence base to track progress is still fragmented (EEA,

2015). At national and international level, there are no integrated statistical frameworks for the measurement of all dimensions of sustainable development. In place of such frameworks are various sets of indicators covering the different dimensions. In parallel a vast array of indicator sets for sustainable development have been established at community, city, regional and other sub-national levels, acknowledging the reality that sustainable development at its heart requires “thinking global, acting local”.

This is not to say that the official statistics community has not been present in the development of sub-national statistics. There are many examples in which sub-national, often very detailed data are regularly produced for specific datasets. Perhaps the best example is information from population censuses which are routinely provided at very detailed spatial levels. However, on the whole, the development of sub-national statistics has occurred on a data set by data set basis rather than in an integrated manner across data sets.

More recently, as statistics offices have increased their use of administrative data and also progressed towards geocoding of statistical outputs the potential to develop sub-national data has increased. These developments, which continue to gather pace, are important drivers of the work to be discussed here. The challenge remains however to consider how these advances in data might be harnessed when considering multiple datasets. The provision of fine level detail for individual data sets without consideration of how they relate to each other leaves unmet the challenge of telling an overall picture about a specific destination or community. This is particularly true in the integration of environmental information with socio-economic data.

In advancing the MST, it is not considered sufficient to articulate the integration of information across the sustainable development themes at a national level. This task is important, for reasons explained below, but it is equally necessary to investigate how statistics can be integrated at sub-national and destination level. Without taking this step, the resulting information will be of far more limited value in the understanding of the sustainability of tourism activity and in developing appropriate responses to revealed imbalances and constraints.

Importantly, the challenge just described is not newly recognized. The INRouTe program of work has been ongoing for the past 4 years to discuss the relevant issues. It aims to support the management of subnational and local tourism destinations by providing and disseminating knowledge and best practices in the following research areas: flows of visitors, economic contributions, and tourism & territory. As such, INRouTe can support tourism destination management by establishing an agenda for the measurement and economic analysis of tourism to guide policy and decision-making. Key topics in this respect are the definition of observation and analytical units, procedures for monitoring and evaluation, and the design of indicator systems.

In addition, the UNWTO’s International Network of Sustainable Tourism Observatories (INSTO) brings together tourism observatories from around the world. Tourism observatories have been established in many destinations with the aim to better understand, monitor and advise on policy towards more sustainable development of tourism. The design, implementation and analysis of indicators are a fundamental part of their work. INSTO proposes an institutional framework, nine issue areas considered to be of highest relevance to observatories, and an economic data sheet for reporting. It encourages the systematic application of monitoring, evaluation and information management techniques, as key tools for the formulation and implementation of sustainable tourism policies, strategies, plans and management processes.

With these drivers and projects in mind, this paper describes some potential pathways towards sub-national statistical integration for the purpose of measuring sustainable tourism. The pathways discussed here build on the framing of sustainable tourism from Discussion paper #1, the potential integration of data in Discussion paper #2, and the role of statistical and accounting frameworks in Discussion paper #3. Section 2 of this paper discusses the issues that arise in determining the appropriate spatial resolution and associated measurement boundaries for statistical information and policy analysis. The following sections (3-7) outline five measurement pathways for sub-national and destination level data:

- i. tourism businesses and their key characteristics
- ii. tourism activity and visitor expenditure
- iii. environmental flows
- iv. environmental assets and other infrastructure
- v. accounting for ecosystems

Ultimately, the aim is to provide a richer information base to place tourism activity in its spatial context, and to support better understanding of the balance between economy, society and environment. At the same time, the aim is also to provide a means to see each location in relation to national and international situations. Ideally, a statistical framework should permit the uniqueness of each location to be reflected within an overall framework.

2. Spatial resolution and boundaries

The common focus in considering spatial resolution in statistics and measurement is to understand the level of spatial detail that is available for specific data sets. The level of detail available will vary depending on a range of factors noted below in Box 1 and it will be the case that compiling data sets with detailed spatial information will not be a straightforward task.

However, the more challenging task is to appropriately establish the boundaries to be the focus of measurement, accounting and analysis. This matters because the aim in measuring sustainable tourism is to integrate information from multiple datasets. Consequently, even if different datasets can be compiled at fine spatial levels, unless there is a common understanding of the area/s of focus and the spatial boundaries are delineated consistently between datasets, the comparison between data sets will be negatively affected. This section does not resolve this issue but describes relevant considerations.

Box 1: Factors affecting the compilation of spatial data sets

- The way in which the data have been collected (e.g. via survey, census, from administrative data, from remote sensing and satellite data)
- The way in which the data have been processed and aggregated. At fine spatial levels some information may not be available due to concerns about the confidentiality of the information.
- The extent to which the spatial boundaries used for measurement align to the boundaries of most interest to decision makers and analysts
- The extent to which it is possible to aggregate information to higher spatial levels, including national level and hence estimate relative shares.
- Whether it is possible to downscale or disaggregate national level information to finer level spatial areas.

The concept that has been adopted in the development of indicators and policy advice in sustainable tourism is that of destinations. Unfortunately, no standard has been established concerning the statistical measurement of tourism destinations. In part the lack of standardization is consistent with the general approach to sustainable tourism measurement in which the information requirements are determined based on the specific needs of stakeholders within a self-defined spatial area.

In defining a statistical framework this is not necessarily problematic because in theory a statistical framework can be applied at any level of spatial detail. In the first instance then the delineation of the spatial area should be a matter for deliberation among key stakeholders and users of information. Put differently, there is no specific conceptual limit on the number of destinations that may be delineated within a single country. Furthermore, one may want to have different levels of spatial details depending on the different domains.

However, since the aim is to place the information on all destinations within a country in a national context, it will be important to ensure that there is no overlap between different destinations, i.e. that the spatial area that defines one destination does not overlap with the spatial area of other destinations. This may be problematic in some instances if there are multiple destinations that are overlapping depending on the analytical or policy purpose. For example, for a large city some analysis may be most useful at the level of the entire city and surrounding region but other analysis might be appropriate for areas within a city, for example an historic old town.

From a practical perspective, socio-economic statistics will be most readily compiled at a sub-national level using administrative boundaries such as for cities, provinces and states. Environmental data on the other hand may be compiled using different boundaries such as water catchments or other resource management boundaries.

To the extent that the information to be compiled will be used by decision makers within levels of government, it will likely be useful to ensure that the spatial boundaries chosen for measurement can be linked to administrative boundaries – i.e. the spatial level chosen should be in terms of areas corresponding to sub-sets of or combinations of standard administrative boundaries. If a destination area crosses administrative boundaries the potential to integrate data may well be reduced, or at least the costs of integration are likely to rise.

There is increasing potential to develop or obtain datasets with information at fine spatial levels, e.g. through the geo-coding of business address information or the use of locational information inherent in administrative or other “big data” sources. As a result of these data developments, there is the potential to aggregate data to any agreed level of spatial detail. The potential for flexible aggregation is often highlighted as a solution to the spatial integration challenge. However, while these data developments are supportive, it remains essential to have a common understanding of the precise spatial area to which these fine level data will be aggregated for presentation and analysis.

A challenging conceptual issue to take into account in establishing the relevant spatial boundaries is identifying proper system boundaries for the description of the different connections to the visitor concerning environmental, economic and social aspects.¹ For example, the measurement of leakages requires an understanding of precisely which system boundary is relevant such that only flows that cross the boundary are considered leakages.

Another point is that it will be relevant to accept that not all questions will be able to be answered at a single spatial level – e.g. some aspects of transport infrastructure (e.g. airports and other transport hubs) are likely to be relevant to multiple destinations. Nonetheless, the exceptions should be identifiable. It would be appropriate for the statistical framework to provide specific advice in relation to different domains.

Finally, a general caveat on the potential to collate and disseminate spatial data concerns confidentiality. Standard practice in official statistics is to limit the release of information to ensure that individual businesses cannot be identified. Balancing the requirements for policy and analysis with the relevant confidentiality requirements will be an important consideration in determining the appropriate scale for sub-national statistics.

Notwithstanding these various challenges and the likelihood that no level of detail will be ideal or cope with all of the requirements, it is also clear that compilation of statistics at only national level is simply inadequate for discussion of sustainability. The tyranny of the national average will hide many different kinds of issues.

One possible starting point for discussion of these issues is to consider the advantages and disadvantages of using existing fine level administrative boundaries to delineate the sub-national areas required for the integration of data on sustainable tourism. While it may be necessary to consider mean by which these boundaries can be best related to the local interpretations of destinations, these boundaries should at a minimum facilitate a discussion between users and producers of information.

At this stage of the MST, the aim is to ensure that all relevant factors and perspectives are brought into consideration such that movement towards an agreed approach to the delineation of spatial areas can commence. In this spirit, it will be important that work being undertaken in different contexts and projects is made available. The remainder of the paper assumes that an agreed delineation of spatial areas representing destinations within a country has been determined.

3. Pathway #1: Data on tourism business and their characteristics

An essential aspect of understanding the sustainability of tourism is to understand the location of tourism activity. One way in which information on the location of tourism activity may be established is using the location of tourism businesses. From a statistical framework perspective, the most comprehensive approach to this is to record the location of establishments that are classified to tourism characteristic industries.

¹ These issues are discussed directly in Jones and Munday, 2007; and Munday et. al., 2013)

As outlined in Discussion paper #2, the collection of economic statistics should be based around a business register that lists all businesses within a country and stores a range of information about each business generally including its address and industry classification. It is proposed that using this information, each tourism business can be geo-coded to a specific location and hence a mapping of the location and density of tourism businesses can be completed.

Depending on the information about each business that is available on the register, it may also be possible to record information about the employment, size, ownership and legal structure of tourism businesses by location. Further, since the business register forms the statistical infrastructure for the collection of information through surveys and census, there is an opportunity to combine this collected data and attribute it to location as well. Since registers should also take on board changes in tourism businesses, e.g. new businesses and business closures, there is the potential to tell a quite sophisticated story about tourism industry dynamics in terms of location.

Although seemingly quite straightforward, however, there are measurement challenges associated with establishing and maintaining business registers, especially at the level of location, that will need to be considered. These include ensuring good and up to date coverage of businesses, keeping information about businesses on the register up to date, and dealing with businesses that have multiple establishments. Address information can also be challenging to use if the information provided is a contact address for the management of surveys rather than a business location as such.

While these are common issues, often there is no clear external demand for summarizing this information, and hence the work to establish and maintain business register can suffer from limited resourcing despite its importance within the whole statistical infrastructure. With regard to this, it is worth noting that the recognition of the relevance of locational information for informing sustainable tourism policy and analysis will be an additional step in providing a rationale for business register work.

Connecting tourism and the environment by means of an internationally agreed statistical framework may also open up new avenues to maintain and cross check information on business registers. For example, local tourism associations, key stakeholders to involve in MST, are likely to have a good understanding of the location of tourism businesses and this knowledge could be used to improve the quality of the information stored on the business register. As well, as discussed further below, water and electricity companies will commonly have information on the businesses that they bill. Such lists, which by definition must link to the location of water and electricity meters, might also serve as a useful input to the maintenance of business registers.

Since the information from a business register can be coded to fine spatial level, specific locations, it can be aggregated and summarized to provide information in relation to larger areas such as destinations or administrative regions.

4. Pathway #2: Data on tourism activity and visitor expenditure

Building on the information about tourism business characteristics described above, the next proposed pathway is collection of data on tourism business activity (turnover, value added, etc.) on the basis of locations. In effect this would represent an attribution of certain TSA aggregates into agreed tourism areas.

Where data are available at the establishment level this is likely a relatively straightforward extension of the business register information. Commonly however, two statistical challenges will get in the way. First, the collection of financial data usually focused on collection for a management unit which submits accounts for a business. Where there is only one establishment then the attribution to location is not problematic but where there is more than one establishment, for example a chain of hotels, attributing information to specific establishments is likely to require the collection of additional information – e.g. asking management units to estimate the share of revenue attributable to each establishment.

Second, it will usually be the case that economic statistics are collected using sample surveys of businesses rather than censuses. Consequently, if the sample size is not sufficiently large it may not provide information of sufficient quality for specific regions within the country. Ideally, the samples would be stratified to take the location aspects into account but this may not be possible depending on resources and costs.

Another challenge in releasing business data at finer spatial levels may be confidentiality concerns. Generally, official statistics will not release information at a level that allows users to identify the data pertaining to an individual business. This may be one factor to be considered in establishing the size of the tourism areas to be the focus of data integration.

While there may be some challenges in directly collecting data on tourism business activity at destination level, other techniques commonly applied in national accounting may be used. The starting point is that there are national level estimates of the particular variables, e.g., revenue, intermediate costs, etc. The best starting point would be the information contained in a national TSA. Using this starting point, the approach is to find appropriate indicators to allocate national data to sub-national tourism areas; the key issue is understanding the assumptions that are implicit in making any allocation.

For example, information may be available on the number of hotel nights in tourism areas and this may be used as an indicator to allocate information on hotel and restaurant expenditure. This assumes that the expenditure per visitor is the same across different areas. An alternative might be to use information from other sources, e.g. a hotels association, to give a distribution across tourism areas that is then calibrated to the relevant national total. In short, there are a number of methods by which a picture of tourism activity at sub-national and destination level may be established. Importantly, the methods can be refined and improved over time as resources permit. As a result there is generally no large barrier to making a first estimate based on existing knowledge, provided that compilers are open to different possibilities.

The information discussed to date in this section concerns data from tourism businesses. Moving from a production perspective to a consumption perspective, also relevant is information about visitor activity at the destination level. Two approaches may be considered in developing such estimates.

The first is to use supply side information, for example on total sales of restaurants in a destination, and then apply tourism ratios that account for the share of total sales due to visitors. A TSA will provide national level tourism industry ratios and as a first approximation these ratios might be applied.

But where possible it would be relevant to take into account variations across destination areas, which could be done following the second approach. In this case the information on visitor expenditure would be collected directly from the visitors themselves, using for example visitor surveys, and asking for a distribution of expenditure according to different tourism areas within a country. One factor to consider here is the alignment between the tourism areas included in the survey collection vehicle and the tourism areas delineated for analytical and policy purposes. Ideally the definition and naming of these areas would be the same.

Collection of data from a visitor perspective would seem the most direct option but there will be some tourism products for which allocation to specific destinations may be difficult. A particular challenge may concern transportation where a visitor travels between different tourism areas during the course of a visit. It will be important to develop means or conventions by which this activity is appropriately attributed to location, and at the same time considering the connection to the supply side information since the transport business may itself be located in different areas within a country. (It is noted that this issue is not unique to tourism measurement and has been confronted for both the development of balance of payments measurement and compilation of sub-national level national accounts.)

Another potentially useful source would be information from credit card companies which may be able to identify expenditures on tourism characteristic products by location of that expenditure. This type of “big data” might provide good information to help allocate national level information on total visitor expenditure data to tourism areas.

5. Pathway #3: Data on environmental flows

For the purposes of developing indicators of sustainable tourism, and building on the discussion of key environmental themes from Discussion paper #2, the next focus for destination level tourism information concerns environmental flows of water, energy, GHG emissions and solid waste. From the perspective of carrying capacity and environmental management, it is particularly important that these environmental flows are measured on a sub-national level since the environmental pressures associated with, for example, high levels of water use or high flows of solid waste, must be assessed in a local context.

Ideally, estimates of these environmental flows would be compiled at an establishment level (i.e. at the level of detail on the business register). For water use and electricity use, since most establishments will be connected to a network or grid, it is likely possible to develop estimates for tourism areas by working together with relevant authorities. For other energy flows – e.g. the use of fuel for transport - and flows of solid waste, it will likely be necessary to collect information directly from the tourism businesses themselves.

Particularly for energy flows, but also for water in some cases, it will be necessary to collect information on the use both of water and of energy by tourism businesses and also on the different potential sources of water and energy. For example, electricity use from a grid for some businesses may be quite low because they are instead using solar panels or diesel generators. Similarly for water in some destinations, the supply may be from desalination plants or individual bores. To understand the extent to which the use causes a pressure on the local resource these factors should be taken into account.

Increasingly, tourism businesses with a keen interest in sustainability are developing monitoring tools to assist individual establishments in recording their flows of water, energy, GHG emissions and solid waste². To the extent that these monitoring tools are collecting data that is broadly in line with the definitions applied at national level and that access to the data is possible, such corporate information may be integrated with other national level data to provide a more complete picture of location level environmental pressures.

Understanding local level environmental pressures may also require a good understanding of seasonal patterns. Annual average patterns of water use, for example, may hide significant differences that occur at different times of the year. Further, where peak periods of use coincide with times of reduced resource availability (e.g. high water use during summer) the issues may be further heightened. For this reason the compilation of data on sub-annual (monthly or quarterly) flows of water use and potentially energy use should be considered.

A final comment concerning energy and water is that location level information on these environmental flows cannot be directly interpreted as providing measures of sustainability. To make an assessment of sustainability it is necessary to consider (i) the availability of the relevant resource in the location; and (ii) other uses of the resource within the area. The first issue of understanding use in the context of the asset base is discussed in the next section. The second issue points to the need to consider economy wide measurement for environmental flows – using the SEEA framework is the best starting point for this measurement.

6. Pathway #4: Data on environmental assets and other infrastructure

Measuring the local asset base is fundamental to the assessment of sustainability and carrying capacity. In this section the organization of information on the local asset base is described with coverage of two broad asset types – environmental assets and tourism infrastructure.

For statistical and accounting purposes, environmental assets are described in the SEEA Central Framework. They encompass mineral and energy resources, land, soil, timber, aquatic resources (especially fish), other biological resources and water resources. For the measurement of sustainable tourism a sub-set of these assets are likely of primary and general interest.

Land

Initial priority should be the measurement of land. Land is a unique asset in the SEEA representing the space in which economic and other human activity takes place and in which other environmental, economic and social assets are located. The SEEA Central Framework describes two approaches to accounting for land: (i) accounting for the composition of land cover within a country and changes in this composition over time; and (ii) accounting for the composition of land use within a country and changes in this composition over time.

For sustainable tourism it is recommended that initial focus be placed on accounting for and mapping land cover – i.e. the extent of various types of vegetation and land cover including forest, wetlands, beaches and coastal areas, water bodies (rivers and lakes), urban areas, etc. Conceptually, accounting for land cover should be extended to include marine areas such as coral reefs. Establishing a land cover map for a country and how land cover is changing over time can provide excellent information to assess the changes in the landscape that may

² See for example, <http://tourismpartnership.org/water-stewardship/>

be attributable to human activity. For example, deforestation or increased urbanization. Since a land cover account is compiled for a country as a whole the various land cover types can be mapped and the boundaries of tourism areas overlaid using standard GIS methods. From this base, accounting for changes in land cover composition within a tourism area can be derived.

With a map of land cover in place, a logical next step is to identify what might be regarded as “key tourism features” in the landscape. This may include natural features (such as beaches, national parks, viewing locations, etc.); cultural, indigenous and historical sites; and relevant produced assets such as hotels and resorts, theme parks, roads, transport hubs, waste treatment facilities, etc. The location of all of these features is relevant to understanding the sustainability of tourism within a local area.

The measurement challenge here is not the lack of knowledge of the location of such features but rather applying the resources needed to bring the relevant data together to provide (and maintain) an integrated picture of land cover.

Water resources

The second environmental asset of particular interest at destination level is water. The SEEA Central Framework provides a detailed water resource asset account to record the stock and changes in stock of water resources (due to abstraction, precipitation, evaporation and movements to other water bodies) over accounting periods. It recommends that these accounts be compiled at the level of water catchments since the availability of water can vary considerably between water catchments within a country. The measurement of sustainable tourism should support the development of water accounts at this level of detail with a focus on those catchments that support tourism areas.

Because water resources asset accounts provide a statement on the complete balance of inflows and outflows, analysis is possible of the sustainability of current water use levels by tourism and other industries within a catchment. Depending on the water catchment, it may be important to develop accounts at a sub-annual frequency to take into account both changes in the pattern of water use (e.g. through tourism peaks) and changes in the pattern of water availability.

In general, countries will have information on many aspects related to changes in the water balance through direct measurement and hydrological modeling. The statistical challenge here is collating this information for the purpose of conveying a consistent time series of information on water resources.

Biological resources

The final group of environmental assets considered relevant in a tourism context are selected biological resources. Since tourism activity does not depend on the extraction of natural resources, accounting for biological resources has a different motivation in the context of tourism and will be quite situation specific. Following the accounting frameworks of the SEEA Central Framework, it may be relevant to compile accounts for fish stock, animals that are the focus of recreational hunting (deer, boar), and also wildlife that attracts visitation to national parks and protected areas. In these contexts, accounting information can help to organize information on trends in the numbers of animals which in turn could support an understanding of whether the related tourism activity is at risk.

The related issue is the condition and changing condition of ecosystem assets. The measurement of ecosystems is considered in the following section.

Tourism infrastructure

In addition to environmental assets that support tourism activity, it is also relevant to bring together information on tourism infrastructure, i.e. produced assets that support the production of tourism products. The aim in compiling this information is to provide a sense of whether there is sufficient capacity in tourism infrastructure to support current levels of visitation and whether the condition of the infrastructure points to the need for improvements and additional investment.

Since infrastructure is, by definition, located in a specific place, attribution of the information to tourism areas should be relatively straightforward. The type of infrastructure that may be of interest include

- Transport (roads, airport capacity, port capacity, number of taxis, etc.)
- Accommodation (number of hotels, rooms/beds, occupancy rates)
- Utilities (communication services, water and electricity supply, waste treatment)

In the TSA:RMF, Table 8 records information on the levels of gross fixed capital formation (GFCF) or investment by different tourism characteristic industries. The proposal here is to complement this information with data in physical units on the associated capital stock of tourism produced assets and measures of capital use and availability. Presenting this information in terms of location of infrastructure is an important aspect in informing a discussion on sustainable tourism.

7. Pathway #5: Accounting for ecosystems

The measurement of environmental assets described in the previous section focused on accounting for individual resources – i.e. each environmental asset is considered distinct or separable from the other assets. In the past five years a body of accounting has emerged to consider how different environmental assets interact as part of ecosystems. Ecosystem accounting, as described in the SEEA Experimental Ecosystem Accounting (SEEA EEA) provides a framework for recording the extent and condition of ecosystem assets and also the supply of ecosystem services that are used by economic units.

By integrating measures of both assets and services, ecosystem accounting ensures that both sides of the sustainability discussion can be considered in tandem – i.e. whether the environment is being degraded on the one hand and the nature of the use of the environment on the other. Importantly, for tourism purposes, the scope of ecosystem services is broad and explicitly incorporates the provision of recreational services. For example, the services provided by forests for hiking, reefs for diving and lakes for fishing.

A key feature of ecosystem accounting is that it uses a spatial approach when developing estimates. That is, it starts from the recognition of different ecosystem types in the landscape – e.g. forests, wetlands, beaches, etc. – and builds up to provide a complete picture across a country of the extent (area) and condition of these ecosystem types and the different baskets of ecosystem services supplied by each ecosystem asset. Thus, the approach is directly amenable to the development of sustainable tourism measures at destination level.

Measures of ecosystem extent and condition will likely build upon information from a land cover account as described in the previous section although it is likely to be useful to apply more detailed classifications of ecosystem types – e.g. types of forest. The most important measurement however, will relate to information on the location and composition of different ecosystem assets within the landscape, particularly in terms of the links to tourism activity. That is, ecosystem accounting supports the analysis of the location of tourism activity relative to different types of ecosystems. For example, by understanding the composition of the local landscape, most sensibly at the level of a single destination or agree spatial area, in terms of forests, mangroves, beaches, dunes, built areas and so on, supports understanding of the connection between tourism activity and the different ecosystem types.

The ecosystem condition account provides a framework to record information on changes in the quality of key tourism features, such as beaches, reefs and national parks, by recording metrics related to the condition and quality of the specific feature. Examples include measures of water quality near beaches, coral cover in reefs and age and density of forest trees.

Flows of ecosystem services are recorded in supply and use accounts. For a given tourist area there will likely be a range of ecosystem asset types and also a mix of different ecosystem services. Ideally, to allow analysis of trade-offs and impacts, all ecosystem assets and all ecosystem services would be recorded for the area – however initial measurement may focus only on specific asset types and specific services. Ultimately the goal of ecosystem accounting is to provide a broader picture of the connection between economic activity and the environment by recording all of the various connections and covering services about the provision of food, fuel and fibre, benefits from the regulation of the environment (e.g. clean air, clean water, flood protection, etc.) and cultural and recreational benefits.

At this stage, work is still progressing towards standardized and comprehensive advice on the compilation of ecosystem accounts. However, measurement is advancing rapidly across a number of different fields of endeavor including specific applications with respect to tourism in recent studies in Peru (Conservation International, 2016) and the Great Barrier Reef (ABS, 2016). It is to be anticipated that much more information will be available within the next 5 years. In combination with the other destination level data described in this discussion paper, ecosystem accounting data will provide the most comprehensive picture of environmental sustainability for tourism areas.

8. Conclusions

The central theme of this discussion paper is that the measurement of sustainable tourism requires a spatial dimension. Thus it is necessary for the statistical framework to articulate ways in which the spatial characteristics of tourism can be best taken into account. Central to this challenge will be the delineation of distinct, local level areas that are relevant for policy and appropriate for measurement. There are undoubtedly a range of conceptual and practical issues to be resolved but there are options for taking this discussion forward.

Assuming approaches to delineation of spatial areas can be determined, this paper has described five potential measurement pathways to support the organization of information on sustainable tourism. Some of the data may be able to be identified and collated relatively quickly, in other cases additional research and data collection will be required. In all cases, it will be relevant to build as far as possible on available data and existing statistical infrastructure, such as business registers, and to progressively improve the available set of information.