

## Assessing the Impact of Tourism in Regions: Towards a Holistic Analysis?

Calvin Jones<sup>1</sup>

[Jonesc24@cf.ac.uk](mailto:Jonesc24@cf.ac.uk)

+44 (0) 2920 5470

### Abstract:

Whilst tourism has long been an area of policy interest at sub-national scale, statistical and analytical techniques have often been fragmented and partial, meaning that tourism authorities have not been able to demonstrate the economic contribution and wider impacts of the activity. The extension of the tourism satellite account (TSA) to the regional scale provides the first opportunity for regional agents to undertake consistent and defensible analyses based upon high quality data. Furthermore, the TSA offers an opportunity to extend analysis beyond the economic, and into the social and environmental realms. However, limitations in the TSA structure must be resolved before truly policy useful analysis can become the rule rather than the exception.

---

<sup>1</sup> Cardiff Business School, Colum Drive, Cardiff, UK CF10 3EU

## **1. Introduction**

Tourism has for decades wrestled with a difficult problem. Despite many agencies at both national and sub-national scale accepting the economic and societal importance of tourism activity, tourism has often been poorly understood within its economic, social, or environmental contexts, meaning that the ‘impacts’ of tourism cannot be properly assessed (Beynon, Jones and Munday, 2009). In large part, this problem arises from a very obvious truth about the nature of tourism: it is not an industry, but a subset of final demand that is only distinguished by the character of the purchaser at the time of purchase, rather than by any intrinsic characteristic of the goods or services purchased, or of the supplier of those goods or services. Thus, a newspaper purchased by a ‘visitor’ at a newsstand at 9.01 on a Thursday morning is rightly part of the ‘tourism economy’, whilst the same newspaper purchased at the same newsstand by a local resident at 9.02 is not. These measurement problems are compounded by the fact that tourism activity is diffuse, and uneven over both time and space within nations and regions. To this fundamental difficulty we must add the more mundane (but important) issue of a public policy approach which has, in many countries, been characterised by a confused and changeable attitude to concept and classifications, and by under resourced and fragmented data collection (DCMS, 2004). For example, in the UK historically, the central statistical agency has only been responsible for the collection of statistics on international arrivals, whilst a variety of tourism and regional development agencies have collaborated on the collection of data on domestic tourism, and a different set of agencies on the collection of excursionist data (NWDA, 2005).

These basic statistical issues have not hindered the development of a number of modelling approaches that have sought to quantify the economic impact of tourism at national or regional scale, usually based upon the Leontief manipulation of a set of input-output accounts, either explicitly and straightforwardly, or implicitly and with modifications, as in the case of CGE approaches (Dwyer and Forsyth, 1997; Fletcher 1989). Unfortunately, these approaches have drawn criticism for almost as long as they have been in use due to the already noted problems with the underlying statistical base, or due to inappropriate or misleading analysis (Archer, 1984).

These longstanding and deep issues have meant that tourism economic analysis has enjoyed limited wider credibility and acceptance, for example by economic policymakers or, in an increasingly critical media. The first Tourism Satellite Account conference in Ottawa in 1991 was the recognition by the World Tourism Organisation and its Canadian partners of the severe implications of this sub-optimal situation. The Tourism Satellite Account project that has gained pace since then, initially for nations but now extending to regions, is seen as its partial remedy.

## **2. Tourism Satellite Accounts for Regions**

The Tourism Satellite Account (TSA) is defined and developed as a refinement of a system of national accounts (effectively input-output in form) which reveals the scale and nature of tourism economic activity that has formerly been hidden in wider sectoral

or activity definitions (UNSD *et al*, 2008). As such, and quite properly, its initial area of application has been the country (legal state), with these units both having an appropriate statistical base and being the primary constituency of the UNWTO, the prime TSA mover. More latterly, however, there has been recognition by both national and regional agencies that tourism, being an inherently geographically uneven activity, requires analysis at a lower geographic level – and that the satellite accounting approach is in some cases a suitable methodology. Again, Canada was in the vanguard, with a relatively well developed input-output structure for its provinces allowing the development of regional TSAs, albeit with a large measure of national data used to inform estimation, and producing a ‘reduced’ set of TSA tables and headline variables compared to the national TSA (Barber-Dueck and Kotsovovs, 2002). A number of other nations and regions have since set about developing regional TSA approaches. These fall into two basic categories. In the first, a national TSA is regionalised using an allocation process that apportions national estimates of key TSA indicators (such as tourism gross value added or tourism dependent employment) according to the regional shares of related activity, be this tourism volumes or spending. Countries including Denmark and Norway have used this approach (see Zhang, J for background). This ‘top down’ regional TSA (RTSA) brings the benefits of consistency across regions and with the national TSA, but usually produces only a very limited set of TSA indicators. Further, where production functions or tourism demand is heterogeneous across a set of regions, at top-down RTSA may inadequately represent these regional differences, calling into question its appropriateness for providing evidence with which to develop regional tourism policy.

The alternative to this top-down approach is to develop a fully specified tourism satellite account that is based on a fully-featured set of regional accounts, these usually being input-output in structure. This approach has the clear benefit of providing a full range of TSA data, including estimates of regional commodity production that is consumed by tourists (the ‘tourism product ratio’), and the extent to which regional industries and their employees are dependent upon the demand of tourists (the tourism industry ratio; tourism-dependent employment; See UNSD *et al*, 2008). The results of this ‘bottom up’ TSA process will produce estimates that are bespoke to the region in question, reflecting the nature of regional tourism supply and demand: as such, a strong argument can be made that such approaches are more useful for policy development. However, their very nature means they are data-hungry, time consuming to construct, and result in TSAs that are not necessarily inter-regionally or regionally-nationally comparable. For these reasons, only Andalusia in Spain and Wales in the UK have so far developed fully specified ‘bottom up’ TSAs, but with other regions expected to follow suit (Jones *et al* 2009). The UNWTO has recognised the need for a more consistent analysis of the tourism economy at sub-national scale, and the latest edition of the *International Recommendations on Tourism Statistics* includes reference to the need to further develop sub-national methods: a UNWTO sponsored group INREMT will develop an international network and evidence base on wider sub-national analytical approaches, including those on economic impact (see <http://www.iafet.com> for more detail on these developments).

### **3. Extensions to the RTSA: responding to policy needs**

Whilst national TSA developments have been led by national statistical agencies with the collaboration of national tourism agencies, at regional scale the situation has been somewhat different. Here, the use of TSA approaches have been championed rather more by regional tourism agencies convinced of their potential use in policy development, with statistical agencies taking a far lesser role (NWDA, 2005). The lower profile of statistical agencies at the regional level (both in tourism and in governmental structures more generally) has perhaps contributed to the fact that analytical developments in regional TSAs have in some cases developed ahead of national TSAs. This is true of Andalucia, where the RTSA is being investigated as a complementary approach to inform the sustainable management of very tourism intense destinations; and in Australia where state-level TSAs are being combined with Computable General Equilibrium approaches to provide state governments with sophisticated *ex ante* assessments of the likely impact of tourism interventions (see Ho *et al* 2008). The following sections relate the case of Wales, in the UK where the RTSA has been extended into an environmental account and economic and environmental impact analysis tool.

### **3.1 Tourism Environmental Satellite Accounts (TESA) for Wales**

Input-Output analysis using physical units has a long history. More recently, monetary national accounts have been extended to include a quantification of the physical consequences of economic activity, with these tables either included within a set of environmental accounts, or labelled *environmental satellite accounts* or *national accounts matrix extended with environmental accounts* (Leontief, 1970, Keuning *et al*,

1999). The development of tourism satellite accounts (with a national account in input-output as the 'planet') has meant it is technically very straightforward to estimate the environmental consequences of tourists' spending. However, due to the relatively recent development of TSA, and perhaps a divergence in responsibility or interest between environmental and tourism statisticians, such developments have been very rare (with the exception of a thorough environmental lifecycle analysis undertaken of New Zealand's tourism, which had such a satellite-type approach as a constituent part; Patterson and McDonald 2004). This approach has been adopted in Wales to estimate the carbon emissions and post-industrial waste arising as a consequence of tourists' purchases whilst in the region (see Jones and Munday, 2007 for full detail). Firstly, the RTSA provides an estimate of the proportion of each of 26 regional industries' output that is tourism dependent. This ratio is then applied to the total regional carbon and waste arisings of that industry (with these latter estimates of carbon and waste tonnes per unit of economic output taken from established regional environmental satellite accounts). Here, an estimate is achieved of the emissions associated directly with regional production that services the tourism economy. A second step involves the conversion of TSA Table 6 (a reconciliation of supply and demand in a commodity-by-industry structure) into a symmetrical industry-by-industry transactions matrix that is susceptible to multiplier analysis. Then tourism consumption demand is treated as a regional economic shock, utilising Leontief-inverse analysis to establish the supply chain and wage-related impact of tourism in terms of regional production (although with all the limitations and assumptions such analysis brings; Miller and Blair, 1985). The resulting estimate of the direct, indirect and induced environmental impacts of tourists' spending (presented in Table 1) is of considerable policy interest. Because the

TSA collates information about the spending of different types of visitors (albeit not in an immediately useful form; see Section 4 following), the differential environmental impacts (established through their impact on regional economic supply) can be estimated, in aggregate, per trip and, critically, per unit of economic value added. This last ratio can provide a measure of the ‘environmental efficiency’ of different types of tourism.

### **3.2 The TSA and Economic Impact Analysis**

The derivation of the symmetrical transactions matrix detailed above has of course potential benefits for economic, as well as environmental policy. This has been evident in Wales, a region which has enjoyed much success in attracting a number of ‘mega’ sporting events of world importance, including the Rugby World Cup 1999, the 2010 golf Ryder Cup and the English Soccer FA Cup (Jones, 2005). The revealing of the visitor economy within an established regional accounting framework can help policymakers understand the economic importance of such events in a way which enables comparison between major events; between sporting events and other elements of the visitor economy – and indeed enabling comparison with more traditional economic activity. The sectoral disaggregation inherent in the TSA, combined with the standardisation of event visitors’ spending within a TSA conceptual structure means that a more defensible and accurate estimate of economic impact can be made. The method was used to establish the impact of the Welsh Millennium Stadium in Cardiff between its inception in 1999 and 2006, a period during which it hosted a number of world-scale events, and was amongst the top attractions in the UK, with over 1.2 million visits per annum. In attracting over half of its spending from outside the region and with

many spectators having very high levels of regional spending per trip, the stadium might be considered a ‘best possible case’ of such developments in terms of economic or developmental impact. The analysis of stadium visitors’ spending during this time revealed a contribution to regional value added (directly and indirectly) of around £50m per annum (Jones *et al* 2006). This is a substantial figure in isolation: yet a comparison with wider regional economic aggregates within the TSA and input-output structure reveals that stadium operations, including all spectator spending accounted for around 0.125% of regional value added –and indeed less than 1% of city value added, despite Cardiff being a relatively small conurbation of 300,000. These estimates may have implications for politicians who wish to base regional development or growth at least in part on the attraction of large sporting events.

Meanwhile the analysis of another sporting event, the Wales Rally GB (a motorsport event held annually in Wales, part of the FIA World Rally Championship) reveals how the TSA and TESA can help develop a more rounded and holistic analysis of impact. Here, the economic value added associated with the impact is calculated using a Leontief multiplier approach. Simultaneously (and using the same visitor and organisers’ spending data), an estimate of the carbon equivalent emissions associated with the event is also made (with an allocation also for direct fuel impacts of spectators and participants) (Table 2). After this process, an estimate can be made of the tonnage of carbon-equivalent emissions per unit of economic value added associated with the event. This ratio can be compared with the ‘carbon efficiency’ of other regional economic activity in terms of value added, to assess whether the promotion of event activity is environmentally and developmentally appropriate (Jones, 2008).

### 3.3 Developments in Wales: Lessons learned?

The use of RTSA structures to enable ‘evidence based policy’ has probably developed furthest in Wales – certainly as far as bottom-up, fully featured RTSAs are concerned. A number of analytical and structural issues have arisen which might have implications for other regions wishing to develop TSA-type approaches. Firstly, there remain the difficult problems associated with input-output modelling in general: the well known limitations are not eased by the incorporation of TSA data or structures, and concerns still remain about how accurately Leontief-inverse results actually represent the reality of indirect impacts, particularly in small, supply constrained regions. This is of special concern when considering environmental impacts: unlike in the case of employment or economic value added, the bulk of carbon emissions associated with visitor activity in a region are *indirect* (e.g. occur in power generation or fuel refining sectors which supply tourism-facing businesses). This both reinforces the need for a multiplier analysis, but also requires that the analysis accurately reflect the behaviour of regional supply following a shock. It may be that future developments in areas where more sophisticated modelling techniques are commonplace (such as Australia) may in part address these limitations. Another limitation relates to the industrial structure of the RTSA and regional NAMEA or environmental account. Typically, TSAs focus upon the disaggregation of tourist-facing service sectors, whilst NAMEAs report on far broader aggregations of service sector activity. This means that currently, much of the effort spent in developing TSAs is underused in the TESA, with, for example, the carbon emissions associated with production in the accommodation sector assumed to be

comparable with those in the restaurant sector due to data and structural limitations in the NAMEA.

Work undertaken in Wales and in the regions of the UK more generally has revealed a number of barriers which limit RTSA developments even where there is a will and need to develop such structures in regions (NWDA, 2005). Moreover, the work discussed above has revealed significant limitations of the TSA as currently structured when used as a basis for modelling. Potential barriers to RTSA development are discussed in the following section, whilst the limitations of the RTSA in modelling applications is further discussed in Section 5.

#### **4. Barriers to the regional TSA approach**

Frechtling (2008) has shown in clear detail the appropriate steps for regions wishing to progress along the TSA path, and provided different options for situations where there is either a single region at issue, or where there is an exhaustive set of regions seeking to benefit from a regional-allocation approach. These options are apt and fitting programmes where the institutional will can be identified to establish the statistical and capacity building programmes that lead to the TSA. There may be, however, regions where tourism is (*a priori*) considered economically important, is of policy interest, and hence where TSA outputs are desirable, yet where the development of a TSA project might not occur. Evidence suggests there might be both institutional and (linked) statistical barriers to such a development

#### 4.1 Institutional Barriers

Frechtling (2008) identifies the early involvement of the National Statistical Institute (NSI) in the RTSA project as of key importance: however, this raises the prospect of a RTSA project falling at the first hurdle. If the NSI can identify no resources to engage with the regional TSA project at an early stage, regional stakeholders (or potentially a even national tourism agency wishing to develop an RTSA framework across a nation) may be forced either to abandon the TSA project *in toto*, or at least in the short term as they continue to pressure the NSI in numerous ways to become engaged. The non-involvement of the NSI is a deeply significant issue for RTSA development; yet in a number of cases this adverse outcome may not only be possible, but likely. The very need for sub-national TSAs derives in part from the differential importance of tourism across the national space; peripheral regions that are tourism intensive, but in countries where tourism is considered not economically significant, may find it difficult to lever the appropriate resource and involvement from central agencies (Jones *et al* 2009; DCMS, 2004). Other, external pressures may also count against RTSA development. For example, within the EU, the tourism-statistical efforts of member states are driven by a EUROSTAT directive that does not (at time of writing) require TSA development at either national or sub-national, level. Meanwhile, national border surveys must respond to the needs of providing information for balance of payments purposes and, increasingly often, on flows of migrants, either of which may take precedence over tourism-specific information collection. Regional agencies will only in special circumstances have the resource and statistical capacity to supplant the NSI as the driver of R-TSA development – Andalusia being the particular exception. Even in this case,

there may be a requirement to commission regionally specific demand and supply surveys where national structures are inadequate at regional level: this is a significant task indeed.

#### **4.2 Statistical Barriers**

The problems associated with TSA development at sub-national scale are challenging solely due to the the purely statistical impact of smaller sample sizes, and non-regionally stratified samples that can significantly impact upon reliability and accuracy (NWDA, 2005). However, there is a more generalised issue related to the lack of a unifying and unified statistical framework at regional scale to replicate the System of National Accounts (SNA). A number of countries are blessed with a well-developed system of regional accounts, often in Input-Output form, that continue been well used in sub-national TSA development, for example in Canada (Barber-Dueck and Kotsovo, 2002). However even in these ‘best-case’ scenarios, there remains significant work to do in amending the accounting framework to properly replicate national TSA structures, and it is illustrative that the most developed projects in this regard have involved the enthusiastic and continued support of the NSI. This is by no means guaranteed in all nations or regions.

#### **4.3 Conceptual Barriers**

The latest edition of the TSA methodological framework recognises these issues and adds more, suggesting that due to the lack of a robust and universal sub-regional accounting framework (except in most basic form in ESA95) means that a number of national accounting concepts are very difficult to apply to regions (UNSD, 2008: p101). For example potentially multi-regional activities (both on the demand and supply side) such as trips, businesses and travel packages mean significant thinking and analytical time must be given over to the development of any TSA-like structure for a region. There is, however a more fundamental conceptual issue that must be addressed prior to considering the most appropriate way of measuring tourism's economic significance for regions. That is the nature of the 'planet' around which our tourism 'satellite' revolves, and the implications of this for the RTSA statistical structure. The heart of a TSA or RTSA is Table 6: the reconciliation of supply and demand within a detailed 'tourism make matrix' that is in commodity-by-industry form. The derivation of this tourism supply table is made extremely difficult at national let alone regional scale by the need to estimate the relative supply of tourism commodities from different industries on a very disaggregated scale; often far more disaggregated than those that exist in the Supply and Use Tables of the relevant SNA or regional account (if any even exist; Frechtling, 2008). It is worth noting, however, that the burdensome requirement to produce the full tourism commodity by industry 'make' matrix is only strictly necessary to replicate national accounting structures and tables that reveal product supply by industries. However, such a disaggregation is not *strictly* necessary to produce estimates of the 'headline indicators' that are of interest (such as Tourism Value Added or tourism dependent employment) if tourism *demand* can be presented as the demand for the outputs of specified tourism-characteristic and connected industries:

i.e. the table is calibrated (or disaggregated from existing input-output structures) in an industry by industry rather than commodity by industry fashion (see Jones and Munday, 2008 for more detail here).

These institutional, statistical and conceptual barriers may preclude the development of a 'full' RTSA. However, whilst an RTSA may be an appropriate goal for some regions, the following section suggests a number of reasons why regions wishing to better understand the economic impact of tourism, but which are less concerned with international acceptability or comparison, might wish to reconsider their options.

### **5 Limitations of the TSA Structure in Policy**

The above discussion hints at issue not often discussed in TSA development: that they are ill suited to use in modelling and policy applications such as those discussed in Section 3. Whilst the TSA and RTSA bring the conceptual satisfaction of adherence to SNA and a set of recognised international standards, they do not bring what many regional policymakers want and expect: multiplier and impact analyses. To undertake such work, the TSA must be 're-engineered' into an industry-by-industry transactions table amenable to Leontief inversion. Moreover, there are other structural issues which limit the application of the RTSA to policy problems.

Firstly TSA Table 6 reports the demand side of the tourism market as tourism internal consumption. The aggregation of different types of tourist demand occurs *before* the reconciliation with supply. This has several important implications. Firstly, we do not

know what proportion of tourism value added (TVA) is dependent on different types of consumption – e.g. from international arrivals, domestic tourists, day visitors or other consumption. This means that whilst the TSA tells us which segments are most important in terms of consumption, it cannot do the same for value added, as the ratio between consumption and TVA will be different for different market segments driven by the differential spend on commodities (for example, a far lower proportion of day visitors' consumption is likely to be translated into TVA for smaller regions: Jones *et al* 2003). The RTSA then cannot show a tourism agency which are the 'highest value' visitors, either per trip or overall: this is, however, likely to be a central policy consideration for the tourism agency seeking guidance on how to allocate scarce resources – for example, in targeting different market segments.

Secondly, there is a limitation in the extent to which TSAs concentrate on developing a tourism 'make' matrix. The top-left quadrant of TSA Table 6 is a very detailed exposition of which industries make which tourism products. However, if we are to move beyond the TSA to consider *indirect* effects, what becomes as important is the inputs that tourism-characteristic industries use to create these final products. Tourism-characteristic industries do not, in general, trade with each other at all (Jones *et al.*, 2003). This means that even the first round of input purchases usually takes us outside the realm of tourism-related products and industries and into the wider economy (for example with purchases of food, business services etc.). The 'industry use matrix' in the TSA (the bottom left of TSA Table 6) is however aggregated into broad categories (perhaps ten supplying industries, plus other inputs such as labour income and taxes). This use matrix is crucial in the derivation of Tourism Value Added but is only of

limited use for the modeller wishing to examine indirect effects, as the second and third round of purchases are made by non-tourism businesses, but these are only reported in very aggregated form (Smeral, 2006). Unless a full set of timely ‘analytical’ Input-Output tables is available in the system of national accounts (detailing, for example an industry by industry use matrix, or imports of specific products by discrete industries) the modelling of these indirect impacts can be problematic. For example, the latest analytical tables available for the UK refer to base year 1995 and the underlying make matrix appears even older (DCMS, 2004).

Thirdly, and despite its policy importance, estimates of tourism dependent employment are given only limited attention in the TSA and hence RTSA structure: at regional level, this is especially problematic (Jones and Munday, 2008). It is rare that employment is explicitly estimated within any SNA, and hence, it appears in the TSA as an additional ‘module’. The TSA *Recommended Methodological Framework* does not suggest that ‘tourism-dependent’ employment be estimated using TSA Table 7; it is conceived as a simple count of employment in tourism industries, flexible according to situation (UNSD *et al*, 2008). Other publications (e.g. from EUROSTAT, 2003) have suggested that tourism-dependent employment be estimated by applying tourism industry ratios to industry employment. Given the potential importance of tourism for welfare and employment outcomes, the lack of clarity in TSA Table 7 is a limitation (albeit an understandable one given the link of the TSA structure to the SNA).

The above issues limit the effectiveness of the TSA as a ‘ready made’ tool for inclusion within modelling approaches. However, it must also be remembered that the TSA was

never intended as such, and this itself has additional implications. The central need of the TSA to embody the best available data and methods in the search for credibility is extremely worthy but does impose costs, both financial and in the time taken to develop and publish the matrices. National accounts, indeed national statistics generally, are usually slow to be published; tourism is only rarely a central statistical concern (hence the very need for the TSA), and thus the TSA will generally appear a number of years following its reference year (DCMS, 2004, but see US Travel and Tourism Satellite Accounts which currently are produced with very small time-lags, Kuhback & Herauf, 2005). More generally, there is a very clear desire on the part of the WTO to establish the TSA as the central tool in tourism economic accounting, thus needing to obtain the agreement of all its partners, including OECD; EUROSTAT; the International Labour Organisation; and its own member states. Extensions and adaptations to the TSA will then necessarily be slow and initially limited, and the TSA will (quite rightly) never extend beyond an accounting tool to incorporate modelling.

The suggestion here is that in some circumstances, the focus on the *satellite* element of the account is, at regional scale, overly limiting: an ideal scenario that should not impede the development of a better understanding of tourism's economic significance where its strictures cannot be fulfilled. Instead, the development of a fully industry-based appreciation of tourism activity might provide a quality of information that is adequate for regional policy needs – and far superior to the third party, largely modelled information that is often the current *status quo*. Such a statistical system might recycle a term that has fallen into disrepair, and be labelled a *Regional Tourism Economic Account* (RTEA) to distinguish it from TSA-based approaches

## 6 Tourism Economic Accounts: A Partial Solution?

At heart, RTEA is another option for fully reconciling tourism economic demand and tourism supply across different activities, albeit on an industry-by-industry rather than commodity-by-industry basis. Freed from national statistical structures (but *not* concepts) the account can afford to be better structured towards immediate policy application. An example of a potential RTEA structure is presented in Table 3. The RTEA remains itself an account and not a model; only estimating the direct impacts of tourism but both retaining both its transparency and avoiding adherence to any particular method of estimating indirect impacts (with all the assumptions and limitations these imply). The RTEA adheres closely to the concepts and classifications discussed in the TSA:RMF (UNSD *et al*, 2008), differing only in the structure of its tables and hence the derivation of some key variables such as tourism value added where the estimate given by a TEA would not be identical to that estimated by a TSA using the same data (Jones and Munday, 2008). Critically, the RTEA should be consistent with whatever regional accounting information exists, minimising the use of modelled or imputed data. The focus of analysis and construction is not on the supply side (which is largely drawn from regional accounts perhaps further industrial disaggregation, and with no commodity-by-industry matrix required<sup>2</sup>) but on the demand side. Here, tourism consumption is presented very differently from the TSA; by distinct tourist type; by industry not commodity; and, critically, *net* of regional imports

---

<sup>2</sup> It should be noted that this central TEA table provides a link into estimation of tourism dependent employment (applying the tourism industry ratio on value added to employment) as is currently generally accepted for TSA; EUROSTAT, 2003.

– meaning reconciliation with the regional supply side is mostly a matter of matching prices.

The RTSA does imply perhaps some additional work to ensure demand-side tourism data is in an appropriate format. For example, Tourist surveys will often collect information on commodities that are purchased but not on which industry supplies that commodity – for example not specifying whether a serviced meal was taken at a restaurant, hotel or a tourist attraction. Reallocation of commodity to industry is thus necessary on the demand side. This may be informed by specific questioning of tourists regarding the location of their activities, with online and diary methods increasingly in vogue which supplement more traditional estimates of visitor volumes with a wealth of detail on activities undertaken. There is also a potentially tricky issue with reporting expenditure net of regional Imports – This is however one affecting only a limited set of tourism characteristic and connected industries. By their very definition, services consumed by tourists within a region (such as serviced meals and accommodation) cannot be imported, and the direct value added concerned with such provision accrues regionally. Problematic areas include the purchase of inter-regional transport and packages (which are equally a problem when viewed as TSA products).

A problem is also encountered when treating retail and distribution activities as a distinct industry (unlike in the TSA). This raises the problem of purchases of goods bought by retail establishments with no further processing – including, importantly for many regions, fuel for private cars. Clearly, the value of these goods must be transferred from the retail industry (with which tourists will declare they have spent monies) to the

manufacturing industry that provided the finished product. In some cases, these manufacturers may be a separately identified regional tourism-connected industry; a regional industry that is non-tourist connected, or the goods may be directly imported to the region by the retailer/wholesaler. This may be the most difficult element of RTEA estimation, as tourists will typically be unaware of the origin of the goods they buy, and there may be little light shed by established business surveys on inter-regional imports and exports.

The above suggests that a measure of work must be done with demand-side structures to develop a RTEA. One might then hypothesise that TEA development might be suited to regions where there is devolution of autonomy over tourism data and associated surveys, but where regions may have less control over the business-side data and surveys that are typically the remit of central statistical agencies (the NSI). The development of an RTEA will of course have benefits and costs compared with embarking on a full RTSA development, or indeed doing nothing in this area. On the positive side, an RTEA project might help integrate statistical ‘good practice’ in a region. Despite its separation from the TSA, an R-TEA would still require adoption of the International Recommendation of Tourism Statistics and the generalised TSA:RMF approach, which would develop understanding of the nature of tourism economic structures and emphasise the importance of transparent accounting as opposed to proprietary modelling. Additionally constructing an RTEA would have synergies which would ease the potential later development of an RTSA. Apart from the clear benefit of requiring improved quality tourism statistics the TEA highlights the benefits of developed regional (input-output accounts), and may be a way to engage with the

national NSI on a more 'tentative' and hence easier footing than requiring its full membership of a regional TSA inter-institutional framework.

Another benefit of an RTEA is that its *industry*-based structure makes it immediately more familiar to policymakers far more used to thinking in such terms than in 'commodity/product' terms. Meanwhile, the separate analysis of tourism demand by type of visitor means the TEA fits with regional policy requirements such as assessing the highest value adding visitors (per trip or as a ratio to gross expenditure), the value of 'tourism regional export earnings' etc.

It is not, of course a one-way street, and a TEA approach to the regional tourism economy carries with it a number of costs and compromises – at regional, national and even international level; for example The 'satellite' element of the TSA is meant to establish comparability and consistency of tourism accounts as far as possible.

Abandoning the notion of a satellite means that any developed TEA is unlikely to be quite as comparable as an RTSA that is UNWTO compliant (such as in Andalusia) at either inter-regional; regional-national; or international scale<sup>3</sup>. Additionally, this paper has already shown that this alternative approach requires a fuller understanding of the 'tourism demand side', and indeed a greater level of detail than that required by RTSA.

There is perhaps a more diffuse and yet more central concern allied to developing the RTEA approach, and that is one that may be felt internationally. UNWTO and its partners have, for many years persevered with message that the TSA is the most

---

<sup>3</sup> Nonetheless comparability of approach, classifications and concept can and should remain.

appropriate measurement tool for tourism's economic contribution at national, and now sub-national scale. The presentation of a new (or rather rediscovered) concept risks adding complexity and confusion to that hitherto simple message. Careful consideration would thus need to be given to how the RTEA was presented: indeed there may be less justification for close UNWTO involvement in any RTEA developments, with the concept having no application for UNWTOs core members – who are after all largely member states. Indeed, a collaboration of regions as evidenced by the IAFET conference in Malaga in 2008 might provide a suitable network within which to discuss and develop RTEA (see [www.iafet.com](http://www.iafet.com) for further information and developments regarding a network of regions interested in developing statistical approaches to tourism in regions).

## **7 Conclusions: Tourism Economic Analysis in Regions**

The development of the tourism satellite account, and its subsequent extension to sub-national scales, has provided an important impetus for agencies, academics and others who wish to develop appropriate measurement tools that reveal tourism's impact on regional economies, and hence help develop a truly evidence-based policy. This paper has shown that, despite some conceptual limitations (and indeed statistical limitations), a TSA project can contribute significantly to such policy development. In Wales in the UK, for example, TSA structures and data have been used to help examine the indirect and induced impacts of tourism; to establish the relative economic importance of different tourist segments; and to critically evaluate the region's emphasis on a development policy which emphasises the importance of large-scale sporting events.

Perhaps most importantly and critical for future analysis, the TSA can form the basis of a tourism environmental satellite account that for the first time reveals the carbon footprint of tourists' activities when visiting a region (Jones and Munday, 2007). It should not, however, be forgotten that these developments required the re-engineering of TSA structures, effectively to integrate them more firmly into a regional input-output accounting structure thus enabling Leontief-inverse modelling analysis. Whilst this moves away from international recommendations, constitutes a conceptual move from an account to a model and effectively requires the 'parallel' analysis of tourism economic data, these costs have been outweighed by the benefits gained in terms of informing regional policy.

The experience in Wales also implies that a more effective and speedy development of a regional analytical structure for tourism might in fact miss out the stage of developing a fully UNWTO consistent RTSA and move directly to modelling-friendly structures that do not require the construction of a data-intensive commodity-by-industry matrix if this is particularly difficult for regions: this approach of course has both benefits and costs, the latter, particularly in terms of international (and potentially inter-regional and intra-national) comparisons. What is clear is that the growing involvement of UNWTO and its partners at sub-national scale more generally (e.g. in measuring volumes and proposing destination management structures) means that the construction of appropriate statistical and analytical structures at regional level is a topic of great interest. What should not be forgotten is that statistical quality and purity must be balanced with timely publication in a useful form to ensure that the collection of high

quality tourism economic statistics becomes embedded in the activity of regional agencies in a way which as so far been rare.

## References

Archer, B. H. (1984). Economic impact: Misleading multipliers. *Annals of Tourism Research*, 11: 517-518.

Barber-Dueck, C. and Kotsovos, D. (2002) The Provincial and Territorial Tourism Satellite Accounts for Canada, 1996 [www.statcan.gc.ca/pub/13f0063x/4193714-eng.pdf](http://www.statcan.gc.ca/pub/13f0063x/4193714-eng.pdf) (accessed 26th January 2009)

Beynon, M., Munday, M and Jones C. (2009) The Embeddedness of Tourism-Related Activity: A Regional Analysis of Sectoral Linkages, *Urban Studies*, (in press)

DCMS (2004), *UK Tourism Satellite Accounts First Steps Project* Department of Culture Media and Sport [www.dcms.gov.uk/4852.aspx](http://www.dcms.gov.uk/4852.aspx) (accessed 21<sup>st</sup> January 2009)

Dwyer, L. and Forsyth, P. (1997) Measuring the benefits and yield from foreign tourism *International Journal of Social Economics* 24, 1/2/3 pp 223 - 236

EUROSTAT (2003). *European Implementation Manual on Tourism Satellite Accounts*. [ec.europa.eu/eurostat/ramon/statmanuals/files/TSA\\_EIM\\_EN.pdf](http://ec.europa.eu/eurostat/ramon/statmanuals/files/TSA_EIM_EN.pdf) accessed January 26<sup>th</sup> 2009

Fletcher, John (1989). "Input-Output Analysis and Tourism Impact Studies." *Annals of Tourism Research*, 16 (3): 514–529

Frechtling, D. (2008) Measurement and analysis of tourism economic contributions for sub-national regions through the Tourism Satellite Account *Knowledge as Value Advantage of Tourist Destination, Malaga 29<sup>th</sup> – 31<sup>st</sup> October 2008* [www.iafet.com](http://www.iafet.com)

Ho, T. Spurr, R. Pambudi, D., Forsyth, P., Dwyer L. and Hoque S. (2008) *TOURISM SATELLITE ACCOUNTS 2006–07: South Australia Sustainable Tourism Cooperative Research Centre, Centre for Economics and Policy*  
[www.crctourism.com.au/bookshop/BookDetail.aspx?d=613](http://www.crctourism.com.au/bookshop/BookDetail.aspx?d=613) accessed 26<sup>th</sup> January 2009

Jones, C. (2005) "Major Events, Networks and Regional Development" *Regional Studies*, 39, 2, pp 185-195

Jones, C. (2008) Assessing the impact of a major sporting event: the role of environmental accounting *Tourism Economics*, 14, No. 2. pp. 343-360

Jones, C. and Munday, M. (2007) Exploring the Environmental Consequences of Tourism: A Satellite Account Approach *Journal of Travel Research* 46 pp 164-172

Jones, C. and Munday, M. (2008) Tourism Satellite Accounts and Impact Assessments: Some Considerations *Tourism Analysis*, 13, pp 53-69

Jones, C. Munday, M. and Roberts, A (2003) "Regional Tourism Satellite Accounts: A Useful Policy Tool?" *Urban Studies* 40, 13 pp 2777-2794

Jones, C. Munday, M. and Roberts, A. (2009) Top Down or Bottom Up? Issues in the Development of Sub-National Tourism Satellite Accounts *Current Issues in Tourism*, (in press)

Jones, C. Munday, M and Roche, N. (2006) Can Sports Stadia Ever be Economically Significant? Evidence from Cardiff *Regional Science Association International British and Irish Section 37<sup>th</sup> Annual Conference Bangor, Northern Ireland, August 2006*

Keuning, S., van Dalen, J. and de Haan M. (1999) The Netherlands' NAMEA; presentation, usage and future extensions *Structural Change and Economic Dynamics* 10, pp 15 – 37

Kuhbach, P., & Herauf, B. (2005). US Travel and Tourism Satellite Accounts for 2001-04. *Survey of Current Business, Washington: Bureau of Economic Analysis, June, 17-29 2005.*

Leontief, W. (1970) Environmental Repercussions and the Economic Structure: An Input-Output Approach, *Review of Economics and Statistics*, pp.262-71

Miller, R.E. and Blair P.D. (1985), *Input-Output Analysis: Foundations and Extensions* New Jersey, Prentice-Hall, Inc., Englewood Cliffs

NWDA (2005) *English Regions First Steps Tourism Satellite Account Report* North West Development Agency

[www.nwda.co.uk/pdf/EnglishRegions\\_TSA\\_ReportAug05.pdf](http://www.nwda.co.uk/pdf/EnglishRegions_TSA_ReportAug05.pdf) (accessed 20th January 2009)

Patterson, M. and McDonald, G. (2004) *How Clean and Green is New Zealand Tourism? Lifecycle and Future Environmental Impacts* Landcare Research Science Series No. 24, Canterbury: Manaaki Whenua Press.

Smeral, E. (2006) Tourism satellite accounts: a critical assessment. *Journal of Travel Research* 45, pp 92 – 98.

UNSD *et al* (2008) *2008 Tourism Satellite Account: Recommended Methodological Framework* United Nations Statistics Division (UNSD), the Statistical Office of the European Communities (EUROSTAT), the Organisation for Economic Co-operation and Development (OECD) and the World Tourism Organization (UNWTO)

<http://unstats.un.org/unsd/statcom/doc08/BG-TSA.pdf>

Zhang, J (2005) Regional Tourism Satellite Accounts for Denmark: Accounting and modelling *15th International Input-Output Conference, Beijing, China, 27 June – 1 July 2005*

**Table 1 – The Environmental Impact of Tourists’ Spending in Wales (Type II), (2000)**

	<b>Gross Value Added (£m)</b>	<b>CO<sub>2</sub> (kt)</b>	<b>Waste (kt)</b>	<b>Tonnes CO<sub>2</sub> per £1m VA</b>	<b>Tonnes Waste per £1m VA</b>
Day Visitors	554.6	673.7	455.2	1214.7	820.8
UK Tourists	922.7	705.5	755.9	764.6	819.2
Overseas Tourists	125.4	83.3	110.5	664.3	881.2
All Visitors	1602.7	1462.5	1321.6	912.5	824.6

**Table 2 – Economic and Environmental Impacts of Wales Rally GB**

<b>The Economic Impact of Rally GB 2004 – Short Term Expenditure Impacts (Type II)</b>			
<b>£m</b>	<b>Spectators</b>	<b>Teams &amp; other</b>	<b>Total</b>
<b>Output</b>	<b>3.9</b>	<b>3.2</b>	<b>7.1</b>
<b>Earned Income</b>	<b>1.3</b>	<b>1.2</b>	<b>2.5</b>
<b>Gross Value Added</b>	<b>2.1</b>	<b>1.7</b>	<b>3.8</b>
<b>Employment (person years)</b>	<b>115</b>	<b>65</b>	<b>180</b>
<b>The Environmental Impact of the 2004 Wales Rally GB</b>			
	<b>CO<sup>2</sup> (tonnes)</b>	<b>Waste (total kilotons)</b>	
<i>Direct Fuel-related Effects</i>			
Spectators to/from Rally	375	-	
Spectators during Rally	635	-	
Competitors & teams	250	-	
<b>Total Direct Fuel Impacts</b>	<b>1,260</b>	<b>-</b>	
<i>Supply-side TSA &amp; IO Results (inc Type II household effects)</i>			
Spectator spending	950	1.07	
Teams & associated spending	1330	1.88	
<b>Total Supply side</b>	<b>2,280</b>	<b>2.95</b>	
<b>Total Rally-Related</b>	<b>3,540</b>	<b>2.95</b>	

**Table 3 Indicative Structure of a Tourism Economic Account**

Industry	a.	b.	c.	d.	e.	f.	g.	h.	j.	k.
1.1 Hotels, Motels & other serviced accommodation	Regional industry output at basic prices	Taxes less subsidies on products (inc. VAT)	Total regional supply at purchaser prices (a + b)	Day Visitor consumption	Staying tourism consumption	Outbound tourism consumption*	Business tourism consumption (Non-NW businesses)	International inbound tourism consumption	Regional Internal Tourism Consumption (d + e + f + g + h)	TOURISM RATIO ON INDUSTRY SUPPLY (j / c)
1.2 Hostels and non-serviced accommodation										
2.1 Restaurants, bars & catering										
3.1 Railway transport										
3.2 Other land transport										
3.3 Water transport										
3.4 Air transport										
3.5 Ancillary transport & travel agencies										
4.1 Recreation and entertainment										
5.1 Retail and Distribution (inc. fuel retail)										
6.1 Fuel Refining										
7.1 All other regional industries										
<i>Non-regional industries (imports)</i>										

Notes: Tourism *consumption* and *expenditure* can be considered as identical for practical purposes.

Retail & distribution excludes value of goods purchased for resale with no further processing

\* Refers to purchases made in the NW by residents and transit passengers who are embarking on foreign trips