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**July, 2017**

## DECLARATION

I declare that “*The income and employment multiplier effects of tourism. The case of Rwanda*” is my own work, that it has not been submitted for any degree or examination in any other university, and that all the sources I have used or quoted have been indicated and acknowledged by complete references.

Haruna SULEIMAN

Signature .....

July, 2017

## **CERTIFICATION**

This is to certify that this thesis is a study carried out by Haruna SULEIMAN under my guidance and supervision.

Supervisor Dr Richard KABANDA

Signature .....

July, 2017

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I am indebted to the following people and institutions that played a direct or indirect role in the achievement of this work.

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## **DEDICATION**

This thesis is dedicated to you, my sweetheart, loving wife, TAWA, for your undying support and love during this challenging journey. You have sacrificed a lot to stay alone, far away from your husband, and doing the parenting work alone. I am really humbled by your undying support and honored to have you as a wife.

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## **ABBREVIATIONS AND ACRONYMS**

AIPA	: African Institute for Policy Analysis and Economic Integration
ANP	: Akagera National Park
BNR	: Banque Nationale du Rwanda
CGE	: Computable General Equilibrium
EICV	: Enquête Intégrale sur les Conditions de Vie des ménages
GDP	: Gross Domestic Product
I-O	: Input Output
LDCs	: Least-Developed Countries
MINECOFIN:	Ministry of Finance and Economic planning
NGO	: Non-Governmental Organisation
NISR	: National Institute of Statistics of Rwanda
NNP	: Nyungwe Natural Forest Park
ORTPN	: Office Rwandais de Tourisme et des Parcs Nationaux
PPF	: Production Possibility Frontier
RIPA	: Rwanda Investment Promotion Agency
RRA	: Rwanda Revenue Authority
RWF	: Rwandan Francs
SAM	: Social Accounting Matrices
SD	: Standard deviation
TSA	: Tourism satellite account
UNECA	: United Nations Economic Commission for Africa
US\$	: United States dollars
VNP	: Volcano National Park
WTO	: World Tourism Organisation
WTTC	: World Travel and Tourism Council

## ABSTRACT

The growing popularity of developing countries as tourist destinations in recent years has stimulated a considerable body of research on the developmental benefits inherent in tourism. Developing countries have been attracting tourists mainly due to their natural resource endowments, considered a vital determinant in this newly-found source of their comparative advantage. After accounting for all the explicit and hidden costs linked to this natural resource-based tourism, the sustainable expansion of the tourism sector is claimed to be contributing substantially to economic growth.

Studies to date have investigated the rising share of tourism in macroeconomic output, but have paid limited attention to the economic mechanisms through which tourism supposedly leads to broader development. This study seeks to contribute to filling this gap in our knowledge of the economic dynamics associated with tourism. More specifically, the goal is to shed light on the channels through which tourism contributes to economic growth and to derive tourism income and employment multipliers to estimate its developmental benefits for Rwanda.

Our refined multipliers to capture the total effects of tourism to the economy confirm that through its powerful inter-sectoral linkages, tourism improves the economic wealth of many developing countries including Rwanda. Deeper analysis of the macroeconomic consequences of the expansion of the service sector however suggests that, under some conditions, this could exhibit “Dutch Disease” effects. Tourism generates substantial foreign earnings and its development is strongly correlated with the shrinkage of the traditional primary exports (agriculture in many developing economies), as it triggers exchange rate appreciation in line with the predictions of the conventional ‘Dutch Disease’ model.

As a case study, the analytical model developed in this thesis is tested using Rwandan data. The findings show that tourism contributes significantly to Rwandan economy through income and employment generation. With an elementary input-output framework to guide the empirical analysis, tourism multipliers in the order of 2.713 for income and 3.122 for employment are estimated for the year 2015. Furthermore, these income and employment multipliers obtained are used to simulate tourism growth under different scenarios and enable us to derive plausible and pertinent policy recommendations.

July, 2017

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## **CHAPTER ONE: GENERAL INTRODUCTION**

### **1.1. Introduction**

Tourist arrivals in Least Developed Countries (LDCs) increased by 51% between 2010 and 2015, as against a growth rate of 36% in developed countries and a 19% global growth rate (WTO, 2016). Likewise, international tourism revenue (at current prices) grew by 79% in LDCs compared to 45% worldwide. According to the world tourism barometer, in the first four months of 2016, international tourism arrivals worldwide expanded by 6.5 %. Africa and the Middle East were the leading continents in terms of tourism growth, with the sector expanding by 13% in each region (WTO, 2016). Although a slowdown in growth has been forecasted for 2018, it is still projected to be in the order of 7%, which is consistent with the tourism 2020 vision of the WTO.

### **1.2. Background to the study**

Rwanda is a landlocked and underdeveloped economy undergoing remarkable sectoral shifts. Official indicators show that agriculture contributes more to gross domestic product (GDP) and employment (mainly subsistence farming) than industry. For example, in 2015, the contribution of agriculture was in the order of 39%, whereas for industry, it was only 14%. What a comparative assessment of the sectors also reveals is the astonishing rise in the service sector. Whereas its contribution stood at around 35% in 1990, by 2015, it grew to 45 % of total economic output (NISR, 2016). This means that the service sector (including tourism) has grown faster than other sectors, but it has also overtaken them (displacing the traditional sector) to be the dominant sector.

However, in terms of employment, farming remains the main job provider for the majority of Rwandans despite the fact that it offers little income to farmers. Agriculture in Rwanda is a labor intensive and low-productivity sector. The last survey on households' living conditions (EICV: enquête intégrale sur les conditions de vie des ménages, in French) indicates that many households in Rwanda cultivate very small plots of land- less than 0.2 hectares per family for about a quarter of the rural population. But this farming activity is marginal because at least 0.7 hectares is the minimum required size of land that can feed a typical Rwandese family (NISR, 2016). This has serious implications for people's living conditions. In addition, the fact that a sector that occupies above 80% of the active population contributes to less than 50% towards the country's GDP, can be seen as a threat to the country's economic development. Given the subsistence nature of agriculture in Rwanda, it follows that many people do not have extra income to pay for basic needs, such as the education of their children. This situation accounts for the depth of chronic poverty in Rwanda. Likewise extreme poverty line (based on the cost of a basket of basic foods

only) was estimated to be RWF 45,000 per adult per year. However, a subsequent the last showed an improvement in living conditions and a drop in the proportion of people living in poverty. This proportion changed from 60% in 2010-2011 to 57% in 2014-2015. It is nevertheless important to mention that poverty in Rwanda is disproportionately a rural phenomenon since 92% of poor people live in rural areas and yet 83% of the overall Rwandan population is located in rural areas (NISR, 2016).

The tourism sector in Rwanda is still in its early stages of development. The contribution of tourism to the Rwandan economy, although small (given the approach used which is believed underestimates its contribution), is not something to be ignored. Tourism is classified as a service sector. In Rwanda, the service sector has grown for the past five years (2011-2016). It thus has become the main contributor to GDP for the above period. Indicators show that the growth of the service sector is mainly attributable to the tourism, transport and communication sectors among others. Tourism in Rwanda has the potential for employing many people and for generating income for many households. It has the potential for stimulating economic growth through its powerful sectoral linkages and through its foreign earnings. However, failure to recognize the benefits attached to the tourism sector in an LDC context such as Rwanda, can lead to poor performance of the economy.

Despite the potential that the tourism sector in Rwanda offers, it is not yet promoted properly. Because tourism does not appear as a separate sector in the system of national accounts, insufficient data is available which would help develop sound research and provide sufficient information on the tourism sector. As stated above, it is essential for Rwanda to consider how to expand the base of its economy in order to accelerate its growth, to enhance people's capacity to generate income and employment and to alleviate the extreme levels of poverty.

### **1.3. Research problem and questions**

Positive impacts of tourism are being increasingly observed in many countries. However, its contribution to economic development in many developing countries, including Rwanda, is not fully appreciated for different problems including poor infrastructure. This problem reduces the contribution of tourism to the income generation and employment creation. The contribution of tourism to economic development owes its performance to its backward and forward linkages. Tourism contributes to a country's GDP, the creation of income and employment and the increase of foreign earnings.

However, approaches used to assess the contribution of tourism to these macroeconomic indicators only give a partial picture of the sector's value addition to GDP. In many developing countries, only primary (direct) impacts are considered to be tourism's contribution, ignoring secondary (indirect and induced) effects which are equally important in assessing the impact of tourism. In the light of the above, what needs to be investigated is how to improve this estimation of the contribution of tourism to economic development. In this context, the main problem investigated in this study is the following:

How to improve the estimation of the contribution of tourism to economic development?

Flowing from this problem, this study seeks to answer the following specific questions:

- Through which channels does tourism contribute to economic growth?
- To what extent does tourism create income and employment?

#### **1.4. Research objectives**

The overarching goal of this research is to investigate how much tourism adds to economic growth based on Rwandan data by developing a coherent and robust theoretical and methodological framework and by analyzing the channels through which tourism contributes to economic development.

#### **1.5. Research methodology**

To gather information related to income and employment in the tourism sector in Rwanda, a purposive survey was conducted of tourism business establishments, specifically hotels with international standards that accommodate tourists. Both workers and owners in these tourism business establishments were considered for the survey. A sample population was drawn and determined using purposive sampling and stratified random sampling.

To estimate the impact of tourism income and employment on Rwandan economy, multipliers has been calculated and the effects has been generated from input output (I-O) tables. These tables have been constructed for three tourism-related sectors, Tourism, Agriculture and Transport, and have been used to assess the direct, indirect and induced effects of tourism on income and employment in Rwanda.

#### **1.6. Significance of the study**

This study is significant in that because it investigated broad debate on tourism development and its macroeconomic contribution. The study also examined important issues in tourism and demonstrated that the sector possesses potential that can benefit many developing economies, including Rwanda. It also added the general knowledge of tourism multiplier effects and extends its analysis by looking at the possibility of the Dutch Disease

effects in the case of the service sector over traditional export sector. Furthermore, the study estimated tourism income and employment multipliers to be able to capture the benefits of the tourism sector on the rest of Rwandan economy.

This research contributed to the little available research on tourism in Rwanda. By showing the potential for the tourism sector to boost Rwandan economy and by making recommendations that help to develop the sector, this research benefits the country.

### **1.7. Limitation and delimitation of the study**

Given the complexity of the tourism sector in Rwanda, it was not possible to tackle all the wide-ranging factors of tourism and all of its economic impacts. This study has been limited to investigating the income and employment multiplier effects of tourism in Rwanda. The study carried out on hotels of international standards in Rwanda. These hotels are major components of tourism business establishments. The rationale for this choice was twofold. Firstly, tourists spend a lot of their income on hotels (accommodation, food and beverages). Although tourists visit different tourist attractions such as national parks, it is suggested that a large proportion of tourists' expenditure goes towards expenses at hotels. It is important to mention that on-site accommodations at parks are very limited and that hotels with international standards are located outside the parks. Secondly, hotels with international standards have been considered because they are the ones that accommodate the majority of tourists from all over the world. Therefore, these hotels are expected to have a greater impact than other tourism businesses.

Furthermore, the income and employment multiplier effects of tourism in Rwanda have been estimated using data for the year 2015. The rationale to conduct the study based on this particular year is also twofold. Firstly, the I-O model used to estimate direct, indirect and induced effects of tourism income and employment require having data for one year (a reference year). This is because changes can occur from one year to another, and also tourism impacts have been assessed with reference to a particular year. Secondly, the rationale for choosing a recent year such as 2015 is that information and data of a recent year are usually expected to be available given recent records. Lastly, the limitation to this study is related to data. In Rwanda, as in many LDCs, statistics are highly inaccurate and in some extreme cases data may present discrepancies from one department to another and yet they are both dealing with the same issue. There are gaps in the statistics of Rwanda, particularly from the early 1990s up to 1994 as a result of war and genocide. However, even out of this bleak period, statistics are generally poorly recorded for research purposes.

Despite this weakness concerning data, an attempt have been made to overcome this problem by collecting additional data through a survey that have been conducted to supplement information gathered elsewhere. Furthermore, the data reliability gap has been filled by collecting data from different services in different departments dealing with the issue under investigation.

### **1.8. Organisation of the thesis**

The present thesis has been organised around 5 chapters. The first chapter introduces the whole thesis. A background to the study is provided, where different issues relating to the topic investigated are highlighted. From the background presented, the problem statement is given and the research questions are raised. Following this are the objectives of the study, the research methodology, the significance of the study, the limitation and delimitation of the thesis and the organization of the thesis. The second chapter of the thesis dealt with the literature review on tourism economic impacts and multiplier effects. In this chapter, the role of tourism to economic development have been developed and analyzed. The third chapter points out the methodology to be used for responding research questions. In this chapter different approaches have been used to conduct this study and to answer the research questions. The fourth chapter points out presentation, analyzes and interprets findings from data collected. Fifth chapter summarizes the findings, conclude the thesis and draw recommendations and discusses policy implications.

## **CHAPTER TWO: LITERATURE REVIEW**

### **2.1. Multiplier effects of tourism**

Conceptually, the term multiplier effect refers to a change in an economic activity as a result of a change in action in some other sectors (Pao, 2005; Akundi, 2003, Stynes and Sun, 2003). Specifically in tourism, the multiplier effects reflect the final change in output in an economy resulting from the initial change in tourist spending (Ennew, 2003). It is a phenomenon where the effects of tourist expenditure are not limited to companies where the money is directly spent. This multiplier effect is the chain of effects resulting from a change in tourist expenditure (Baaijens, Nijkamp and Van Montfort, n.d: 2010).

This means that every spending a tourist undertakes in a visited area has an impact (big or small) not only on the final output in the rest of the economy, but also all the way through on the process of spending. Tourism multipliers are central to any measurement of tourism economic impact and are very useful in LDCs. Literature on the subject distinguishes five different types of tourism multipliers frequently used (Pro-Poor Tourism partnership, 2004; Ennew, 2003). These are: income multiplier, employment multiplier, sales multiplier also known as transaction multiplier, government revenue multiplier and output multiplier. Sales multiplier reflects additional business revenue generated in the economy following a change in tourism expenditure. Government revenue multiplier informs on the impact on government revenue resulting from all sources connected with an increase in tourism expenditure. Output multiplier in tourism reflects an additional output produced in the economy as a result of tourism spending.

All these tourism multipliers are important, but in the context of developing countries, income and employment multipliers are of particular interest. This is because the development of tourism in LDCs through income and employment multipliers provides opportunities to these countries to reduce widespread unemployment and to improve their people's wellbeing. In this study the focus is particularly on tourism income and employment multipliers because of their important role in a LDC context. More details on these two multipliers are presented in what follows.

#### **2.1.1. Income and employment multipliers in Tourism**

The tourism income multiplier is referred to as an additional income injected into the economy as a result of an increase in tourism spending (Cooper et al, 1998; Song, 2000).

The income generated as a result of tourism can take the form of wages and salaries, rent, interest and profits depending on the status of the beneficiary. Likewise, tourism employment multiplier serves to inform on the total number of jobs created by an additional unit of tourist expenditure. Tourism income and employment multipliers are useful information tools in this study, not only because they provide details of tourism impacts (direct, indirect and induced), but also because these two aggregates are important in a developing country such as Rwanda. Many LDCs are characterized by a high rate of unemployment and many people living in poverty. It follows that investing in a sector such as tourism, which is highly labor intensive, helped the developing country to reduce the level of unemployment. Also the extent to which tourism creates income is of great importance in a LDC context because it reveals the degree of wellbeing of local residents brought by tourism development in the area.

### **2.1.2 Channels of income and employment effects of tourism**

The effect of tourism on income and employment generation is observed at different levels (Carstensen, 2003; Burrell, 2003; Pao, 2005). Tourism creates income and employment directly into sectors that are connected to it in order to supply tourist goods and services. These effects are referred to as direct effects. They are also known as primary effects. Recent literature suggests that direct effect multipliers in tourism translate direct sales (spending) to the income, value added and employment linked with visitor spending in tourism sectors (Ennew, 2003; Sugiyarto et al., 2003).

According to these authors, direct effects represent changes in the economic activities resulting from the first round of spending in the tourism industry. In addition to these direct effects, sectors that supply directly to the tourism industry use the income they have received from tourism to buy their inputs from other industries in order to produce and satisfy the demand from the tourism industry. This effect is known as the indirect effect of tourism. It is called indirect because industries in this category do not deal directly with the tourism sector or the tourist consumer itself.

Another level of effects is induced effects, the income generated in tourism-related industries is not all used for purchasing inputs to produce goods and services for tourist. A portion of it is consumed by households for their own different needs. In that sense the income from the tourism sector used to purchase other than tourist-related goods and

services create induced effects. Both indirect and induced effects are also known as secondary effects of tourism. The same logic is applicable to employment in tourism. This spending affects positively many economic sectors which involve, for example, housing, food and beverages, transport, education and many more goods and services that consumers require. This process of spending and respending generates more sales, income and employment throughout the country's economy (Sugiyarto et al., 2003).

### **2.1.3. Illustration of tourism multiplier effects and their importance in LDCs**

The tourism industry distributes income to businesses in exchange for goods and services bought to satisfy tourist demands. These businesses employ different people including local residents to produce and supply goods and services to the tourism industry. Likewise the tourism industry itself employs a labor force from households to respond to its clients' needs. In this regard, tourism distributes wages to households in response to the labor offered. Tourism is also linked to government in a direct way. It increases government revenues by paying for tourism-related taxes and fees. These include, among others, airport fees (entry visas), taxes related to tourist consumption of goods and services at their hotel place, on the site, etc. The direct effects reflect the value added or the contribution to GDP resulting from the spending of local and foreign tourists in the local economy (South Africa Foundation, 1999).

However, it has to be noted that in addition to tourism products that tourists consume, they also use imported goods such as drinks. Unfortunately, most developing countries are not capable of satisfying all tourists' needs using their local production because of their limited production capacity. Furthermore, the tourism industry may also import furnishings for the hotels. The money used to import goods and furniture to satisfy the needs of tourism, constitutes a leakage out of the host country. This leakage in most cases comes from capital import or investment spending to satisfy tourists' needs. "Leakage is the process whereby part of the foreign exchange earnings generated by tourism, rather than being retained by tourist-receiving countries, is either retained by tourist-generating countries or repatriated to them" in various forms (Diaz, 2001: 168).

In their study, Kweka et al. (2003) find that tourism is among the most interlinked sectors in and with the rest of the economy. They indicate that every activity in the tourism sector is connected to other activities in other sectors by forward and backward linkages. For instance, to satisfy tourist demand, the tourism sector is not only need tourism products such as natural attraction and tourism resorts, but also depends on the transport, agricultural, financial, construction sectors and many others. This brings one to the fact that

the tourism sector is an important catalyst sector and that the more developed the sector becomes, the more impacts it has on other economic sectors as a result of multiplier effects across sectors.

Tourism in LDCs gives opportunities to small-scale businesses to develop, including those operating in the informal sector. These opportunities are very important in areas such as agriculture, food processing, transport, distribution etc. Tourism is strongly linked with the informal sector where a large number of less fortunate people get involved. For instance, the presence of street vendors selling handicraft are an example all over the world which can illustrate this case. Because tourism is a labor-intensive sector, its development can take advantage of using cheap and available local labor in LDCs instead of employing expatriates who, in most cases, are expensive. Tourism can be one of the main sources of income for the majority of African countries. It can support the majority of its population living in poverty by offering them opportunity to employment and to income generation. Tourism can also serve in some cases as a secondary job to supplement income earned in the primary job. The development indicators establish that close to 50% of Sub-Saharan African population depend on less than US\$ 1 per day (World Development indicators, 2011).

It is important to note that tourism in Africa, more than anywhere else, is based on natural and cultural resources. These assets are among the few that are owned by the poor. So it can be seen that by developing tourism, this not only gives hope to the poor in LDCs, but is also a source of diversification in economic activities of these economies (UNECA, 2013).

## **2.2. Economic models for measuring tourism multipliers**

Measuring tourism multipliers has been a challenging task for many researchers, as it has been and still is difficult to isolate the tourism sector from other interconnected economic sectors. Although tourism multipliers are difficult to measure, it is only when there is a right picture of what the sector contributes to the economy that it can be valued. Different models have been developed and used to measure tourism multipliers. Depending on the purpose of the researcher and the availability of data, one model could be preferable to others. However, findings from recent studies point out that there is no single model that could be called perfect to accurately measure tourism impacts (Pao, 2005; Carstensen, 2003; Styne et al. 2000). The fundamental problem in measuring tourism impacts comes from the fact that tourism does not exist as a distinct sector in any system of national accounts as confirmed by Pao (2005).

There are quite a number of economic models and approaches used to estimate tourism economic impacts, but for the scope of this study, analysis is limited to models that measure tourism multipliers. Four models and one approach are considered for review and discussion: these are mainly Keynesian model, Input Output (I-O) model, Social Accounting Matrices (SAM) model, and to a lesser extent, Tourism Satellite Account (TSA) approach and Computable General Equilibrium (CGE) Model.

### **2.2.1. Keynesian multipliers model**

The concept of Keynesian multiplier communicates an exogenous injection of spending to the total effects it creates on various macroeconomic aggregates. It rests on a theoretical base found in the Keynesian model of aggregate demand within an open economy (Hernández, 2001). The Keynesian multiplier model is based on identifying flows of income and employment that are generated in rounds.

According to WTO (2011), these flows diminish in geometric progression as a result of leakages at each round. Although there is leakage at each round of spending, it is important to understand that it is not only direct effects that matter in tourism multipliers, but also indirect and induced effects which are equally important especially for LDCs. The first direct impact tourism creates in an economy is just a starting point for circulating income in the visited country if the level of leakage is insignificantly low. The income generated might not be enough, but the fact that it can still create a job and generate income is meaningful. It is possible that a created job at third or fifth level only generates very little pay. The Keynesian model used to estimate tourism multipliers is formulated by Archer (1982) as follows:

$$\text{Multiplier} = \frac{1}{1-c-m}$$

Where **c** stands for the propensity to consume, and **m** for the propensity to import. Basically this model determines the multiplier by dividing a unit of tourist spending by the proportion of the spending that leaks out of the economy as a result of savings and imports. In this model savings are considered as leakages because they limit income circulation in the short run, therefore reducing the size of income multiplier. This Keynesian model for tourism multipliers involves two important things: the propensity of different visitors to consume and the share of tourists spending that go to other industries. If tourist propensity to consume local products is high, it follows that benefits to local people selling those products is important as mentioned earlier. The propensity to import goods and services is also important to know. The higher the propensity to import is, the lower the resultant value

of the multiplier, and hence the lower the benefit to the economy. Keynesian multipliers are calculated based on leakages in the economic system (Cooper et al. 1998).

The model seeks to present a single figure that represents output, income, employment, sales or any other multiplier of interest. These multipliers are simple to determine since they do not require more detailed data. However, Keynesian multipliers are less informative because of the restrictions used in the model. More criticism of the Keynesian model is made in the next section.

### **2.2.2. Input-Output (I-O) model**

The input-output model is used to translate the different linkages that exist between economic sectors. These relationships are presented in the form of a matrix (O'Connor and Henry, 1975). I-O model originates in the research done by Wassily Leontief in the 1930s (Akundi, 2003). It is a method of tabulating the whole economic system in the form of a matrix known as I-O tables, for which rows represent the sales by each economic sector to each of the others and the columns represent the purchases each sector does from each of the other economic sectors. In the case of the tourism sector, the I-O model informs on how much the tourism sector sells to other economic sectors and how much it purchases from each of them. I-O model analyses the effect of tourism multipliers by tracking the movement of tourism initial spending through different economic sectors. A simplified I-O model is given in the following formula (Jensen and West, 1985; Pao, 2005):

$$\mathbf{K}_t = (\mathbf{I} - \mathbf{A})^{-1}$$

Where  $\mathbf{K}_t$ = multiplier  $\mathbf{I}$ = identity matrix (initial dollar spent by a tourist)  $\mathbf{A}$ = technical coefficients

Given its ability to provide accurate and detailed information, I-O analysis has been increasingly used to estimate tourism economic impact. Fletcher (1997) and Akundi, (2003) point out that the key strength of I-O analysis comes from the fact that it details information regarding direct, indirect and induced effects of tourism on the local economy. It is appropriate for determining the multiplier sizes in tourism. The use of I-O model to determine tourism multipliers in a LDC context is very useful because of the detailed information it provides. Tourism has been identified as a sector with large induced effects with strong sectoral linkages than other economic sectors. For that reason tourism calls for meticulous estimation of all its effects (direct, indirect and induced). The I-O model helps

to answer the question of how much income and employment tourism generates at direct, indirect and induced levels.

### **2.2.3. Computable General Equilibrium (CGE) model**

Historically, CGE models have their origin in I-O model and have been developed to overcome gaps in the I-O model. Unlike I-O model, CGE models are more concerned with detailed behavior of economic agents rather than sectors transactions (Pao, 2005). Treating an economy as a whole, CGE model allows for reaction from one sector to another. It takes into consideration the price fluctuation while making a detailed inter-industry analysis. The construction of the model involves the process of setting up a series of markets (for goods, services and factors of production), a production sector and a household demand sector (Blake et al. 2006; Sugiyarto et al. 2003; Sinclair et al., 2002).

CGE models are uniquely appropriate for analyzing a range of development planning and policy issues (Roberts, 2000). A CGE model consists of a set of equations describing the structure of an economy in a way that factor and commodity prices are endogenously fixed to respond to particular market-clearing conditions. In addition to that, demand and supply in each market are obtained from an optimum choice driven by the behavior of the economic agent who reacts to relative prices. The model also includes basic macroeconomic constraints. Practically, each market, sector or household is characterized by its own economic rules that allow it to react to external changes. The CGE model in this regard can represent different scenarios where economic conditions for each sector have been put in place to allow for reactions in economic changes. It is this flexibility that gives CGE model advantage over other forms of modelling (Blake et al. 2003). Schematically, CGE Model can be written as follows (Pao, 2005):

$$\mathbf{F}[\mathbf{X}(\mathbf{t}), \mathbf{Y}(\mathbf{t}), \mathbf{Z}(\mathbf{0})] = \mathbf{0}$$

Where  $\mathbf{X}$ : Vector of endogenous variables  $\mathbf{Y}$ : Vector of exogenous variables  $\mathbf{Z}$ : Vector of initial conditions. CGE models have been used more often in fields such as international trade, agricultural economics, environmental economics and economic development. It is only in past few years that such models have been introduced into the field of tourism (Dietzenbacher, 2005; Pao, 2005).

### **2.2.4. Tourism Satellite Account (TSA) approach**

Tourism satellite account is another approach used to measure tourism economic impacts. It is an extension of the I-O model of the system of national accounts, which is the reason

why the word ‘satellite’ is used in its description (Smith, 1997). Developed in the 1990s by the World Travel and Tourism Council (WTTC), TSA is a useful system for estimating the overall economic impact of the tourism sector at the national level. However, this system does not allow for tourism economic impacts assessment at local levels (WTTC, 1996). Given that national accounts are organized around a set of industries or commodities, it is not easy for the system to distinguish what belongs to tourism and what is not from tourism. For example, given a restaurant serving both tourists and local residents, it is very difficult for the TSA to distinguish one from the other; hence computing only the sector “restaurant” without making any distinction. Consequently, estimating tourism effects is result either in overestimation or underestimation of its impacts given the kind of information used. Unlike other models presented above, TSA is a model that concentrates solely on measuring direct and indirect effects of tourist spending, leaving out the induced effect which is of great importance in tourism multipliers.

#### **2.2.5. Social Accounting Matrices (SAM) model**

The social accounting matrices are designed to characterize the structure of an economy. The model reflects the transactions that take place between economic sectors, generally for a period of a year. The SAM is presented in a form of a square matrix where columns represent expenditures and rows represent receipts of the accounts that correspond to different institutions and activities, taken into consideration (Taffesse and Ferede, 2004). Because SAM is an accounting framework, its corresponding column and row must equalize. The SAM covers all the activities of an economic system from production, consumption, accumulation to distribution. According to Sadoulet and De Janvry (1995).

SAM is an extension of the I-O model which divides the accounts into endogenous and exogenous accounts. It assumes that the column coefficients of endogenous accounts are all constant. The important thing for SAM is to determine which accounts to consider as exogenous and which should be set as endogenous. Endogenous accounts assume that changes in income are followed directly by changes in expenditure, while expenditures for exogenous accounts are set independently of the income. Common practice, however, shows that one or more accounts from government, capital and the rest of the world are chosen to be set as exogenous accounts, depending on the objectives of the study.

SAM model can be illustrated as follows (Sadoulet and De Janvry, 1995):

Endogenous	Sum of exogenous	Total
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	accounts (n)	accounts (1)	
Endogenous accounts (n)	$AX$	$F$	$X$
Exogenous accounts (m)	$BX$		$L$
Total	$X'$		

Where  $\mathbf{X}$  is the vector of total income or expenditure of the endogenous accounts;  $\mathbf{F}$  the vector sum of the expenditure of the exogenous accounts;  $\mathbf{L}$  the column vector of the income of the exogenous accounts;  $\mathbf{A}$  the square matrix (n x n) of coefficients with endogenous accounts,  $\mathbf{B}$  the rectangular matrix (m x n) of the coefficients with exogenous accounts as rows and endogenous accounts as columns. If we represent the operator ‘change’ by, then the following may be defined:

The matrix of multipliers	$\mathbf{M} = (\mathbf{I} - \mathbf{A})^{-1}$
The vector of shocks	$\mathbf{F}$
The vector of impacts	$\mathbf{X} = (\mathbf{I} - \mathbf{A})^{-1} \mathbf{F}$
The leakages	$\mathbf{L} = \mathbf{B} \mathbf{X}$

In the above model, a shock is a result in change of elements of the exogenous accounts. It is important to note that SAM multipliers are completely demand-driven. Leakages are provided by the coefficients in the rows of the exogenous accounts. SAM multipliers inform on the impact of a given sector, such as tourism on the economic system, such as the structure of production, labor income, households wages, government revenues, imports and savings. Multipliers obtained using SAM model are higher than the ones from I-O model. This is explained by the fact that value added in I-O model is treated as a leakage and only intermediate demand is considered for multipliers. However, the SAM model treats the value added and income as demand linkages (Sadoulet and De Janvry, 1995).

As seen above, different options exist for tourism multipliers measurement. However, depending on the availability of data and its accuracy in responding to the objective of the research, one model can be preferred to others. In the next section, the shortcomings of the economic models used to estimate tourism multipliers are discussed and an alternative approach suggested.

### **2.3. Shortcomings of models**

Although I-O model is appropriate for estimating tourism multipliers because it gives a much greater understanding of sectoral linkages, it also presents some shortcomings. The model is criticized for being data-intensive and as such, makes its use very expensive both in time and price. The use of secondary data in the I-O model is unsuitable because this secondary data can be misleading, since it is not always accurate at the level of detail required by the model (McCatty and Serju, 2006).

Furthermore, intersectoral transactions needed in the I-O model are rarely available in most LDCs. This means that much of the data has to be obtained by conducting surveys. The use of I-O model requires the existence of a complete, balanced and up-to-date I-O tables that provide values of sectoral transactions from which a multiplier matrix is derived. The I-O approach is also classified as an inflexible model, since it does not allow for factor substitution between sectors and considers prices as given (Zhou et al, 1997).

The model assumes that when tourism spending changes, wages and prices remain unchanged. However, as argued by the above authors, a change in tourism spending is accompanied by a change in both output and prices. Should the change in tourism expenditure be significant, this calls for businesses to expand to respond to the increased demand. As a result, prices and wages in these businesses might be expected to rise. The nature of changes in prices and wages is different from changes in markets but what is important is to emphasize that a change in tourism expenditure impacts the quantity supplied and the change in prices. Therefore it is ideal that any attempt to measure tourism multipliers should take these effects into consideration. As regards CGE model, Nelson (2003) and Song (2002) criticize it for having too restrictive and unnecessary assumptions.

According to these authors, CGE model does not allow for structural change and experiences data limitation as for I-O model. In the use of CGE model, inflation would not affect the results unless the model assumes the money illusion and models it (McDonald, Reynolds and Van Schoor, 2006). The model is very costly to construct and requires significant investments to generate accurate data needed for tourism impacts analysis. Patterson et al. (2004) and Yusaku (2002) accuse the Keynesian models of being unable to address the nature of economic linkages among sectors and suggest that the inter-sectoral relationship cannot be examined with this model.

The model focuses only on an aggregates (non-sectoral) picture of tourism spending impacts which are unable to address the nature of sectoral linkages. This is due to the fact that Keynesian model uses data obtained from other studies on the behaviour of households and firms without considering detailed information on individual sectors. The model is less rigorous than other models such as input- output model. Given the above, Cooper et al. (1998) find that Keynesian multipliers give a limited and partial picture of tourism multipliers. Another shortcoming of the Keynesian model is its way of estimating the initial injection of tourism expenditure into the economy. Keynesian model does not consider leakages at the initial level, yet it is important to adjust the injections downwards in order to allow leakages before estimating the multiplier effects Roberts (2000).

It is argued that some of the gross injection may leak out of the system even before producing any multiplier effects. Furthermore, the size of direct leakages from an economy is related to the type of expenditure. For instance, there is a high likelihood that tourist spending on travel to and from the host country has higher leakages than tourist spending on food and drinks on the site. According to Stynes (2002) and Burress (2003), many studies do not take into consideration the fact that goods and services purchased by tourists are not necessarily produced locally. They do not include the import-leakages attached to tourism products. This results in inflated tourism multipliers, which give a wrong image of the real effect of the tourism industry in the region.

Carstensen (2003) and Dietzenbacher (2005) criticize TSA model for having difficulties in identifying and defining tourism products and does not take into account tourism costs. The model, in this case, can lead to erroneous results that under or over estimate the tourism economic impacts. Moreover, the model is not applicable to local levels to assess tourism impacts. Regarding the SAM model, the critique is that the model presents difficulties in identifying activities. It presents confusion related to commodity disaggregation. Each of the activities in the SAM model is intended to represent a productive agent. In that sense firms aggregated under each heading must have the same production function, using unique technology and presenting similar distribution of factor income (Sadoulet and De Janvry, 1995).

## **CHAPTER THREE: RESEARCH METHODOLOGY**

### **3.1. Introduction**

In the chapter two, the income and employment multipliers effects of tourism were explored. Different approaches used to measure the size of tourism income and employment multipliers were discussed and the difficulties attached to this assessment explained. In the present chapter, the methodology used for this study is developed. Essentially this research is about assessing the income and employment multiplier effects of the tourism sector in Rwanda. From existing studies, difficulties related to assessing tourism economic impacts have been raised (McCatty and Serju, 2006, McDonald, Reynolds and Van Schoor, 2006; Stynes, 2002; Burress, 2003).

The main challenge in determining tourism economic impacts was due to the nature of tourism activities itself where it was difficult to distinguish what belongs to tourism and what does not. Even in many national accounts, tourism does not exist as a separate sector and what precisely constitutes the tourism sector is poorly understood. In many cases tourism is just regarded as a service sector while some of its constituents may be found in other sectors (Akundi, 2003, Stynes and Sun, 2003).

Discussions in chapters two demonstrated that due to its powerful linkages, tourism was connected to other sectors in a direct or indirect way. Despite the difficulties related to tourism data in LDCs, it is relevant to undertake a tourism economic impacts study to inform on the usefulness of the tourism sector for developing economies and to contribute to the few studies available on tourism in LDCs. Given the complexity of the tourism sector, especially regarding the data gap in Rwanda, it was important to find an approach that could provide as much information as necessary to measure tourism income and employment accurately in Rwanda. It is for this that mixed methods, involving both qualitative and quantitative approaches, were used. The use of mixed methods is relevant to this study because it helps overcome difficulties related to tourism economic assessment in a LDC context.

As Ritchie (2003:38) explains, “Each of the two research approaches provides a distinctive kind of evidence, and used together, they can offer a powerful resource to inform and illuminate policy or practice.” In this regard, information collected using a qualitative approach served to supplement information gathered by applying quantitative methods. This was done mainly by consulting official documents and reports on Rwandan tourism and economy in general to better understand and appreciate the place given to tourism in Rwandan economy. The quantitative method involves a survey approach and the use of an economic model to estimate income and employment multipliers in tourism. This quantitative approach helped to quantify the usefulness of tourism in Rwanda in terms of income generated and employment created

## **3.2. Survey approach**

### **3.2.1. Study design**

The study design used in this research was a retrospective quantitative survey design Meyers et al (2004). The reason for this was that the nature of information needed from tourism workers and business establishments was related to past year 2015 that could provide reliable data (given a recent year) and coincides as well with the I-O table constructed. In other tourism economic impact assessment studies; data is normally obtainable from national accounts and only models could be applied to estimate the tourism impacts for a chosen year. However, in this case, given the non-existence of such data, a retrospective approach Meyers et al (2004) was used to obtain information related to a past year. Therefore, data was collected over a period of less than one-year (the second half of 2015) for workers in tourism business establishments and for one year (2015) for owners of tourism business establishments.

The purpose of the survey in this study is important and allows for the generalization from a sample to a population. The survey design presents advantages such as economy of the design and the rapid turnaround in data collection (Creswell, 2003). Self-administered questionnaires were used in this study. The questionnaires for workers instructed them to only report on income related to the second half of the year 2015. On the other side, owners of tourism business establishments were asked to provide income related to the second half of 2015 as well as for the whole of 2015. In order to obtain consistent information, all respondents were given time to think about and remember information related to income for the previous year. The survey instrument used in this study is attached in Appendix.

### **3.2.2. Study population**

During the investigation period there were 32 tourism business establishments located in Kigali city. These tourism business establishments were registered in the office Rwanda Development Board (RDB) before 2015. Of the 32 tourism business establishments, 22 were composed of hotels and guest houses while 10 were constituted by tour operators. Of the 22 hotels and guest houses, only 6 were purposively considered in this study because they mainly served tourists and conformed to international standards. The quality of a hotel is based on the five levels of rating known as “stars”, ranging from one to five Stars. In this sense, a high-quality rating star goes with a higher quality of services and physical facilities offered.

According to Karen (2006), a number of criteria are taken into account to assess the quality of a hotel. These include among others, intrinsic quality, condition, physical and personal comfort, attention to detail, guests’ choice and ease, and presentation. In assessing the quality of hotels, a certain score in terms of quality is required and the following scores represent the different star levels (Karen, 2006):

One star: 30 – 46 %

Two stars: 47 – 54%

Three stars: 55 – 69%

Four stars: 70 – 84%

Five stars: 85 – 100%.

All the hotels considered in this study rated three stars and above. Furthermore, and most importantly, the choice was driven by the kind of information expected from these tourism establishments (income and employment patterns). Each of these hotels has at least 100 workers, which gave a total parent population of 600 workers in all 6 hotels from which to draw the sample study. The choice of hotels was motivated by the fact that a large portion of tourist expenditure takes place in hotels (accommodation, transport, food and beverages), and, therefore, more impacts were expected from these hotels than elsewhere. Hotels constitute a major proxy for tourism industry impact in this case. This is also in line with studies from literature discussed in previous chapters (Aguayo et al., 2003; Turpie et al., 2004).

### **3.2.3. Sampling techniques**

The sampling technique used in this study was a single-stage sampling. According to Creswell, (2003), a single-stage sampling procedure is where the researcher has the name of people in the population from which to draw the sample and directly proceeds with sampling. This procedure is opposed to the multi-stage sampling also known as clustering. This procedure is best in cases where it is impossible or impractical to bring together a list of all elements that compose the population (Babbie, 2001).

To know the extent to which tourism contributes to people's wealth and its impact on Rwandan economy, a research survey was conducted among workers of hotels in Rwanda and tourism business owners. Given the limited time for the research and financial constraints, all the 600 workers in the tourism hotels could not be surveyed. Another reason for this was that with a well-designed sample that ensure representativity, results are expected to be reliable and could therefore be generalized to the parent population. The sampling was carried out in 2-step sampling procedure. For this, a population sample was chosen and the following sampling techniques were used.

#### **3.2.3.1. Purposeful sampling**

A purposive sample is a non-probability sample that is selected based on characteristics of a population and the objective of the study. Purposive sampling is also known as judgmental, selective or subjective sampling (Patton, 1990).

#### **3.2.3.2. Stratified random sampling**

In probability sampling, Welman and Krugger (1999) assert that random sampling is the most attractive and most used technique. There are two different random sampling techniques, namely simple random sampling and stratified random sampling Cochran, W.G (1977). In the present study a stratified random sampling was used because of the richness of the approach. The sample has been divided into strata so that the variables, such as income utilization among the different groups, could be compared. This comparison could not be possible in using a simple random sampling approach where there is a possibility of choosing individuals from one stratum. According to Strydom and Venter (2002: 205)

“stratification consists of the universe being divided into a number of strata that are mutually exclusive and the members of which are homogeneous with regard to some characteristics, such as professions, origins, places of residence”. Depending on the objectives of the study, the division into groups may be based on a single variable such as position (Cochran, 1977; Strydom and Venter, 2002).

It may also engage a combination of more variables such as age and position, age and sex and position, etc. Each group constitutes a stratum. In this study workers in hotels were grouped into three exclusive categories based on their position in the workplace. The three strata are low, middle and high level positions of hotel workers. It follows that members of each stratum presents similarities based on the variable considered rather than the population at large. The use of stratified random sampling presents 2 advantages (Strydom and Venter, 2002): Firstly, in a random sample that is stratified based on a particular variable such as position, the probability of having a sample of members of one position only is zero. Secondly, in the stratified random sampling technique, a smaller sample which requires less money and time is used. This is unlikely to happen in simple random sampling technique where large samples are required to ensure representativeness.

Welman and Kruger (1999) find out that representativeness in stratified random sampling is ensured irrespective of the sample size. This is because the sample has been constituted in a way that assures the representativeness right from the start. In this study, from 600 workers in the 6 hotels under study, a randomly selected sample of 180 workers occurred within the selected strata. The constitution of the strata was based on the position occupied at work because of the similarities the strata presented as regards variables, such as income.

Therefore, a random order determined using the random number generator was used to select 30 workers in each hotel composed of 3 strata: 5 workers in high position, 10 workers in middle position and 15 workers in low position. The number of workers in a particular position in each stratum was in proportion to the number of workers for that position in the total number of workers (parent population). For instance, if low level workers represented 50% of total workers, then 50% of low-level workers would be considered in each stratum. However, the sample would be randomly selected. Therefore, a total number of 180 workers were expected to participate in this study with 90 workers in low position, 60 and 30 workers in middle and high position respectively. However, only a total number of 167 workers from the 6 hotels responded in the present study, which represents a response rate of 92.7%.

For this sampling technique, a list of fulltime contracts per hotel for the last season of 2015 was provided by the director of human resources in each hotel. The number generated for each hotel (with n=30) corresponded with the number of the workers from each hotel to be considered in this study, this allowed for a sample of approximately 180 workers from six

hotels. This technique ensured an optimal chance of drawing a sample that was representative of the population from which it was drawn (De Vos, 2001).

In addition to the above sample, tourism business owners or top managers of all the 6 hotels were included in the sample study. The rationale for including tourism business owners was to supplement and verify the information collected from workers as well as to gather information related to tourism business. It also served as a crude check on the quality of information gathered from workers.

#### **3.2.4. Preliminary testing of questionnaire through a pilot study**

A standard procedure in sampling surveys is to conduct a preliminary test of the survey instruments for quality and clarity (Creswell, 2003). To assess whether participants in the study were able to understand the questions asked with ease, two pilot studies were carried out. These pilot studies also helped to estimate how much time was needed to complete the questionnaires. The first pilot study was conducted on six workers conveniently selected from different hotels and the second pilot study was carried out on two tourism business representatives.

A few participants from hotel workers were considered for pilot studies due to time constraints and a few tourism business representatives due to the low number of top managers available during the pilot study. The subjects considered in the pilot study were automatically excluded from the main survey in order to avoid biased responses. In conducting the pilot study; some difficulties were encountered by respondents. These were related to the way questions were asked. For instance, the sub question 3.5 addressed to tourism business owners (see Appendix A) was formulated in a different way from others. While all the questions were related to tourism business establishments, question 3.5 was formulated in a way that deals directly with the respondent and could create confusion between the tourism business and its owner.

To address the issue the question was removed for subsequent respondents to avoid confusion between the business establishment and the individual owner. During the pilot study it was also realized that sub-question 2.1, addressed to tourism business owners (Appendix A), was formulated in such a way that it could provide biased information. This was due to the fact that the amount of income sale proposed to each business establishment was far too little that it could be realized at any quarter time of the year. This was revised and adjusted to get more accurate information. The same goes for the questionnaire addressed to workers, particularly the sub-question 3.1 (Appendix B) related to the monthly

salary earned. This sub- question was revised according to the reality on the ground. The time it took for a respondent to complete the questionnaire was about 20 minutes.

### **3.2.5. Questionnaire administration and enumerators**

The data collection was done from the beginning of January 2017 up to the end of March 2017 while the pilot study was conducted in the second half of December 2016.

#### **3.2.5.1. Tools**

To collect data for this study, self-administered questionnaires were used. The close-ended questionnaires were the main tool used to collect data from both workers and tourism business owners. Furthermore, secondary data were collected from different ministries and departments in Rwanda to supplement the information gathered via the questionnaire route. With regard to the close-ended questionnaire, questions were pre-established and response categories predetermined in the form of spreadsheets on which data had to be recorded.

The questionnaire addressed to hotel workers comprised 3 parts. Part 1 was constructed with the intent to receive demographic information for the identification of the worker such as age, gender, marital status, education level and nationality. Part 2 was constructed to gather information regarding employment while part 3 was reserved to income information. In a similar manner the questionnaire addressed to tourism business owners comprised three parts. The first part deals with identification of the business, including the main activity, tourism business certificate or registration, the period of business commencement and the nationality of the owner. Parts 2 and 3 gather information on income sales and employment respectively.

#### **3.2.5.2. Translation**

Prior to the fieldwork the questionnaires used for this study had to be translated into Kinyarwanda (language spoken by most workers). The questionnaires for workers initially constructed in English were translated into French (Appendix F) and into Kinyarwanda (Appendix G) to allow for full understanding for all respondents. These three languages are the officially-spoken languages in Rwanda. To make sure that the translation was correctly done, two translators were asked to do the translations from English into the above-mentioned languages and two other different translators translated them back into English. Two translators for English and French languages were used. One translated the questionnaire from English into French, and another from French into English. Similarly, two translators were used for English and Kinyarwanda languages. One translated from English into Kinyarwanda and another from Kinyarwanda into English. The same translators that translated the workers' questionnaire translated the questionnaire addressed

to tourism business owners. However, this was only translated from English into French (Appendix E) and back into English. The rationale was that all business owners were supposed to have an understanding of either language (English or French) as the main academic languages in Rwanda but also as a mode of communication used with tourists and other business partners.

### **3.2.5.3. Procedure**

To begin with, respondents' appointments had to be obtained either by telephone or through physical contact, and only then questionnaires could be distributed. The pilot study showed an approximate time of 20 minutes to complete the questionnaire, although more time was given to respondents when needed. For the sake of reliability questionnaires were delivered to respondents and collected a few days afterwards to allow them to recall information related to the previous year. Although this approach does not provide 100% guarantee in some cases in the understanding and the responding to the questionnaire since respondents are left by their own, the pilot study was conducted to ensure a clear understanding of the questionnaire.

The pilot study was intended to test the clarity of the questionnaire, and adjustments were made where necessary to make the questionnaire self-explanatory. Tourism business owners took some time to return the questionnaires addressed to them because of their multiple responsibilities. However, questionnaires distributed to workers did not cause any problem except for a few respondents who did not return them.

### **3.2.5.4. Data analysis**

The data from workers and that from tourism business establishments were analyzed separately. A statistical analysis was used where necessary for both questionnaires. Descriptive statistics, frequencies, means, standard deviation, maximum, and minimum of the variables measured in the questionnaire to workers in hotels, are displayed. The results obtained are displayed by means of tables, histograms and line charts. In addition to the survey approach, this study has relied on the use of input-output model to estimate the income and employment multipliers of tourism.

## **3.3. Input output Model**

To determine the size of tourism income and employment multipliers, the study applied I-O model. The model has been used to assess the direct, indirect and induced effects of tourism on income and employment in Rwanda. In the chapter two on tourism income and employment multipliers, different approaches used to determine the above variables were discussed. Each method presented strengths and weaknesses. However, given the appropriateness of the I-O model for this study, the model was to be used in this study.

### **3.3.1. Input-Output model for Rwanda**

Input-output analysis is a “Matrix algebraic technique” designed to study the interdependence of the production and consumption sectors in a modern economy. It shows interlinkages that exist within sectors by displaying sectors that purchase goods and services from other sectors and which in turn produce goods and services which are sold to other sectors (O’Connor and Henry, 1975).

To conduct such a study, an input-output table is needed where various economic flows are set to provide information on all economic activities within a state or region. In many developing countries I-O tables do not exist because of the high cost involved in constructing them. It is also the case for the Rwandan economy. In the absence of I-O tables for the Rwandan economy and given the importance of this study, it was necessary to construct an adapted I-O table (as used by Yusaku, 2002) that could provide information regarding tourism income and employment multiplier effects. However, given the limited time for this research and the cost for obtaining data to construct a complete I-O table which could be ideal, only 3 major sectors in close relationship with the tourism industry were taken into consideration. These sectors are: tourism (hotels, crafts, tourism resorts and any other activities attached directly to tourism), agriculture, forestry and fishing and transport (including fuel and other related services). To construct I-O tables for these three particular sectors, data was obtained from department of statistics in the Ministry of Finance and Economic Planning, the Rwanda Revenue Authority, the Rwanda Office of Tourism and National Parks and the National Bank of Rwanda.

The data collected was related to the year 2015 because in I-O analysis, results obtained reflect the situation at a particular time, usually one year. The rationale for choosing the year 2015 is that it matches with the methodological approach used in conducting the survey for the reasons mentioned previously in this chapter. Furthermore, information is expected to be consistent given that records for this recent year are still obtainable. The I-O table for the above chosen sectors for Rwanda in the year 2015 is schematically presented as follows: 1 = Tourism; 2 = Agriculture, Forestry and Fishing; 3 = Transport; This table draws from the work of Wassily Leontief (1930).

**Table 3.1 Input Output Table for 3 sectors in Rwanda in 2015**

Outputs Inputs	1	2	3	Final Demand	Total Outputs
1	$Z_{11}$	$Z_{12}$	$Z_{13}$	$f_1$	$q_1$
2	$Z_{21}$	$Z_{22}$	$Z_{23}$	$f_2$	$q_2$
3	$Z_{31}$	$Z_{32}$	$Z_{33}$	$f_3$	$q_3$
Total inputs	$\sum_{ij=1}^3 Z_{ij}$	$\sum_{ij=1}^3 Z_{ij}$	$\sum_{ij=1}^3 Z_{ij}$	$\sum_{i=1}^3 f_i$	$\sum_{i=1}^3 q_i$

We denote total output of each sector  $i$  by  $q_i$ , which is the quantity of output sold to the other sector  $j$ , called inter-industry transactions (represented as  $Z_{ij}$ ), and to final demand sector denoted as  $f$ .

With  $i, j = 1... 3$ , The above I-O table can be translated into equations to measure the size of income and employment multipliers. The composition (in income) of  $q_i$  can simply be expressed in the following format:

$$q_i = Z_{i1} + Z_{i2} + Z_{i3} + f_i \quad (1)$$

By extending equation (1) to (3) sector economy for the case of this study, we obtain:

$$\begin{aligned} q_1 &= Z_{11} + Z_{12} + Z_{13} + f_1 \\ q_2 &= Z_{21} + Z_{22} + Z_{23} + f_2 \\ q_3 &= Z_{31} + Z_{32} + Z_{33} + f_3 \end{aligned} \quad (2)$$

By assumption,  $Z_{ij}$  is a unique linear function of  $q_j$ :

$$a_{ij} = \frac{z_{ij}}{q_j} \quad (3)$$

The rational number  $a_{ij}$  is called the technical or input-output coefficient. When computed for all sectors in the inter-industry transactions, a **3** by **3** matrix of technical coefficients is obtained and can be schematically presented as:

$$A = \begin{bmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{bmatrix}$$

Each element of A ( $a_{ij}$ ) stands for the direct input required for sector  $i$  per unit of final demand for the output of sector  $j$ .

By reformulating (A) in equation (3) we obtain in matrix form:

$$q = Aq + f \quad (4)$$

Where  $q$  and  $f$  are (**3** by **1**) vectors of total output and final demands respectively. By rearranging equation (4), we obtain:

$$f = [I - A]q \quad (5)$$

With  $I$  being the identity matrix

If we assume that an inverse of  $[I - A]$  exists, then equation (5) can be rewritten as:

$$[I - A]^{-1}[I - A]q = [I - A]^{-1}f \quad (6)$$

$$\text{Thus } q = [I - A]^{-1}f \quad (7)$$

Equation (7) is the standard I-O model used for multiplier analysis, where  $[I - A]^{-1}$  is the familiar Leontief inverse. It represents the mechanism through which  $f$  is transformed to  $q$  (assuming the existence of at least one non-zero element in  $f$ ). This mechanism underlies the multiplier theory as Akundi (2003) confirms.

### 3.3.2. Rationale for the choice of input-output model

The rationale for using the I-O model in this study is driven by the fact that the model details the direct, indirect and induced effects of tourism on income and employment. One of the objectives of this study was to determine the size of income and employment multipliers and to determine the total effects (direct, indirect and induced).

Another objective of this study was to show to what extent tourism contributes to Rwandan economy. This could only be achieved if an estimation of the tourism impact could be provided. Additionally, the study attempts to determine how much income and employment would be generated as a result of initial injection of income in tourism. The I-O approach is the only method for this case that could help to answer these research questions and objectives. The use of I-O model was also motivated by the fact that it could be used to predict changes in overall economic activity as a result of some change (endogenous and/or exogenous) in the tourism sector. This calls for policy consideration as it gives an image of how the sector can perform, and therefore allows policymakers to take actions accordingly.

### **3.3.3. Difficulties encountered in constructing input-output tables**

During the data collection period many difficulties were encountered in the field. The most crucial problem was to obtain data on tourism. In Rwandan national accounts tourism does not exist as a separate sector. It is placed under the service sector but at the same time, other tourism-related activities could be found in sectors such as wholesale trade, and retail and these did not account for tourism. It follows that using data from the service sector could only give a partial representation of the tourism sector in Rwanda, given that the decomposition of tourism sector is difficult. Given the above, information used in this study as regards I-O analysis, results obtained should serve only as an indication of tourism performance in Rwanda.

Another equally important problem in this study was the lack of I-O tables for Rwandan economy. To overcome this gap an adapted I-O table was constructed to serve for this research (Yusaku, 2002). Data were obtained from different departments in various places. This was time and energy consuming but also costly. Because the information needed was related to a particular year (2015), it took time to scrutinize the information and to record what belonged to that year.

## **CHAPTER FOUR: PRESENTATION OF RESULTS AND INTERPRETATION OF THE FINDINGS**

### **4.1. Introduction**

In earlier chapters of this study we have established the actual and potential contribution of tourism to economic growth and development in developing countries. Evidence cited from a number of least-developed countries, especially small island-developing states, show that the tourism sector adds significantly to GDP and employment growth. Most studies further predict that the contribution of this sector is set to expand in future.

This chapter applies the conceptual framework and propositions derived in the previous chapters to the Rwandan data. A descriptive overview of the brief purposive survey data is presented first. The data from the survey supplemented with additional data collected on Rwandan economy allow us to simulate the income and employment effects of the sector, using a rough input-output framework for Rwanda. Employment and income multipliers derived in this chapter help us to estimate the increases in employment and income under different tourism growth scenarios. The remainder of this chapter is organized as follows: In section 2 primary results from workers are presented and the findings interpreted. In section 3 findings from tourism business establishments are presented and discussed. In section 4 the income and employment multipliers of tourism in Rwanda are estimated. The last section concludes the chapter.

### **4.2. Demographic characteristics and employment patterns of the labor force**

Demographic data regarding the labor force considered in this study is presented in the table below. Three main variables, namely age, gender and working experience, are interlinked and discussed as these indicate demographic characteristics of the labor force. The findings in table below indicate that the labor force involved in this study was aged between 16 and 50 years old. A large number of respondents (90) were between 26 and 35 years old. The economic significance of this variable age is that the large number of respondents is in accordance with the working age, defined by the International Labor Organization (ILO) of between 15 to 65 years.

Employing people who are economically active is expected to lead to the productivity of the tourism sector. This is reflected in the performance of hotels (our sample study) as displayed further on in this chapter. Considering that the tourism industry is essentially a service sector, the more dynamic the workers are, the more demand there is for tourism service.

Linking the variable age to gender, findings reveal that male workers dominated the labor force in the case study. The majority of the male labor force (71) was also aged between 26 and 35 years, while on average the majority of female workers were much younger than their male counterparts. It was reported that 26 out of the 50 female respondents were aged between 16 and 25 years old, while 19 were between 26 and 35 and only five between 36 and 50 years. Considering the overall respondents, findings reveal that female respondents represented only 30% of the labor force considered for this study.

This gender imbalance is not peculiar to this case study; it is also the case in many work places given the low number of educated women in Rwanda as seen in chapter two of this thesis. The low education of Rwandan girls is partly due to past cultural perceptions of a girl's place being at home. This is a hindrance for the development of any economic sector, especially in Rwanda where the female population outnumbers the male population (52.3% against 47.7% as per the 2012 Rwanda general census of population and habitat) (MINECOFIN, 2013). Although female workers are still underrepresented in the work place, efforts are being made by the government to eradicate this gender imbalance and to promote female education and employment. The working experience of the respondents varied between 1 and 20 years.

The majority of workers had between 6 to 10 years of experience with a frequency of 140 respondents representing 84%. The long working experience in the same industry can be seen either as a sign of work satisfaction or a lack of choice where an employee has to remain in her or his work place. However, regarding the case of the tourism industry represented here by hotels, it was revealed that the income earned in this industry is satisfying. This was reported by some of our respondents during the survey. It is also confirmed by the responses gathered as reflected in Table 4.2 on income patterns.

Linking the work experience to the variable age, findings reveal that younger workers have less experience than older people. However, the proportion of long-working experienced workers decreases as mature workers get older and retire, and increases as younger workers mature. 3% of respondents reported a working experience of between 1 and 5 and were aged between 16 and 25 years old. The long-working experienced people had between 11 and 20 years and were aged 36 to 50 years. They represented 13% of the overall working forces considered in this study.

**Table 4.1: Employment patterns: Age, Gender and Work experience**

Age	Number of respondents	Gender		Work Experience (in years)	Number of respondents	%
		Male	Female			
16 – 25	40	14	26	1 – 5	5	3
26 – 35	90	71	19	6 – 10	140	84
36 – 50	37	32	5	11 - 20	22	13
Total	167	117	50		167	100

In addition to the three main variables discussed above, this study also investigated the marital status and number of dependents in a household to explore the impact of income and employment on the labor force. As regards the marital status of the respondents, the majority (61%) revealed that they were married while 27 % were single and 12% widowed. This informs on the stability of workers in a work place as personal observation has proved that married people are more stable than single ones. If this is in fact the case, workers are expected to be more productive as a result of long working experience.

This study reveals that the average number of people dependant on the income of one person, or the breadwinner, was 9 (with a mean of 8.66 and a standard deviation of 2.74). In Rwanda the 1994 genocide had many socioeconomic consequences such as the many orphans, widows and other vulnerable family members who were left without income. Consequently, it is difficult to find a nuclear family without extended family members or orphans who depend on the household's income. The results of this research have confirmed that more than 50% of the respondents had at least 7 dependants at the time of the survey. They show that 39% of respondents had between 7 and 9 dependants, 28% between 10 and 12 dependants while 9% had more than 12 dependants.

The fact of having many dependants also influences the wage earner to remain in a particular job for a long time in order to secure the job and to sustain the household's livelihood. The presence of this tourism business to employees means a lot to them as it helps them support their families. In this study income and employment are used to illustrate the extent to which tourism contributes to the economic wealth of people. In the next section, therefore, income patterns for workers considered for this case are discussed.

#### **4.2.3. Income patterns for workers in the tourism sector**

This study has set out to investigate the extent to which tourism contributes to income and employment. In the above section, employment patterns have been explored. In this section and in Table 4.2 below, income patterns are discussed. They inform about the education level of the labor force in the tourism-related industry, the position of status occupied as well as the income earned in these tourism business establishments.

In analyzing the education levels of people, the position occupied by the labor force and the income earned, it has been found that there is a positive correlation between the three variables. The more educated people occupy high positions and earn more income than the rest. This is consistent with human capital theory. Results from the below table indicate that the majority of workers (86%) have at least a secondary school level or tertiary level of education. Those with secondary school level represent 44% of the labor force while 42% reported having a tertiary level and only 14% have a primary school level.

This is in line with the Rwandan government agenda of promoting education at all levels. What is important to note here is that tourism accommodates all categories of labor forces, including those with a low level of education such as primary school level. It is an advantage for LDCs, and that of Rwanda, to benefit from such a sector that can absorb even a low skilled labor force which forms the majority of workers in most developing countries. As regards the incomes earned by workers in general, they varied from less than RWF 150,000 up to RWF 900,000. The majority of workers earned an income between RWF 151,000 to 300,000.

This range coincides with the medium income level in Rwanda and corresponds with the medium level of education (secondary school level) which accounts for the majority of respondents as well. If seen against the poverty index in Rwanda, it is clear that workers in tourism business establishments fit into a level that is far above the poverty line, fixed in 2014 at RWF 90 000 per annum and per adult equivalent (Republic of Rwanda, 2014). This is a positive impact on Rwandan poverty reduction policy since it reduces the number

of vulnerable and poor people. The income earned by these workers allows them to fulfill their various responsibilities such as their households' consumptions, taxes and other households' needs such as education for their children.

**Table 4.2. Income patterns: Education level, position occupied and income earned by workers**

Education level	%	Position	Income in thousand of RWF
Primary	14	Low	1 – 150
Secondary	44	Middle	151 – 300
Tertiary	42	High	301 – 900

The impact of tourism on Rwandan economy also needs to be assessed against beneficiaries of income and employment. In this regard the nationality of the respondents was taken into consideration and the vast majority of them (94%) reported being Rwandese. The significance of this with regard to income and employment effects is that if 94% of Rwandese are employed and earn an income, there is a high likelihood that they spend their income on local markets, impacting positively on the local economy and paying for taxes which increase the government's revenues. On the contrary, as suggested in literature on income and employment effects discussed in previous chapters, if the tourism sector employs more foreigners, income generated goes out to their countries of origin, leaving little impact on the local economy. This was referred to as tourism leakages.

Furthermore, it is important to investigate how the income earned from the tourism-related services is used. This information is important in this study because it allows us to understand the backward and forward linkages attached to the tourism-related sector. In the next table, income utilization is presented for analysis. The findings in Table 4.3 below on income utilization reveal that three main items made up the income earned by surveyed workers, namely, household consumption, taxes and savings.

The share in these variables differs significantly depending on the size of the household and the level of income. Findings in Table 4.3 indicate that the majority of workers (61%) spent between 26 and 50 % of their income on household consumption. 36% of respondents reported spending between 51 and 75%. The remaining workers, i.e. 2% and 1%, revealed spending respectively between 1 – 25 % and 76 – 100% of their income on their household consumption.

The households' capacity to purchase goods and services for consumption can be regarded as a stimulus to economic activities, especially those sectors dealing with the demands of households. Household consumption allows for money circulation, and thus creating a multiplier effect over the whole economy provided that goods and services consumed are produced locally. This is associated with the powerful intersectional linkages that characterize the tourism sector as explained in the literature in previous chapters.

It is important to mention that as people spend on household consumption, they indirectly pay taxes as final consumers. But this was not reported in the survey because it is an indirect tax where a taxpayer, especially the final consumer, has little knowledge of the tax involved. And as far as the multiplier effect is concerned, those who benefit from the income of households consumption pay taxes indirectly to the Rwanda Revenue Authority (RRA). The income received by RRA helps the government achieve its many goals, amongst others, its development objectives. This sample study reflects the fact that indicates that only a small portion of workers' income was allocated to savings. According to findings, 85% of workers revealed that only 1 to 25% of their income was directed towards savings. Again, this is understandable in the sense that many workers are unable to save because of the many dependants who they have to provide for.

**Table4.3. Workers' income utilization (%)**

<b>Variables</b>	<b>1 - 25</b>	<b>26 - 50</b>	<b>51 - 75</b>	<b>76 - 100</b>	<b>Total</b>
Proportion of household Income spent on consumption	2	61	36	1	<b>100</b>
Proportion of household income spent on taxes	79	21	0	0	<b>100</b>
Proportion of household income spent on savings	85	14	1	0	<b>100</b>

It was seen in this section that hotels in Rwanda employed many people of different ages and different levels of education. The kinds of jobs performed by the labor force differed from one worker to another depending on their education level. Likewise, the income distributed to a worker was positively related to the worker's level of education and the position occupied. The benefits of tourism are not limited to the labor force employed in the tourism business establishment but are also spread to other economic sectors, including the service provider. In the next section results from tourism related business establishments are shown and the discussion of the findings presented.

### **4.3. Presentation and discussion of the findings from tourism-related business establishments**

#### **4.3.1. Response rate**

Until now, we have focused on a descriptive analysis of the purposive survey data. We have discussed income and employment patterns of the labor force in the tourism-related businesses. In addition to income and employment generated by tourism to individual workers in hotels, owners of tourism business establishments were also beneficiaries of the sector. In that sense, therefore, we have addressed a questionnaire to the tourism-related business owners to gather information on their businesses. All hotels involved in this study responded to the questionnaire regarding tourism business establishments, (Appendix C), representing a 100% response rate.

#### **4.3.2. Identification of business establishments: demographic data**

In addition to secondary data analyzed to discuss the tourism sector in Rwanda, a survey was conducted exclusively on hotels as tourism business establishments and their impact on the rest of the local economy. In this regard only hotels with an international standard were considered. The reason for this, as explained in the methodology chapter, is that tourists spend a large amount of their money in hotels (board and lodging). Therefore hotels were expected to have more impact on other economic sectors than other tourism business establishments.

All hotels considered in this study were officially registered as tourism business establishments. Of these tourism establishments, 67% started their business after the 1994 genocide while 33% of them were operational before the war and genocide (Table 4.4). This shows that Rwanda has become a safer place to invest after the devastating disaster of 1994. As the country stabilized more people were encouraged to invest in Rwanda and this is expected to benefit, not only investors, but also the country in general given, the multiplier effects of tourism. Looking at the ownership of these surveyed tourism establishments, the vast majority (67%) were owned by Rwandese while 33% of them

belonged to foreign investors. The fact that the majority of these tourism business establishments were owned by Rwandese ought to have had a positive impact on local economy in that the profits made from the business were likely to be spent locally rather than being sent out as dividends or profits to the owner and spent overseas. However, one has to state that this data concerns the surveyed tourism businesses and cannot be generalized to the whole tourism sector in Rwanda in terms of the benefit of ownership to the country.

**Table 4.4. Identification of tourism business establishments**

<b>Tourism business registration</b>	<b>%</b>	<b>Commencement of activity</b>	<b>%</b>	<b>Nationality of owner</b>	<b>%</b>
Yes	100	Before 1994	33	Rwandese	67
No	0	After 1994	67	Other	33
Total	All businesses were registered		100		100

In the next section employment patterns for these tourism related business establishments are presented and discussed.

#### **4.3.3. Employment patterns for tourism business establishments**

Table 4.5 below indicates that 67% of the labor force is Rwandese while only 33% represented other people of non-Rwandan nationality. Concerning working positions, three different levels were considered in this study: these were low position, middle position and high position as mentioned earlier. Considering the positions occupied by Rwandese workers, results in Table 4.5 indicate that 100% of workers in both low and middle positions were Rwandese, while in managerial positions only 67% of Rwandese were represented. This is explained by the fact that non-Rwandan experts work mainly at the managerial level, given their professionalism and experience regarding the tourism business.

**Table 4.5. Employment patterns: number of workers, proportion of Rwandese, and their position**

Nationality of workers	Number	%	Position (%)		
			Low	Middle	High
Rwandans	134	67	100	100	67
Other	66	33	0	0	100

In the next section, income patterns in these tourism business establishments are presented and discussed

#### **4.3.4. Income generated by tourism business establishments and its utilization**

##### **4.3.4.1. Income generated**

Income and employment multiplier effects of tourism would not exist if there was no income and employment generated by tourism business establishments. For the purpose of this study the investigation was based on the year 2015 as to enable tourism establishments to remember the income generated. This would mean more accurate data on this economic variable. Four quarters in the year were considered and as seen in Table 4.6 below, the income generated fluctuated across all the quarters of the year 2015.

In the first quarter of the year 2015 (Table 4.6), 33% of tourism business establishments indicated that they had realized a quarterly income ranging from 1000,001 to 2,000,000 RWF (US\$ 2000 to 4000), 17% reported an income ranging from RwF 2,000,001 to 3,000,000 (US\$ 4000 to 6000), 33% realized an income varying from RwF 3,000,001 to 4,000,000 (US\$ 6000 to 8000) and 17% indicated that their income ranged between RwF 4,000,001 and 5,000,000 (US\$ 8,000 to 1,000,000). In the second quarter these proportions changed, moving from 33% in the first quarter to 17% for the range of income between RwF 1,000,001 to 2,000,000; from 17% to 0% for the range of income between RwF 2,000,001 to 3,000,000; and increased up to 50% for the higher range of income between RwF 3,000,001 to 4,000,000.

This proportion dropped to 33% for the range of income of RwF 4,000,001 to 5,000,000 but still remained high when compared to that of the first quarter. The third and fourth quarters of the year 2015 saw an increase in the proportion of establishments with a high-income range. 66 % of tourism business establishments reported an income range of RwF 3,000,001

to 4,000,000 for both quarters while 17% of them reported even a higher range of income between RwF 4,000,001 to 5,000,000 in the last quarter of the year.

In the table below, it can be observed that the income realized by tourism establishments fluctuates over the different periods of the year. The income realized in the first quarter was moderate and increased in the following quarter reaching the high-income level towards the end of the year. The fact of realizing a high income towards the end of the year is partly explained by the tendency of people to spend more money during that period as a result of their vacation period where they have more time to relax and enjoy the fruits of their hard work.

**Table 4.6. Quarterly income generated in 2015 (in Thousands of RWF)**

<b>Gross income</b>	<b>1<sup>st</sup> Quarter (%)</b>	<b>2<sup>nd</sup> Quarter (%)</b>	<b>3<sup>rd</sup> Quarter (%)</b>	<b>4<sup>th</sup> Quarter (%)</b>
< 1000	0	0	0	0
1001-2000	33	17	17	0
2001-3000	17	0	17	17
3001-4000	33	50	66	66
4001-5000	17	33	0	17
> 5000	0	0	0	0

#### **4.3.4.2. Income utilization**

As mentioned earlier, it is through the multiplier effect that tourism benefits are spread into other economic sectors. In that sense we argue that the way tourism-related businesses utilize their income determines the impacts they have on other sectors. The table below displays the different categories on which the income generated in tourism-related sectors is spent. With regard to the income utilization, 67% of tourism business establishments reported spending between 1 to 25% of their income on imports of inputs. For this same

variable 23% and 10% of tourism business establishments reported using between 26 and 50% and 51 and 75% respectively of their income to import inputs for their production.

As it is illustrated in the table below, the majority of respondents (67%) used less than 25% to import inputs. This is beneficial for a country where the business is located. If progressively fewer inputs are imported, this means that the propensity to utilize local inputs is high. This is confirmed by the figures given for the income spent on purchasing inputs from local markets. It is revealed by 67% of respondents that 51 to 75% of their income was used towards acquiring inputs from local markets. 23% of respondents revealed that they used 26 to 50% of their income to buy local inputs while only 10% allocated 1 to 25% of their income for the same purpose.

If tourism business establishments are able to use local inputs which satisfy tourist demands, this means that the local market is capable of offering quality products. As far as multiplier effects are concerned, the income spent on local products helps boosting local producers businesses and stimulates them to increase their production. The more these local tourism business people benefit, the more income spreads throughout the Rwandan economy as induced effects. However, it is important to mention that in this study only the operational phase was considered, while the construction phase was not. The latter was not in the scope of this study since we looked at the performance of these businesses in a particular year when they were functioning.

More import-leakages are observed at the construction phase than during the operational phase. This is mainly a result of importing necessary raw materials and other industrial inputs necessary to put in place infrastructure for tourism businesses such as hotels. Looking at savings patterns, findings presented in Table 4.7 illustrate that 83% of tourism business establishments allocated 1 to 25% of their income to savings, while 17% of those establishments indicated that they had saved between 26 and 50% of their income. The savings reflected in these establishments are not impressive but, although small, these savings contribute to replenishing investments stock of those tourism business establishments. Income was also utilized towards the payment of taxes and wages. As regards tax payment, 63% of the sample study indicated that an income ranging from 1 to 25% was allocated to taxes, while 37% of respondents revealed that 26 to 50% of their income was devoted to paying taxes.

Note that taxes reported here are in direct connection with the tourism business establishments' turnover and do not include taxes related to workers' wages and salaries. Considering aggregate wages findings reveal that the majority of the respondents (50%) used between 51 and 75 % of their income to paying salaries of their workers. 33% and 17% of respondents in the sample study reported spending respectively between 26 and 50% and between 1 and 25% of their overall income for wages. As explained earlier, an income injected into a society has multiple effects on the local economy.

**Table 4.7. Gross income utilization in tourism business establishments**

<b>Variable measured in %</b>	<b>Import of inputs</b>	<b>Inputs from local market</b>	<b>savings</b>	<b>Taxes</b>	<b>Wages</b>
<b>Percentage range</b>					
<b>1-25</b>	<b>67</b>	<b>10</b>	<b>83</b>	<b>63</b>	<b>17</b>
<b>26-50</b>	<b>23</b>	<b>23</b>	<b>17</b>	<b>37</b>	<b>33</b>
<b>51-75</b>	<b>10</b>	<b>67</b>	<b>0</b>	<b>0</b>	<b>50</b>
<b>76-100</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

The survey used in this study dealt with the impact of tourism-related businesses on income and employment. It presented the benefits to both workers and owners of those businesses. However, to determine the total impact of tourism on Rwandan economy we have supplemented the above information with data on Rwandan economy for the year 2015 to estimate the multipliers. In the next section the size of tourism income and employment multipliers is estimated and interpreted.

#### **4.4. The size of tourism income and employment multipliers in Rwanda and their interpretation**

In the previous sections the findings from the survey were presented. It was found that tourism hotels in Rwanda employed many employees and generated incomes which have a positive impact on Rwandan economy. In this section the size of tourism income and employment multipliers in Rwanda is determined using I-O model. One of the objectives of this study was to raise awareness of the extent to which tourism contributes to economic development. Income and employment were given special attention, given the important role they play in a country such as Rwanda. In the absence of I-O tables for Rwandan economy, an adapted I-O table was constructed for use in this study.

It consists of three sectors that are closely interlinked with tourism in Rwanda. These are tourism, agriculture and transport. It is important to bear in mind that the agriculture and transport sectors used in this model are exclusively tourism-related and do not include the transactions with other economic sectors. Although the findings reflected here are tourism-related activities, they have a significant impact on the rest of the Rwandan economy. These sectors help us to assess the importance of tourism via its multiplier effects into the Rwandan economy. In what follows, the tourism income effects are estimated first, while the employment effects estimation follows.

#### 4.4.1. Tourism Income multiplier effects in Rwanda in 2015

Input output analysis underlies general equilibrium phenomena. It takes into consideration production plans and activities of many industries that compose an economy. According to Taylor (2004), each entry along a row in the table is valued at the same price and the sums of rows should be equal to the sums of columns. The equality of sums in I-O analysis is driven by macroeconomic theories (O'Connor and Henry, 1975). The interdependence of sectors comes from the fact that each industry uses outputs of other industries as raw material to produce its own outputs. Similarly, its output is used in other industries as a factor of production or raw material. In the I-O table each row shows in detail the amount of money spent in, and received from, other sectors of the economy. The table is called a 'transactions table' referring to monetary transactions of double-entry accounting. It shows the monetary flow of goods and services in a local economy for a particular year. In the present case the transactions are related to the year 2015. The following table represents income transactions table for the three selected sectors in Rwanda for the year 2015.

**Table 4.8. Income Transactions table for selected sector (in billion of RWF)**

<b>Purchasing Sectors</b>	<b>Tourism</b>	<b>Agriculture</b>	<b>Transport</b>	<b>Final demands</b>	<b>Total Output</b>
<b>Selling Sectors</b>					
<b>Tourism</b>	<b>4</b>	<b>2</b>	<b>7</b>	<b>19</b>	<b>32</b>
<b>Agriculture</b>	<b>6</b>	<b>8</b>	<b>3</b>	<b>22</b>	<b>39</b>
<b>Transport</b>	<b>5</b>	<b>3</b>	<b>8</b>	<b>36</b>	<b>52</b>
<b>Final payment</b>	<b>17</b>	<b>26</b>	<b>34</b>	<b>0</b>	<b>77</b>
<b>Total output</b>	<b>32</b>	<b>39</b>	<b>52</b>	<b>77</b>	<b>200</b>

Reading down the table the entries typically show the purchases from other sectors of goods and services required by an industry to carry on its activities. For instance, the tourism sector in Rwanda spent RWF 32 billion overall in 2015 for purchasing inputs from other sectors in order to produce its output. Specifically, the tourism industry in Rwanda spent respectively in 2015 an amount of RWF 4 billion, 6 billion and 5 billion to acquire goods and services from Tourism, Agriculture and Transport sectors. Likewise, the agriculture sector spent an income of RWF 39 billion buying inputs from other sectors while transport service used RWF 52 billion for the same reason in the same year, the final demand is 77 billion and the final payment is 77 billion as illustrated in the table. As the sectors spend income to purchase inputs, they also receive income from other sectors for selling their outputs which constitute the inputs for the purchasing sectors. In that sense the tourism sector received RWF 4 billion from tourism, 2 billion from Agriculture and 7 billion from the transport sectors. These results give us methods to translate money values into technical coefficients needed to produce a unit of final output for each industry. The direct requirements table known as technical coefficients is obtained using the following formula:

$$a_{ij} = \frac{z_{ij}}{q_j}$$

Where  $a_{ij}$  symbolizes the technical coefficient or input-output coefficient as presented in the table below of direct requirements table.  $z_{ij}$  stands for inter-industry transactions represented in the transactions table above; and  $q_j$  is the total output of each industry. The technical coefficients ( $a_{ij}$ ) for our three sectors model are presented in the matrix  $A$  below:

$$A = \begin{bmatrix} 0.125 & 0.051 & 0.135 \\ 0.188 & 0.205 & 0.057 \\ 0.156 & 0.077 & 0.154 \end{bmatrix}$$

Note that, rather than displaying actual money transactions, the direct requirements table below shows what fraction of total income was spent by a named sector at the top to purchase required inputs from the sector named at the left, to produce one unit of total output.

**Table 4.9. Income direct requirements table**

Selling sectors\Purchasing sectors	Tourism	Agriculture	Transport
Tourism	0.125	0.051	0.135
Agriculture	0.188	0.205	0.057
Transport	0.156	0.077	0.154

For this case study the table can be interpreted as follows: for tourism to produce one unit of its output it needs to spend a proportion of income of 0.125 purchasing inputs from the tourism sector, 0.188 from Agriculture and 0.156 from Transport. On the other hand, the tourism sector has to sell its output to other sectors in the following proportions: 0.125 to tourism, 0.051 to agriculture and 0.135 to transport. The same logic can be used to interpret agriculture and transport technical coefficients. This direct requirements table or technical coefficients table is at the centre of input-output analysis. The intention of this table is to create the equilibrium conditions under which sectors in a given economy have just enough output to satisfy each other's demands in addition to final outside demands (O'Connor and Henry, 1975). From the table of direct requirements the size of the multipliers for the three sectors model can be determined. The following formula is used:

$$\mathbf{q} = [\mathbf{I} - \mathbf{A}]^{-1} \mathbf{f}$$

Presented in matrix form,  $\mathbf{q}$  and  $\mathbf{f}$  are vectors of total output and final demands respectively, while  $\mathbf{A}$  is the matrix of technical coefficients (above presented) and  $\mathbf{I}$  the identity matrix. The above equation is the standard input-output model used for multiplier analyses, where  $[\mathbf{I} - \mathbf{A}]^{-1}$  is the familiar Leontief inverse. It represents the mechanism through which  $\mathbf{f}$  is transformed to  $\mathbf{q}$  (assuming the existence of at least one non-zero element in  $\mathbf{f}$ ).

The results obtained, using the above formula, are displayed in the following matrix, ( $[\mathbf{I} - \mathbf{A}]^{-1}$  also known as Leontief inverse):

$$[\mathbf{I} - \mathbf{A}]^{-1} = \begin{bmatrix} 1.199 & 0.096 & 0.198 \\ 0.301 & 1.290 & 0.135 \\ 0.249 & 0.135 & 1.231 \end{bmatrix}$$

The table below gives the total direct and indirect effects of the three sectors considered in this study. These results are type I income multipliers. Type I multipliers include direct and indirect spending, therefore giving direct and indirect effects of the studied sectors to the local economy.

**Table 4.10. Income total requirements table**

Selling sectors\Purchasing sectors	Tourism	Agriculture	Transport
Tourism	1.199	0.096	0.198
Agriculture	0.301	1.290	0.135
Transport	0.249	0.135	1.231
<b>Total</b>	<b>1.749</b>	<b>1.521</b>	<b>1.564</b>

The income multipliers obtained after calculations are: 1.749 for tourism, 1.521 for Agriculture and 1.564 for the Transport sector. Economic interpretation used here is based on the theory that for every RWF 1 income change in the tourism sector, there is a total income of RWF 1.749 generated in the study area as a result of direct and indirect linkages. When the Agriculture sector realizes a RWF 1 change in income, total income in the study area changes by RWF 1.521 from direct and indirect linkages.

And for every RWF 1 income change in the transport sector, there is a total income of RWF 1.564 generated in the study area. Comparing these multipliers for this case, it follows that the tourism income multiplier is bigger than the two interlinked sectors; this means that the effect of tourism on the rest of the economy is the biggest if these three sectors are only considered at direct and indirect impacts level. The purpose of this study was to show to what extent the tourism sector is important as regards its impact on Rwandan economy.

The above results present only direct and indirect effects of the sectors studied. It must be realized that the type I multiplier underestimates the total effects by ignoring ‘wage-earners’ (households) increased spending. Type II multipliers, on the other

hand, also include induced effects. These are obtained by including in the original table households spending based on the income earned from direct and indirect effects. To get a full range of tourism impacts, both type I and II multipliers are used in conjunction. The following table gives the transactions between the three sectors with households.

**Table 4.11. Income transactions table with households (in billion of RWF)**

<b>Purchasing Sectors</b> <b>Selling Sectors</b>	<b>Tou rism</b>	<b>Agricult ure</b>	<b>Trans port</b>	<b>House holds</b>	<b>Final demands</b>	<b>Total Output</b>
<b>Tourism</b>	<b>4</b>	<b>2</b>	<b>7</b>	<b>5</b>	<b>14</b>	<b>32</b>
<b>Agriculture</b>	<b>6</b>	<b>8</b>	<b>3</b>	<b>10</b>	<b>12</b>	<b>39</b>
<b>Transport</b>	<b>5</b>	<b>3</b>	<b>8</b>	<b>9</b>	<b>27</b>	<b>52</b>
<b>Households</b>	<b>4</b>	<b>6</b>	<b>14</b>	<b>0</b>	<b>0</b>	<b>24</b>
<b>Final payment</b>	<b>13</b>	<b>20</b>	<b>20</b>	<b>0</b>	<b>0</b>	<b>77</b>
<b>Total output</b>	<b>32</b>	<b>39</b>	<b>52</b>	<b>24</b>	<b>77</b>	<b>200</b>

Households, in this case, received RWF 4 billion, 6 billion and 14 billion respectively from tourism, agriculture and transport industries in 2015. Likewise, households spent RWF 5 billion, 10 billion and 9 billion on tourism, agriculture and transport respectively. Based on the above table, and using the formula below:

$$a_{ij} = \frac{Z_{ij}}{q_{ij}}$$

The technical coefficient  $a_{ij}$  is obtained and presented in Matrix A below:

$$A = \begin{bmatrix} 0.125 & 0.051 & 0.135 & 0.208 \\ 0.188 & 0.205 & 0.057 & 0.417 \\ 0.156 & 0.077 & 0.154 & 0.375 \\ 0.125 & 0.154 & 0.269 & 0.000 \end{bmatrix}$$

To obtain required values from each sector in order to produce a unit of output, the direct requirements table below provides details:

**Table 4.12. Income Direct requirements table with households**

<b>Purchasing Sectors</b> <b>Selling Sectors</b>	<b>Tourism</b>	<b>Agriculture</b>	<b>Transport</b>	<b>Households</b>
<b>Tourism</b>	<b>0.125</b>	<b>0.051</b>	<b>0.135</b>	<b>0.208</b>
<b>Agriculture</b>	<b>0.188</b>	<b>0.205</b>	<b>0.057</b>	<b>0.417</b>
<b>Transport</b>	<b>0.156</b>	<b>0.077</b>	<b>0.154</b>	<b>0.375</b>
<b>Households</b>	<b>0.125</b>	<b>0.154</b>	<b>0.269</b>	<b>0</b>
<b>Final payments</b>	<b>0.406</b>	<b>0.513</b>	<b>0.385</b>	<b>0</b>
<b>Total</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>

As mentioned earlier, this table displays the portion of total income required from each sector for a unit of output. From this direct requirements table with households, and applying the earlier used formula, the Leontief inverse obtained represents the income multipliers type II.

$$[I - A]^{-1} = \begin{bmatrix} 0.335 & 0.224 & 0.393 & 0.519 \\ 0.546 & 1.520 & 0.485 & 0.929 \\ 0.462 & 0.336 & 1.537 & 0.813 \\ 0.375 & 0.352 & 0.537 & 1.427 \end{bmatrix}$$

These multipliers are presented in the table below called ‘total requirements table’ with households. In addition to direct and indirect effects obtained in type I multipliers, type II multipliers also include induced effects and the following table is the combination of the three effects: direct, indirect and induced.

**Table 4.13. Income Total requirements table with Households**

<b>Purchasing Sectors</b> <b>Selling Sectors</b>	<b>Tourism</b>	<b>Agriculture</b>	<b>Transport</b>	<b>Households</b>
<b>Tourism</b>	<b>1.335</b>	<b>0.224</b>	<b>0.393</b>	<b>0.519</b>
<b>Agriculture</b>	<b>0.546</b>	<b>1.520</b>	<b>0.485</b>	<b>0.929</b>
<b>Transport</b>	<b>0.462</b>	<b>0.336</b>	<b>1.537</b>	<b>0.813</b>
<b>Households</b>	<b>0.375</b>	<b>0.352</b>	<b>0.537</b>	<b>1.427</b>
<b>Total</b>	<b>2.713</b>	<b>2.432</b>	<b>2.952</b>	<b>3.688</b>

The size of income multipliers for the three sectors under consideration are as follows: 2.713; 2.432 and 2.952 respectively for tourism, agriculture and transport. These values indicate the total income multiplier effects over the local economy. For a change of income of RWF 1 in the tourism sector, there is a total income of RWF 2.713 generated in the local economy. These income figures emerge from direct, indirect and induced tourism effects. They represent the total economic effects of the tourism sector over Rwandan economy. With income multipliers type II, transport is the leading sector, followed by tourism and agriculture. Breaking down the total effects for the three sectors model, the following effects are obtained:

**Table 4.14. Total income multiplier effects of tourism, agriculture and transport in Rwanda, in 2015**

<b>Effects</b>	<b>Tourism</b>	<b>Agriculture</b>	<b>Transport</b>
Direct	1	1	1
Indirect	0.749	0.521	0.564
Induced	0.964	0.911	1.388
<b>Total</b>	<b>2.713</b>	<b>2.432</b>	<b>2.952</b>

For the three sectors induced effects appear to be bigger than indirect effects. From what has been developed in an early chapter it can be observed that agriculture in Rwanda absorbed a large amount of the labor force. However, agriculture was not improving people's lives for those relying on it as a source of income. Its value added to GDP was also decreasing as the service sector was developing. The results presented in this study prove that investment in other sectors such as tourism can yield greater total profits for the Rwandan economy than agriculture. In what follows tourism employment multiplier effects on Rwandan economy are presented and analyzed.

#### **4.4.2. Tourism employment multiplier effects in Rwanda in 2015**

To determine the size of employment multipliers in the tourism sector, the same procedure as for the income multiplier is followed. Below, an employment transactions table is presented where the quantity of labor needed in each sector to satisfy the demand of other sectors is given.

**Table 4.15. Employment transactions table (in thousands of workers per RWF billion of output)**

<b>Purchasing Sectors</b> <b>Selling Sectors</b>	<b>Tourism</b>	<b>Agriculture</b>	<b>Transport</b>	<b>Final labor demand</b>	<b>Total output</b>
<b>Tourism</b>	<b>5</b>	<b>4</b>	<b>6</b>	<b>19</b>	<b>34</b>
<b>Agriculture</b>	<b>2</b>	<b>6</b>	<b>5</b>	<b>27</b>	<b>40</b>
<b>Transport</b>	<b>3</b>	<b>4</b>	<b>4</b>	<b>37</b>	<b>48</b>
<b>Final labor supply</b>	<b>24</b>	<b>26</b>	<b>33</b>	<b>0</b>	<b>83</b>
<b>Total employment</b>	<b>34</b>	<b>40</b>	<b>48</b>	<b>83</b>	<b>171</b>

In order to satisfy the demands of tourism, agriculture, transport and other sectors, the tourism sector employed 34 000 workers in 2015. The agriculture sector, on the other hand, employed up to 40 000 workers to produce outputs needed in other economic sectors; while the transport service engaged 48 000 people to satisfy the total demand of other sectors. The amount of labor used in agriculture is based on estimations of required labor instead of available labor to satisfy tourism and transport sectors. Given that the labor force in agriculture in Rwanda is underemployed, estimating employment multiplier effects based on available labor rather than required labor would overestimate the employment potential in the agriculture sector. It is in that sense that required labor rather than available labor was used. The employment transactions table presented above allows for the determining of the technical coefficients presented in matrix A below.

$$A = \begin{bmatrix} 0.147 & 0.10 & 0.125 \\ 0.059 & 0.15 & 0.104 \\ 0.088 & 0.10 & 0.083 \end{bmatrix}$$

The direct requirements table displays the proportion of labor force needed from each sector to produce a unit of output in every single sector.

**Table 4.16. Employment Direct requirements table**

<b>Purchasing Sectors</b> <b>Selling Sectors</b>	<b>Tourism</b>	<b>Agriculture</b>	<b>Transport</b>
<b>Tourism</b>	<b>0.147</b>	<b>0.1</b>	<b>0.125</b>
<b>Agriculture</b>	<b>0.059</b>	<b>0.15</b>	<b>0.104</b>
<b>Transport</b>	<b>0.088</b>	<b>0.1</b>	<b>0.083</b>
<b>Final labor supply</b>	<b>0.706</b>	<b>0.65</b>	<b>0.688</b>
<b>Total</b>	<b>1</b>	<b>1</b>	<b>1</b>

In order to produce a unit of output the tourism sector needed 0.147; 0.059; 0.088 and 0.706 proportions of workers respectively from tourism, agriculture, transport and other sectors. The agriculture sector used 0.1 from tourism, 0.15 from agriculture, 0.1 from transport and 0.65 from other sectors to produce a unit of total output. Likewise the transport sector required 0.125 workers from tourism, 0.104 from agriculture and 0.083 from the transport service.

Applying the Leontief inverse formula to the above matrix we obtain the following:

$$[I - A]^{-1} = \begin{bmatrix} 1.202 & 0.163 & 0.182 \\ 0.099 & 1.206 & 0.150 \\ 0.126 & 0.147 & 1.124 \end{bmatrix}$$

Because direct and indirect effects need to be captured first, households have been omitted in the model and are only come in at a later stage. Total direct and indirect employment multipliers are displayed in the total requirements table below.

**Table 4.17. Employment Total requirements table**

<b>Purchasing Sectors</b> \ <b>Selling Sectors</b>	<b>Tourism</b>	<b>Agriculture</b>	<b>Transport</b>
<b>Tourism</b>	<b>1.202</b>	<b>0.163</b>	<b>0.182</b>
<b>Agriculture</b>	<b>0.099</b>	<b>1.206</b>	<b>0.150</b>
<b>Transport</b>	<b>0.126</b>	<b>0.147</b>	<b>1.124</b>
<b>Total</b>	<b>1.427</b>	<b>1.516</b>	<b>1.456</b>

The employment type I multipliers estimated for the three-sector model are 1.427 for tourism, 1.516 for agriculture and 1.456 for transport. When comparing these three sectors with their direct and indirect effects we note that employment multiplier in tourism is slightly smaller than in other sectors with agriculture as a leading sector. Remember that both transport and agriculture sectors used here are tourism related, i.e. agriculture and transport sectors have these impacts because of the tourism sector they are linked to.

In interpreting tourism employment multiplier it can be said that a 1 employee increase in tourism gives rise to a total employment change of 1.427 jobs in the study area from direct and indirect linkages. As mentioned earlier, type I multipliers give only a partial view of economic impacts and there is a need to include households in the original model to get a holistic impact from the sectors under study.

**Table 4.18. Employment transactions table with households (in thousands of workers per RWF billion of output)**

<b>Purchasing Sectors</b> <b>Selling Sectors</b>	<b>Tourism</b>	<b>Agric ulture</b>	<b>Tran sport</b>	<b>House holds</b>	<b>Final labor demand</b>	<b>Total output</b>
<b>Tourism</b>	<b>5</b>	<b>4</b>	<b>6</b>	<b>9</b>	<b>10</b>	<b>34</b>
<b>Agriculture</b>	<b>2</b>	<b>6</b>	<b>5</b>	<b>11</b>	<b>16</b>	<b>40</b>
<b>Transport</b>	<b>3</b>	<b>4</b>	<b>4</b>	<b>13</b>	<b>24</b>	<b>48</b>
<b>Households</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>0</b>	<b>0</b>	<b>33</b>
<b>Final labor supply</b>	<b>14</b>	<b>15</b>	<b>21</b>	<b>0</b>	<b>0</b>	<b>50</b>
<b>Total employment</b>	<b>34</b>	<b>40</b>	<b>48</b>	<b>33</b>	<b>50</b>	<b>171</b>

This transactions table provides the inter-sectoral linkages between the three sectors but also with households. It informs on the number of workers needed by each sector and allows for the determining of the proportion of workers required for each sector to produce a unit of output. Based on the above table, and applying the formula below:

$$a_{ij} = \frac{z_{ij}}{q_{ij}}$$

The following matrix A of technical coefficients is obtained:

$$A = \begin{bmatrix} 0.147 & 0.100 & 0.125 & 0.273 \\ 0.059 & 0.150 & 0.104 & 0.333 \\ 0.088 & 0.100 & 0.083 & 0.394 \\ 0.294 & 0.275 & 0.250 & 0.000 \end{bmatrix}$$

In order to obtain a unit of output in each sector the following proportions in the direct requirements table below are needed from every sector concerned.

**Table 4.19. Employment Direct requirements table with households**

<b>Purchasing Sectors</b> <b>Selling Sectors</b>	<b>Tourism</b>	<b>Agriculture</b>	<b>Transport</b>	<b>Households</b>
<b>Tourism</b>	<b>0.147</b>	<b>0.1</b>	<b>0.125</b>	<b>0.273</b>
<b>Agriculture</b>	<b>0.059</b>	<b>0.15</b>	<b>0.104</b>	<b>0.333</b>
<b>Transport</b>	<b>0.088</b>	<b>0.1</b>	<b>0.083</b>	<b>0.394</b>
<b>Households</b>	<b>0.294</b>	<b>0.275</b>	<b>0.25</b>	<b>0</b>
<b>Final labor supply</b>	<b>0.412</b>	<b>0.375</b>	<b>0.438</b>	<b>0</b>
<b>Total</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>

This table displays the fraction of total labor required from each sector to produce a unit of output. From the matrix A above, and applying the earlier used formula, the Leontief inverse obtained is:

$$[I - A]^{-1} = \begin{bmatrix} 1.514 & 0.478 & 0.467 & 0.756 \\ 0.434 & 1.544 & 0.456 & 0.812 \\ 0.488 & 0.512 & 1.454 & 0.876 \\ 0.686 & 0.693 & 0.626 & 1.665 \end{bmatrix}$$

The total employment multipliers type II is displayed in the total requirements table below with households. This gives the total effects of employment for the three-sector model which is the sum of direct, indirect and induced effects.

**Table 4.20. Employment Total requirements table with Households**

<b>Purchasing Sectors</b>	<b>Tourism</b>	<b>Agriculture</b>	<b>Transport</b>	<b>Households</b>
<b>Selling Sectors</b>				
<b>Tourism</b>	<b>0.514</b>	<b>0.478</b>	<b>0.467</b>	<b>0.756</b>
<b>Agriculture</b>	<b>0.434</b>	<b>1.544</b>	<b>0.456</b>	<b>0.812</b>
<b>Transport</b>	<b>0.488</b>	<b>0.512</b>	<b>1.454</b>	<b>0.876</b>
<b>Households</b>	<b>0.686</b>	<b>0.693</b>	<b>0.626</b>	<b>1.665</b>
<b>Total</b>	<b>3.122</b>	<b>3.227</b>	<b>3.003</b>	<b>4.109</b>

The sizes of employment multipliers obtained are as follows: 3.122 for tourism; 3.227 for agriculture and 3.003 for transport. These multipliers reflect the total effects of the three sectors. The economic interpretation of these multipliers is that for every additional job created in the tourism sector, there is a generation of 3.122 total jobs in the economy resulting from direct, indirect and induced effects. This total impact is more than double of the original impact which is the direct effect. The following table presents the breakdown of total employment effects with details on direct, indirect and induced effects for the three sectors.

**Table 4.21. Total employment multiplier effects of tourism, agriculture and transport in Rwanda, in 2015**

<b>Effects</b>	<b>Tourism</b>	<b>Agriculture</b>	<b>Transport</b>
Direct	1	1	1
Indirect	0.427	0.516	0.456
Induced	1.695	1.711	1.547
<b>Total</b>	<b>3.122</b>	<b>3.227</b>	<b>3.003</b>

From the above chart it can be observed that agriculture presents the biggest employment multiplier, followed by tourism and transport for 2015. However, the difference between the three sectors is not big. This can be explained by the fact that agriculture in Rwanda more than any other sector uses more labor force than capital. We have seen in chapter two of this thesis that the large majority of labor forces in Rwanda are engaged in agriculture. Furthermore, it was observed that the economic structure of agriculture in Rwanda is that the sector is labor-intensive with low added-value.

It follows that employment multiplier in agriculture is bigger than in other sectors taken into account in this study, but with a lowest income multiplier. At the induced level employment multiplier effects are larger than indirect effects for all sectors considered and even bigger than the employment direct effects. It is believed that an investment in tourism not only creates good jobs for people, but also increases job generation in other sectors as a result of its multiplier effects. Therefore, we argue that increased employment which is associated with salaries paid to workers contributes to the GDP. To sum up, both tourism income and employment multipliers obtained for Rwanda for the year 2015 are put together for comparison.

**Table 4.22. Tourism income and employment multipliers total effects**

<b>Effects</b>	<b>Income multiplier</b>	<b>Employment multiplier</b>
Direct	1	1
Indirect	0.749	0.427
Induced	0.964	1.695
<b>Total</b>	<b>2.713</b>	<b>3.122</b>

When comparing income and employment multipliers in the tourism sector in Rwanda, results show that the total employment multiplier effect is bigger than the total income multiplier. The explanation to this is that tourism like agriculture is a labor-intensive sector. When it comes to income and employment multipliers, labor-intensive sectors present larger total employment multipliers than total income multipliers (Stynes, 2002).

However, if we look at the breakdown of these two variables, the indirect impact of tourism income appears to be bigger than the indirect effect of tourism employment. At the induced level the opposite is observed and tourism employment multiplier is bigger than income, but also bigger than direct and indirect employment multipliers. This is partly explained by the nature of tourism as a labour-intensive sector, and it is also in line with the theories discussed in earlier chapters (Dietzenbacher, 2005). According to Dietzenbacher (2005). Labor-intensive sectors such as tourism tend to have relatively larger induced effects than indirect effects, as a result of using more labor than capital inputs. In real values the contribution of tourism sector to income generation and job creation in Rwanda in 2015 is estimated as follows:

**Income generated:**

Direct income = RWF 32 billion

Indirect income = RWF 32 billion × 0.713 = RWF 23.968 billion Induced

income = RWF 32 billion × 0.964 = RWF 30.848 billion

Total income created as a result of tourism in Rwanda in 2015 = RWF 32 billion+ RWF 23.968 billion+ RWF 30.848 billion = RWF 32 billion×2.713 = RWF 86.816 billion

**Jobs created:**

Direct jobs = 34 000 jobs

Indirect jobs =  $34\,000 \times 0.427 = 14,518$  Jobs Induced

jobs =  $34,000 \times 1.695 = 57,630$  Jobs

Total jobs created as a result of tourism in Rwanda in 2015 =  $34,000 + 14,518 + 57,630 = 34,000 \times 3.122 = 106,148$  Jobs

In addition to the direct effects that concern only the studied sector, tourism in this case, the remaining income/employment impacts (indirect and induced) are generated in other economic sectors as a result of initial injection of income and employment in tourism. This means that the sector, for instance tourism, does not only contribute to economic growth of Rwanda, but also stimulates other sectors to do so. Failure to recognize the value of the tourism sector limits the country's economic performance. Using the income and employment multipliers estimated above, we can simulate tourism growth scenarios and predict the outcome for policy strategies. Three cases are considered for this prediction:

- (a) We assume an increase of 10% for the tourism income multiplier holding constant the initial income injected in tourism.
- (b) We assume an increase of 10% for the tourism income multiplier and an increase of 7% for the income injected in tourism. Here we assume that tourism grows at the same pace as the GDP (7% in 2015).
- (c) We assume an increase of 10% in both cases. A policy aiming at promoting tourism growth under the above scenarios expects the following results displayed in the table below.

**Table 4.23. Good case scenario with tourism income growth**

Scenario	Income multiplier	Initial income (in RWF Billion)	Total income (RWF Billion)	Policy stimulation -Change in growth (7%) -Change in multiplier (10%)
Initial Situation	2.713	32	86.816	
(a) (10% and 0%)	2.9843	32	95.4976	10%
(b) (10% and 7%)	2.9843	34.24	102.1824	17.7%
(c) (10% and 10%)	2.9843	35.2	105.0473	21%

Three important messages are derived from the above simulations with regard to tourism growth strategy:

Firstly, a policy aiming at increasing tourism multipliers (tourism-related services) and leaving unchanged the direct income injected in the sector impacts the growth of the economy by the same percentage increase applied to the multiplier. Likewise, an increase in direct income in tourism without increasing related services leads to the same results as an increase of the multiplier with a constant direct income in this case (a)

Secondly, an increase of 10% in tourism multipliers and 7% in tourism direct income assuming that the latter is growing at the same pace as the GDP (in 2015), have a much greater total effect on the economy than the simple aggregation of the increased percentages (17,7% > 17%) in case (b).

Thirdly, an increase of the same percentage, say 10% in each case, gives rise to a total effect which is much higher than the double of the percentage increase (21%>20%). In this case the higher the percentage increase of tourism direct income and related services is, the greater the total effect obtained out of this growth strategy (c).

More importantly, it is proved that a combined increase in both tourism and its related services give greater impact than the simple aggregate of the two percentages increase (b and c).

Therefore, it is essential that any development plan aiming at boosting the impact of tourism on economic growth and on economic development should tackle both the tourism sector and its related services. To emphasize the above it can be asserted that backward and forward linkages are very important in tourism development and need to be strengthened to yield a greater impact on the rest of the economy. This is also in line with the literature explored in previous chapters indicating that tourism development should not be done in isolation but developed together with its supporting sectors. Similar scenario cases are applied to tourism employment growth and results are displayed in the table below.

**Table 4.24. Good case scenario with tourism employment growth**

Scenario	Employment multiplier	Initial jobs in tourism	Total jobs created	Policy simulation - change in growth (7%) - change in multiplier (10%)
Initial situation	3.122	34 000	106 148	
(a) (10% increase and 0%)	3.4342	34 000	116 763	10%
(b) (10% and 7%)	3.4342	36 380	124 936	17.7%
(c) (10% and 10%)	3.4342	37 400	128 439	21%

For the case of tourism employment growth, the interpretation is the same as for the tourism income growth above-presented. The prediction based on employment simulations shows also that a combined growth gives rise to greater proportions of the total economic impact than a simple increase of tourism or its related services. In the next section a summary is presented and a conclusion to the chapter drawn.

#### **4.5. Conclusion**

Tourism is an economic activity which is part of the service sector with backward and forward linkages. However, given the nature of tourism, many activities that tourists get involved in are not all defined as tourism activities and therefore make tourism a difficult sector to define and to estimate its impacts. Tourism, as seen in this chapter, has a diversity of economic impacts. It contributes to income, employment, sales, profits and tax revenues in Rwanda. The most direct effects occur within the tourism and tourism-related sectors such as hotels and restaurants, leisure pursuits, transport, etc. Through indirect and induced effects tourism stimulates most sectors of the economy. Results from this study have proved that tourism in Rwanda has a positive impact on the economy judged here by income and employment generated.

As far as Hotels considered in this study are concerned, each employed above 100 workers and Rwandese employees largely outnumbered outsiders. Note that this entails only direct fulltime jobs in those tourism establishments without considering part-time, indirect and induced jobs. This is beneficial to the country as far as resolving unemployment issues and improving people's well-being are concerned. The job performed in these tourism establishments allows workers to earn income which helps them to satisfy their basic needs and fulfill their other commitments. As revealed during the survey, income earned by workers was used for household consumption, savings, and payment of taxes, to mention just a few.

However, the large proportion of their income was dedicated to household consumption. This has also indirect and induced impacts on the development of local businesses that cater for household needs. In addition, income spent on taxes contributes to increasing government revenues, therefore making government expenditures possible. Likewise, income raised in the hotels was important and beneficial to Rwandan economy, particularly to local business people in that, as has been indicated, the large portion of the tourism turnover was used to buy inputs from local markets. Therefore, investing in a dynamic sector such as tourism, which is labor-intensive, is an efficient investment for a country such as Rwanda with a high rate of unemployment and with many of its people living in poverty.

Considering the size of tourism income and employment multipliers in Rwanda, the study confirms that tourism income and employment multipliers are positive. The total tourism income multiplier determined was 2.713, while the total employment multiplier was 3.122 for the year 2015. These multipliers mean that for every extra unit of income injected into

tourism in Rwanda, the total income in the whole economy increased by 2.713. In addition, for every new job created in the tourism sector in Rwanda, 3.122 total jobs were generated into the economy resulting from direct, indirect and induced effects. These multipliers show the total effects that the tourism sector in Rwanda had on the rest of the economy during the year 2015.

The importance of tourism as revealed in this chapter, and the poor consideration the sector has received as shown in the previous chapter, call for a proper investment to make use of the sector's potential to boost Rwandan economy. Furthermore it is essential that any development plan aiming at boosting the impact of tourism on economic growth and on economic development should tackle both the tourism sector and its related services. To sum up, it can be concluded that tourism is an activity integrated into the economic system although it does not appear in the national accounts. It plays an important role in the Rwandan economy by stimulating other economic activities through its powerful multiplier effects.

However, due to lack of a proper planning and accurate data on tourism, this role is not well realized and utilized in Rwanda. A good understanding of tourism's economic impacts is therefore important for the tourism industry, for government and the community as a whole. The extent to which tourism contributes to Rwandan economy goes far beyond considering only the aggregates of income and employment considered in this study. In the next chapter, a summary, a conclusion and policy implications for this research are presented.

## **CHAPTER FIVE: CONCLUDING REMARKS AND POLICY IMPLICATIONS**

This study has investigated the proposition that tourism contributes significantly to Rwanda's economic development through income and employment generation. Based on a vast body of international evidence and economic theories, we have developed an analytical model which was then tested using Rwandan data. In this chapter we summarize our core findings, highlight major policy implications for Rwanda and similar economies and outline challenging questions for future research. This study proposes a refinement of the multipliers to enable better capture of the total effects of tourism on the economy.

### **5.1. Summary and conclusion**

This study has investigated the income and employment multiplier effects of tourism in Rwanda. The main objective was to show the extent to which tourism contributes to economy. This was done by analyzing existing literature on tourism and by examining the situation of tourism in Rwanda in general and by taking into consideration the case study of hotels in particular. With regard to tourism contribution to Rwandan economy in general, the findings from this study reveal that the sector's contribution has been of moderate value. This was a result of both poor tracking the records of tourism statistics as well as the poor development of the sector.

The study has explored the mechanisms through which tourism contributes towards economic growth and the macroeconomic consequences of expanding this sector over other traditional economic sectors. We have examined these dynamics in the context of underdeveloped economies, such as that of Rwanda. Traditionally, these are economies heavily dependent on their abundant natural resources. Both microeconomic and macroeconomic linkages to tourism helped the sector to perform well. Existing studies have emphasized the positive role that tourism plays in diverse economies, including LDCs.

Given the comparative advantage that these countries present in terms of tourism products, it was found that opportunities offered by the tourism sector can be exploited to improve their economic wealth. While tourism has been identified as a source of foreign earnings, international trends show that the African continent receives a very little share of international tourists' arrivals and receipts compared to the rest of the world. Furthermore, it was found that the development of the tourism sector in LDCs could lead to shrinkage of the primary export sector. However, this was likely to happen only in cases where factors of production are fully and efficiently utilized, where there is mobility of factors and where the

demand for tradable and non-tradable goods is perfectly elastic. However, for most LDCs, these conditions are not found and the development of tourism could expand economic growth and contribute to development.

Based on the survey for this study, tourism in Rwanda was found to perform quite well. The findings indicate that hotels in Rwanda employ many people, skilled and low-skilled labor. Income is distributed and supports many Rwandese families, as revealed during the survey. This case study has established that tourism contributes significantly to Rwandan economy through income and employment generation.

With the input-output model from data collected in Rwanda, the results have proved that tourism has positively impacted on income and employment. For every RWF1 income injected in the tourism sector in Rwanda in 2015, there was a total income of RWF 1.749 generated in the study area as a result of direct and indirect linkages only. The total effect of tourism income multiplier was estimated at 2.713. This means that for a change of income of RWF 1 in the tourism sector, there is a total income of RWF 2.713 generated in the local economy. This resulted from direct, indirect and induced-tourism effects with respective values of 1; 0.749; 0.964. Findings indicate also that tourism income-induced effects are more significant than indirect effects.

Moreover, the results reveal significant direct and indirect employment opportunities from the tourism industry. Those opportunities provide important sources of incomes to the households. Essentially, the tourism employment multiplier effect in Rwanda is positive. The findings reveal that for every additional job created in the tourism sector, there is a creation of 3.122 total jobs in the economy resulting from direct, indirect and induced effects. The values for these three effects are 1, 0.427 and 1.695 respectively for direct, indirect and induced employment effects. The employment induced effects are larger than direct and indirect employment effects.

Intersectoral linkages presented in this study should be interpreted with caution. The analysis is useful to provide ground for assessment of the effectiveness of development strategies that aim to strengthen intersectoral linkages such as between tourism and agriculture. The multipliers obtained represent the situation of the studied sectors at a particular time (year 2015 for this study) and should not be compared over time. The knowledge of tourism multipliers and intersectoral linkages provide important guidance on when it is most appropriate to be used.

Tourism expansion in Rwanda was seen to have potential to stimulate economic growth and contribute to the country's development. It can also contribute to poverty alleviation. It has been observed that income generated from tourism in Rwanda helps many households to satisfy their basic needs and to lift up their living conditions far above the poverty line. Furthermore, tourism in Rwanda was seen to have the capacity of accommodating both skilled and low-skilled labor. However, it was also found that if not properly controlled, the sudden development of tourism can have negative impacts such as the appreciation of the real exchange rate and the degradation of the environment.

Tourism in Rwanda can stimulate the development of important economic activities such as tour operation, curio shops, handicraft sales and cultural exhibition in addition to other tourist attractions. Tourism's strong linkages (backward and forward linkages) with other economic sectors present opportunities for small businesses that most poor people can be involved in. In conclusion, tourism can be an alternative sector to boost LDCs in general and Rwanda in particular. Given that tourism cannot develop without the intervention of many actors, we present in what follows policy implications.

## **5.2. Policy implications**

This study examined the role of tourism in Rwanda through income and employment multipliers. Generally, the findings indicate that tourism has the potential to improve Rwandan economic growth. It also has a strong potential to reduce poverty and unemployment. However, there are policy issues that need to be addressed for tourism to efficiently achieve its goals.

**These issues are the following:**

1. Given the potential that the tourism sector in Rwanda has, it needs to be developed and promoted together with its related industries. It was found that a combined development policy dealing with tourism and its related services was a better strategy than developing singly the tourism sector.
2. In order to benefit more from tourism, the use of local products should be promoted and possible leakages resulting from imports of goods and services to serve tourists should be controlled. Equally important is to encourage the production of local goods which are similar in standard and quality to international goods that tourists are attracted to. This has the double benefit of satisfying tourist needs and of increasing sales for local products.
3. In order for tourism to develop in Rwanda, there is an imperative need to know where the sector stands. In this regard, tourism needs to be considered as a separate sector and research needs to be done on a regular basis to have a clear picture of the sector in order to develop it correctly. Statistical data needs to be made available regularly, and tourism intersectoral linkages with other economic sectors provided.
4. Given that genocide has left a very bad image of Rwanda as an unsafe place, there is a need to engage in a general campaign to address this issue as it can seriously destroy tourism efforts.
5. Tourism development and environmental conservation need to be dealt with together. The development of tourism should not be done separately but together with that of conservation and sustainable development.
6. Tourism products in Rwanda need to be diversified and need to include all the attractions that the country is endowed with. These include, among others, the rich cultural exhibition. People including the poor should be encouraged to exhibit goods and services of their rich cultural heritage. This is particularly beneficial to the poor because it requires less skill and rewards directly its producer, the poor in this case.

### 5.3. Recommendations

The development of tourism is not only a policy issue but one where private investors should also be encouraged to explore and exploit this opportunity. In this section recommendations for private investors and future research are formulated.

To private investors, the following recommendations apply:

(a) Tourism in Rwanda presents much potential that could benefit people who invest in it. These range from investments in the building of tourists' facilities such as hotels and guests houses of international standard close to tourism natural attractions; in the improvements of the communication and transportation sector to the diversification of products offered.

Private investors should be aware of what is happening around the world and inform people who are interested in travel, what they are offering. In this regard it is important to know that the tourism business, like any other, needs good advertising aimed at its target market. Modern technology, such as the use of internet facilities, should help this process enormously.

(b) The use of locally-produced goods to satisfy tourist needs has a triple benefit. Firstly, it gives tourists a chance to have new experiences. Secondly, it benefits private investors because they buy local products at relatively cheaper rates than the cost of importing these products from abroad. Thirdly, it impacts directly the local people, who sell the products to private investors, therefore, increasing their income. In addition, by the multiplier effects, the impact can go further and improve many people's lives.

### **For further research:**

This study was limited to the analysis of income and employment multiplier effects of tourism in Rwanda. The study focused on a case study of hotels as major tourism components. For future research, the following area could be researched:

- a) Economic intersectoral linkages of the tourism sector in Rwanda. It is recommended that there be integration of other aggregates such as government revenue and that the economic intersectoral linkages with all sectors be considered. It would also be of interest to research the economic impacts of tourism in general and not only isolated cases. Although this would involve high costs, it provides a holistic picture of tourism in Rwanda. This research however can only be carried out easily at a national level and not by individual researchers for their own academic purposes given its requirements in time and money.
- b) Under which circumstances could tourism development lead to Dutch Disease? To induce the Dutch Disease, the magnitude of tourism must be big. It is important therefore to determine the threshold for tourism development, especially in case of LDCs with segmented tourism sectors for tourism to induce the shrinkage of other primary sectors.

This study has established evidence to suggest some contribution to a better understanding of the tourism sector, particularly in Rwanda. A light is shed on the understanding of macro and micro level linkages in the sector. Therefore, the study contribution lies in providing particular experience of tourism multiplier effects in Rwanda as well as in the understanding of the need for refinement of the multiplier to better capture the effects of tourism on the economy.

The study has established that, although there is a growing literature on tourism in the area of development economics, empirical studies are limited to regional studies. This literature deals with broad issues such as tourist arrivals and tourism contribution to GDP. This study has filled the empirical gap by considering a single country, Rwanda, at the macro level and by exploring the objectives at the micro level of hotels. The study has contributed to the understanding of tourism multiplier effects in Rwanda. The study demonstrates that through its powerful intersectoral linkages, tourism contributes and improves the economic wealth of many developing countries, including Rwanda.

The study also analyzed the macroeconomic consequences of the expansion of the service sector. In this line, it has extended the Dutch Disease theory and natural resource curse by looking at the service sector and by internationalizing it.

Tourism was regarded as an export sector given the foreign earnings it generates. Analyzing the above economic theories in the case of tourism expansion, this study finds that the sudden development of the sector can be accompanied by the shrinkage of the primary export sector (agriculture in many developing economies), therefore inducing the Dutch Disease. However, Rwanda takes a couple of years before experiencing the Dutch Disease given the nature of the tourism it practices.

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## Appendix A

### Questionnaire for tourism business establishments (Pilot study)

#### *I. Identification of respondent*

1.1. What is your main activity?

1	Hotel/Motel	
2	Restaurant	
3	Transport	
4	Foreign exchange	
5	Other (specify)	

1.2. Do you have a tourism certificate or registration?

1	Yes	
2	No	

1.3. When did you start your business?

1	Before 1994	
2	After 1994	

1.4. Nationality of owner

1	Rwandese	
2	Others	

#### *II. Information regarding income sales*

2.1. For the year 2015, how much income sales (per quarter) did your business generate (in Rwandan Francs)?

Amount \ Quarter	Q1	Q2	Q3	Q4
< 100 000				
100 000- 500 000				
500 000-1000 000				
> 1000 000				

2.2. How do you spend the income generated from your business?

1	Import inputs	
2	Buy inputs from local markets	
3	Savings	
4	Household consumption	
5	Taxes	
6	Wages	
7	Other (specify	

2.3. Which percentage of your income is spent on the following items?

Items \%	1-25	26-50	51-75	76-100
1. Import of inputs				
2. Inputs from local market				
3. Savings				
4. Household consumptions				
5. Taxes				
6. Wages				
7. Other (specify)				

### ***III. Information on employment***

3.1. How many workers do you employ in your business?

1	1-50
2	51-100
3	101-150
4	151-200
5	>200

3.2. Which percentage of your workers are nationals?

1	1-25
2	26-50
3	51-75
4	76-100

3.3. Which % of national workers occupies the following position?

Position\%	1- 25	26-50	51-75	76-100
1.High position				
2. Middle position				
3. Low position				

3.4. Which % of national workers fulfill full time job?

1	1-25	
2	26-50	
3	51-75	
4	76-100	

3.5. How many people depend on your income, including domestic workers?

1	1 – 3	
2	4 – 6	
3	7 – 9	
4	10 - 12	
5	13 - 15	
6	>15	

## Appendix B

### Questionnaire for workers (pilot study)

#### *I. Identification of respondent*

##### 1.1. Age

1	11-15	
2	16-20	
3	21-25	
4	26-30	
5	31-35	
6	36-40	
7	41-45	
8	46-50	
9	>50	

##### 1.2. Gender

1	Female	
2	Male	

##### 1.3. Marital

1	Single	
2	Married	
3	Divorced	
4	Widower	

#### 1.4.Educational level

1	Primary
2	Secondary
3	Tertiary
4	Other (specify)

#### 2. Nationality

1	Rwandese	
2	Other	

### ***II. Information on employment***

#### 2.1. In which tourism business establishment do you work?

1	Hotel/Motel	
2	Restaurant	
3	Transport	
4	Foreign exchange	
5	Other (specify)	

#### Which position do you occupy?

1	High position	
2	Middle position	
3	Low position	

#### 2.2. Are you part time or full time worker?

1	Full time	
2	Part time	

2.3. For how long have you been working in this establishment?

1	1-5 years	
2	6-10 years	
3	11-15 years	
4	16-20 years	
5	>50 years	

### ***III. Information on income***

3.1. For the last six months of 2015, which range corresponds to your monthly salary (in Rwandan Francs)?

1	< 25 000	
2	25 001 -50 000	
3	50001 - 75000	
4	75001-100000	
5	>100001	

3.2. Which % of your income do you spend on the following items?

Item\%	1 - 25%	26-50%	51-75%	76-100%
1. Household consumption				
2. Taxes				
3. Savings				
4. Other (specify)				

3.3. How many people including domestic workers depend on your income?

1	2 - 3	
2	4 - 6	
3	7 - 9	
4	10 - 12	
5	13 - 15	
6	>15	

## Appendix C

### Questionnaire for tourism business establishments (after pilot study)

#### *I. Identification of respondent*

1.1. What is your main activity?

1	Hotel/Motel	
2	Restaurant	
3	Transport	
4	Foreign exchange	
5	Other (specify)	

1.2. Do you have a tourism certificate or registration?

1	Yes	
2	No	

1.3. When did you start your business?

1	Before 1994	
2	After 1994	

1.4. Nationality of owner

1	Rwandese	
2	Other	

## II. Information regarding income sales

2.1. For the year 2015, how much income sales (per quarter) did your business generate (in thousands of RWF)?

Amount \ Quarter	Q1	Q2	Q3	Q4
1 – 1000				
1001- 2000				
2001 – 3000				
3001 – 4000				
4001 – 5000				
> 5000				

2.2. How do you spend the income generated from your business?

1	Import inputs	
2	Buy inputs from local markets	
3	Savings	
4	Household consumption	
5	Taxes	
6	Wages	
7	Other (specify)	

2.3. Which percentage of your income is spent on the following items?

Items \%	1-25	26 -50	51-75	76 -100
1. Import of inputs				
2. Inputs from local market				
3. Savings				
4. Household consumptions				
5. Taxes				
6. Wages				
7. Other (specify)				

### ***III. Information on employment***

3.1. How many workers do you employ in your business?

1	1-50	
2	51-100	
3	101-150	
4	151-200	
5	>200	

3.2. Which percentage of your workers are nationals?

1	1-25	
2	26-50	
3	51-75	
4	76-100	

3.3. Which % of national workers occupies the following position?

Position\%	1 – 25	26 – 50	56 - 75	76 - 100
1.High position				
2. Middle position				
3. Low position				

3.4. Which % of national workers fulfill full time job?

1	1 – 25	
2	26 -50	
3	51 -75	
4	76 -100	

## Appendix D

### Questionnaire for workers (after pilot study)

#### *I. Identification of respondent*

##### 1.6. Age group

1	11 – 15	
2	16 – 20	
3	21 – 25	
4	26 – 30	
5	31 – 35	
6	36 – 40	
7	41 – 45	
8	46 – 50	
9	> 50	

##### 1.7. Gender

1	Female	
2	Male	

##### 1.8. Marital status

1	Single	
2	Married	
3	Divorced	
4	Widowed	

##### 1.9. Educational level

1	Primary	
2	Secondary	
3	Tertiary	
4	Other (specify)	

##### 1.10. Nationality

1	Rwandese	
2	Other	

## ***II. Information on employment***

2.1. In which tourism business establishment do you work?

1	Hotel/Motel	
2	Restaurant	
3	Transport	
4	Foreign exchange	
5	Other (specify)	

Which position do you occupy?

1	High position	
2	Middle position	
3	Low position	

2.2. Are you part time or full time worker?

1	Full time	
2	Part time	

2.3. For how long have you been working in this establishment?

1	1-5	
2	6-10	
3	11-15	
4	16-20	
5	>20	

### ***III. Information on income***

3.1. For the last six months of 2015, which range corresponds to your monthly salary (in Thousands of Rwandan Francs)?

1	1 – 50	
2	51 - 100	
3	101 - 150	
4	151 - 200	
5	201 - 250	
6	251 - 300	
7	301 - 350	
8	351 - 400	
9	401 - 450	
10	451 - 500	
11	501 - 550	
12	551 - 600	
13	601 - 650	
14	651 -700	
15	701 - 750	
16	751 - 800	
17	801 - 850	
18	851 - 900	
19	901 - 950	
20	951 - 1000	

3.2. Which % of your income do you spend on the following items?

Item%	1-25%	26-50%	51-75%	76-100%
1. Household consumption				
2. Taxes				
3. Savings				
4. Other (Specify)				

3.3. How many people including domestic workers depend on your income?

1	1 – 3	
2	4 – 6	
3	7 – 9	
4	10 – 12	
5	13 – 15	
6	> 15	

## Appendix E

### Secondary data collected

#### I. Household income by main income category and source (%)

Main Household Income Category	Agriculture	Non-Agricultural Self-Employment	Non-Labour income	Agricultural Wages	Non-Agricultural Wages	ALL
Agriculture	84	3	7	4	2	<b>100</b>
Non-Agricultural Self Employment	15	75	5	2	3	<b>100</b>
Non-Labour Income	20	3	71	2	4	<b>100</b>
Agricultural wage Labour	25	1	7	66	1	<b>100</b>
Non-Agricultural wage Labour	14	2	7	1	76	<b>100</b>

Source: NISR, 2014

#### II. Number of tourists who visited Rwanda National Parks and their origin

	2008	2009	2010	2011	2012	2013	2014	2015
<b>Total</b>	<b>64</b>	<b>1,115</b>	<b>892</b>	<b>5,766</b>	<b>10,092</b>	<b>16,088</b>	<b>24,305</b>	<b>22,669</b>
Rwanda	4	150	281	1981	2857	5908	12558	7906
North Africa	0	2	5	21	4	23	46	19
West Africa	0	18	2	6	28	27	81	36
Central Africa	1	70	10	56	136	28	42	
East Africa		29	5	31	252	351	242	286
Europe	17	375	504	2314	4363	6441	7695	9073
North America	14	235	47	706	1303	2119	3012	4617
Latin America	0	13	10	1	23	25	52	
Central America					5			
East America								
West America								
Western Asia	0	0	0	10	265	111		
Other Asian Countries	2	44	28	196		113		
Oceania	6	179	0	353	856		577	
Non identify	20	0	0	91		942		

Source: ORTPN 2015

**III. Tourism receipts from National parks for year 2013 and 2014 (in US\$)**

<b>National park\Year</b>	<b>2013</b>	<b>2014</b>	<b>Change (%)</b>
Volcano National Park	1 377 665	2 213 383	60.7
Akagera National Park	19 736	101 316	413.4
Nyungwe National Park	1 844	40 909	2118.5
<b>TOTAL</b>	<b>1 399 245</b>	<b>2 355 608</b>	<b>68.3</b>

Source: ORTPN, 2015

## Appendix F

### GLOSSARY

**Tourism:** According to the World Tourism Organisation (WTO, n.d), tourism comprises the activities of persons travelling from their usual places to outside their environment for not more than one consecutive year for different purposes (leisure, business and other) excluding purposes connected to a remunerated activity within the visited area. For tourism activity to happen there must be a displacement of an individual by any means of transport, foot travel included. However, any travel is not tourism, but any tourism activity involves travelling with specific purpose mentioned above.

**Multiplier:** an additional activity generated as a result of one form of economic activity is described as a multiplier (Song 2002, Stynes *et al.*, 2000). Multipliers communicate the degree of interdependency between sectors in a country's economy and therefore vary significantly across sectors.

**Income multiplier in tourism:** Income multipliers as suggest Cooper et al. (1998) and Song (2002) are multipliers that measure the additional income injected in the economy as a result of an increase in tourist spending.

**Employment multiplier in tourism:** Employment multiplier in tourism, measures the total amount of job created by an additional unit of tourist expenditure. It is also a ratio of the total employment generated by this same spending to the direct employment alone (Baaijens, Nijkamp, and Van Montfort, 1997; Yusaku, 2002).

**Direct effects in tourism:** According to Carstensen, (2003); Burress, (2003); Pao, (2005), direct effects represent changes in the economic activity resulting from the first round of spending in the tourism industry.

**Indirect effects in tourism:** Indirect effects in tourism represent changes in sales, income and employment within industries that have backward linkages (supplying goods and services) with tourism businesses (Pao, 2005).

**Induced effects in tourism:** Induced effects in the tourism sector reflect increased sales in local industries as a result of households spending of the income earned in tourism and connected industries (Burress, 2003).

**Total effect:** Total effect is the sum of direct, indirect and induced effects.