Annex 6

The measurement of the economic impacts of tourism

Tourism, defined as the activities undertaken by visitors, for and while on visits, generates directly and indirectly an increase in economic activity in the places visited (and beyond), mainly due to demand for goods and services that need to be produced and provided. There is considerable interest in measuring the impacts of such increased economic activity, either on a country as a whole or on a region or even a local destination.

Economic impact studies aim to measure economic benefits, that is, the net increase in the wealth of residents resulting from tourism, measured in monetary terms, over and above the levels that would prevail in its absence. This change in wealth might occur not only through increased flows of income to households, but also through the change in net worth induced by the change in market value (positive or negative) of existing assets, both produced and non-produced, as a response to the induced change in demand for such types of assets.

Leaving aside the change in net worth, the change in income resulting from the response of producers to the additional demand associated with visitors can be estimated through different interrelated indicators that might be developed using the Tourism Satellite Account combined with other types of instruments and that relate to value added, employment, remuneration of employees, gross business income, government revenues, etc.

In terms of input-output analysis, three different types of effects are defined: direct, indirect and induced effects.

The *direct effects* take into account only the immediate effects of the additional demand (tourism internal consumption or total tourism internal demand) on production processes and supply of goods and services in terms of additional goods and services, and additional value added and its components.

The Tourism Satellite Account as such only makes it possible to measure the direct effects of consumption on output and value added of tourism industries and other industries serving them (and it is what indicates the term "direct" in tourism direct gross value added and tourism direct gross domestic product). Nevertheless, if only tourism internal consumption is measured, not all direct effects are taken into consideration (para. 4.101).

In order to serve visitors, productive activities require additional inputs: for example, restaurants have to buy and prepare more food, hotels need more housekeeping supplies and public services, aquatic centres consume more cleaning supplies and more water, transport businesses must buy more petrol, fuel and spare parts, etc. Often, additional direct investment is required in order to serve additional customers: more roads, more hotels, more restaurants, more beaches have to be established and cleaned, etc. In response to the initial visitor spending, there is a round of increased demand for goods and services necessary to satisfy visitor demand for goods and services. These

intermediate inputs or capital goods need to be produced or imported, and this, in turn, induces a chain of additional demand for different factors of production (that is, inputs, labour and capital), a phenomenon that continues through several rounds until exhausted by leakages (see below). This chain of effects that enables the activities directly serving visitors is called the *indirect effects* of visitor demand.

The chain of indirect effects of tourism consumption on other industries is due to the *linkages* of industries serving tourism to other industries that supply tourism with intermediate inputs and capital goods, and then with the linkages of these industries with others that supply them, and so on. All these effects generate additional value added, employment, compensation of employees, taxes, income, etc.

In addition, the increase of income distributed to the labour force and to the owners of productive capital resulting from incremental visitor demand generates increased demand for goods and services through a rise in household consumption. This additional demand generates a chain of *induced effects* on a great variety of goods and services.

The overall economic impacts of tourism on the economy are a combination of direct, indirect and induced effects and can be established for different types of economic variables.

Linkages and *leakages* are two phenomena that need to be clearly identified in an economy, as their intensity has important consequences for the magnitude and location of economic impacts related to tourism demand.

Linkages

Industrial statisticians over the world are encouraged to build input-output tables, the purpose of which is precisely to represent the interdependence (the *linkages*) between the different production processes in an economy. The supply and use table that is in the national accounts of a country, when it follows the recommendations of the *System of National Accounts 2008*, is a type of input-output table.

Leakages

Leakages occur when part of the incremental demand generated by tourism and the consequent earnings, rather than being retained by the economy visited, are appropriated by other economies in the form of imports of goods and services to cater to the needs of tourists, or through other forms of distribution and redistribution of the primary income generated by the spending of visitors.

Leakages extend also to the second and subsequent rounds of the production process, that is, they include not only the imports that have been identified as those directed towards direct consumption by visitors, tourism investment or intermediate consumption (input) for the direct service of visitors or for the production of tourism investment goods, (the first round), but also the imported inputs and gross fixed assets necessary for the production of these inputs and investment goods (second round) and then the inputs needed for the production of these inputs and capital goods, etc.

They also include flows related to the distribution and redistribution of income, and the use of domestic income for increased final consumption expenditure that might extend to imported goods. The sum of all these additional imports to the economy and outflows of income would be called indirect leakages and are beyond the scope of many analyses.

Methods used to estimate indirect and induced effects of tourism

The methods used are roughly of three types:

(a) *Models based on Input-output analysis*

An input-output table is a widely used matrix framework to supply detailed and coherently arranged information on the flow of goods and services and on the structure of production costs. All components of final demand are shown by product or industry of origin and intermediate consumption is shown, both by product or industry of origin and by product or industry of destination.

By using an input-output table, it is possible to express the technical relationship between output by product or activity (at basic price) and intermediate consumption (at purchasers price) by product or activity as a technical coefficient, and establish a matrix of technical coefficients in which each cell represents the required value of input **i** for the production of 1 unit value of output **j**.

In order to take leakages into consideration, it is necessary to differentiate locally produced consumption goods and services, inputs and capital goods from imported ones as imported components do not generate a chain of domestic output.

The use of models based on input-output relationships supposes various assumptions that are not always satisfied, in particular:

- A linear relationship between inputs and outputs, expressed through the matrix of technical coefficients;

- Relative stability of these technical coefficients over time as most countries observe them only from time to time; and

- Stability in the shares of locally produced goods and services and non-locally produced goods and services (originated in other country or in other region of the same country), that is, no substitution between the origins of the products.

In the case of tourism, the application of input-output models is further complicated by the fact that tourism consumption includes elements that do not belong to final demand but to intermediate consumption of activities developed by resident producers.

Calculations based on such types of models require not only the use of a developed Tourism Satellite Account but also of a developed System of National Accounts. Additionally, this system should incorporate not only a detailed supply and use table, but one where it is possible to identify separately the imported component of each of the cells representing inputs of all industries, as well as of internal tourism consumption (or of total tourism internal demand). It would also be necessary to identify, within tourism gross fixed capital formation, its imported components.

(b) *Computable general equilibrium models*

Although based on similar types of data and assumptions, computable general equilibrium models are designed to relax some of the constraints inherent in input-output models, in particular price variation constraints. With these types of models, the supply and use table compiled for a given year represents a situation of equilibrium between the different variables of the system. Tourism generates changes in some of the variables, and the model, usually an optimization model, computes a new equilibrium situation under the conditions imposed by the vector of tourism demand and the relationships that exist between the different variables of the supply and use table. These relationships are modelled. They might have any type of form and are not necessarily linear. Additionally, these models might take into consideration other types of

response to increased demand, including effects on prices of inputs, capital and labour, if capacity cannot respond to this increase in the short run.

These complex models are iterative and usually converge towards a unique solution, given a vector of demand.

Unlike input-output models whose form, operation, data requirements and interpretation are widely known and agreed upon, computable general equilibrium models vary in data required, assumptions and structure. Many are proprietary and not explicated for public evaluation or use, making them less fit for international comparisons.

(c)   *Multipliers*

Both procedures are technically complex and have enormous information needs. For this reason, analysts sometimes use exogenous multipliers (estimated from other economies or regions) that convert the value of tourism consumption (total or by product categories) into estimates of the indirect and induced effects.

These multipliers are of various kinds. Some of them relate the change in the variable being observed (value added, employment, government income) to the initial tourism expenditure. Others relate direct plus indirect and induced effects on a variable (for example, labour compensation) to direct effects of the same variable and for that reason are called ratio multipliers.

Because of their oversimplification, and because they usually do not rely on a detailed description of the specificity of tourism and of the economy under study, the use of exogenous multipliers gives only approximate results.