A Theoretical Model for Successful Management of Revenue for Beneficiary Communities of Renewable Energy Companies in South Africa

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Abstract

The Renewable Energy (RE) sector is one of the fastest growing new industries in the Republic of South Africa (RSA). The Bloomberg New Energy Finance Climate Scope Report recently ranked RSA third globally, behind China and Brazil, and first among African countries for investment in clean energy (Glickman, 2014).

However, one of the main benefits to be derived from the industry, that of socio-economic and enterprise development, is not being achieved owing to unsuccessful management of revenue for beneficiary communities in the renewable energy sector in RSA. Challenges relating to good governance and long-term planning are causing significant harm to communities that are already vulnerable, and are threatening to have a negative effect on the industry's ability to fulfil its obligation to alleviate and, ultimately, eradicate poverty in some of the poorest communities in RSA.

The primary objective of this study is to develop a model for the successful management of revenue for beneficiary communities in the renewable energy sector in South Africa. The model will provide guidance for enterprises, stakeholders, industry experts and community development practitioners within the renewable energy sector towards a pro-active, effective, and relevant decision-making process to achieve success in managing revenue for beneficiary communities. To address the primary objective, a number of secondary objectives were established by developing a conceptual model comprising variables identified in a comprehensive survey of the related literature. A path diagram, based on the formulation of appropriate hypotheses, was constructed between the independent variable and subsequent intervening and dependent variables. Primary data sourced from the identified national and international population of project management practitioners were collected by means of an electronic measuring instrument. The data were analysed and tested empirically by means of Structural Equation Modelling (SEM). The determinants that were identified through a review of the literature as influencing the success of managing revenue for beneficiary communities of renewable energy companies in South Africa included: the use of outside advice, strategic financial management, change management, human development, education, support

services, strategic planning, strategic partnerships, infrastructure development and project management. In order to achieve the objective, the following research questions were formulated:

- What is the influence of external factors such as outside advisers and support services on the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa?
- What is the influence of community transformational factors such as human development and education on the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa?
- What is the influence of infrastructure development on the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa?
- What is the influence of management factors such as change management, financial management and project management on the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa?
- What is the influence of strategic planning on the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa?
- What is the influence of strategic partnerships on the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa?
- What is the influence of good governance on the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa?

The purpose of this research, therefore, was to evaluate and recommend new methodologies to the renewable energy sector by introducing a model of perceived success in managing revenue for beneficiary communities of renewable energy companies in South Africa. The study provided new insight into managing revenue for beneficiary communities in RSA. With the renewable energy sector being one of the fastest growing sectors in the RSA, and the RSA Government being determined

to link the location of renewable energy facilities to economic development, this research has given new insight into managing revenue for SED and ED. The objectives of multi-sector participation, transformational change and sustainable initiatives for beneficiary communities could ensure greater consideration and care when managing beneficiary revenue. Thereby, the opportunity presented by the RE industry for beneficiary communities can change these communities dramatically for the better.

The study makes a valuable contribution to the body of knowledge about managing revenue for beneficiary communities. The proposed model has led to a better understanding of the determinants that influence the success of managing revenue for beneficiary communities, namely: distinctive benefits (a combination of two variables: outside advice and support services), financial management, developmental benefits (a combination of two variables: infrastructure development and education), human development, project management and strategic planning. The study has also opened up new avenues of research into this subject.

Key Words: Renewable energy, green energy, beneficiary communities, community development, revenue management, socio-economic development, economic development and independent power producers

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In accordance with Rule G4.6.3, I hereby declare that the above-mentioned thesis is my own work except as indicated in the references and acknowledgements and that it has not been submitted before for any degree or examination at this or any other university.

.... DATE: 4 March 2017
Ricardo Julian Amansure

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Abbreviations

ABET:	Adult Basic Education and Training
ABREC:	Africa Bio-fuel and Renewable Energy Company
ACAPS:	Assessment Capacities Project
AGFI	Adjusted Goodness-of-Fit Index
AHDR:	Arab Human Development Report
AMNA:	Asset Mapping and Needs Analysis
BB-BEE:	Broad-based Black Economic Empowerment
BNDES:	Banco Nacional de Desenvolvimento Economico e Social
BRICS:	Brazil, Russia, India, China and South Africa
CBO:	Community Based Organisation
CDC:	Community Driven Collaboration
CDD:	Community Driven Development
CDI:	Community Driven Innovation
CDT:	Community Driven Transformation
CEA:	Central Electricity Authority
CEO:	Chief Executive Officer
CFO:	Chief Financial Officer
CLO:	Community Liaison Officer
CM	Change Management
CM:	Change Management
COD:	Commercial Operations Date
COM:	Community Operations Manager
CPO:	Community Projects Officer
CSP:	Concentrated Solar Power
DBSA	Development Bank of Southern Africa
df	Degrees of Freedom
DME:	Department of Minerals and Energy

DoE:	Department of Energy
DSD:	Department of Social Development
DTI:	Department of Trade and Industry
ECD:	Early Childhood Development
ED:	Enterprise Development
EDP:	Economic Development Plan
EDU:	Education
EFA	Exploratory Factor Analysis
EIA:	Energy Information Administration
EME:	Exempted Micro Enterprises
ESCOM:	Electricity Supply Commission
ESMAP:	Energy Sector Management Assistance Programme
FEPD:	Forum for Effective Planning and Development
FET:	Further Education and Training
FM	Financial Management
FM:	Financial Management
GCIS	Government Communications and Information Systems (RSA)
GFI	Goodness-of-Fit Index
GG	Good Governance
GOF:	Goodness-of-Fit
GWEC:	Global Wind Energy Council
HD:	Human Development
HDI:	Human Development Index
HDR:	Human Development Report
IAPP:	International Association for Public Participation
ID	Infrastructure Development
IDC:	Industrial Development Corporation
IDP:	Integrated Development Plan
IEA:	International Energy Agency

IEEE:	International Electrical and Electronics Engineers
IOE:	International Energy Outlook
IPP:	Independent Power Producer
IPPPP	Independent Power Producers Procurement Program
IRENA:	International Renewable Energy Agency
IRP2:	Integrated Resource Plan 2
KMO	Kaiser-Meyer-Olkin
kWH:	Kilowatt Hours
LCR:	Local Content Requirement
LISREL:	Linear Structural Relations
MNRE:	Ministry of New Renewable Energy (India)
MOA:	Memorandum of Agreement
MW:	Megawatt
NDP:	National Development Plan
NGO:	Non-Governmental Organisation
NPC:	Non-Profit Company
OA	Outside Advice
OECD:	Organisation for Economic Cooperation and Development
PM	Project Management
PMBOK:	Project Management Institute Body of Knowledge
PMI:	Project Management Institute
PPA:	Power Purchase Agreement
PPIFA:	Public-Private Infrastructure Advisory Facility
PPP:	Public Private Partnership
PRC:	Project Review Committee
PV:	Photo Voltaic
QSE:	Qualifying Small Enterprise
RE:	Renewable Energy
REFIT:	Renewable Energy Feed-In Tariff

REIPPPP:	Renewable Energy Independent Power Producer Procurement Programme
RFP:	Request for Proposals
RIC:	Renew India Campaign
RMR	Root-Mean-Square Residual
RO:	Research Objectives
RSA:	Republic of South Africa
SANT:	South African National Treasury
SAWEA:	South Africa Wind Energy Association
SEC:	Social and Ethics Committee
SED:	Socio-Economic Development
SEM:	Structural Equation Modelling
SEP:	Stakeholder Engagement Plan
SES:	Stakeholder Engagement Strategy
SP:	Strategic Partnerships
SPL:	Strategic Planning
SRO:	Stakeholder Relations Officer
SS:	Support Service
TPES:	Total Primary Energy Supply
TVE:	Township Village Enterprise
TWh:	Thousand Watts per Hour
UNDP:	United Nations Development Plan
UNEP:	United Nations Environment Programme
UNIDO:	United Nations Industrial Development Organisation
WEC:	World Energy Council
WWEA:	World Wind Energy Association
WWF:	World Wildlife Fund
χ^2	Chi-Square

Chapter 1
Introduction, Problem Statement and Scope of the Study

1.1 Introduction and Background to the Research Study

The renewable energy sector is one of the fastest growing new industries in the Republic of South Africa (RSA). The Bloomberg New Energy Finance Climate Scope Report recently ranked RSA third globally, behind China and Brazil, and first among African countries for investment in clean energy (Glickman, 2014).

However, one of the main benefits to be derived from the industry, that of socio-economic and enterprise development, is not being achieved owing to unsuccessful management of revenue for beneficiary communities in the renewable energy sector in RSA. Challenges in good governance and long-term planning are causing significant harm to communities that are already vulnerable and are threatening to have a negative effect on the industry's ability to fulfil its obligation to alleviate and, ultimately, eradicate poverty in some of the poorest communities in RSA.

The primary objective of this study was to develop a model of successful management of revenue for beneficiary communities in the renewable energy sector in South Africa. This model should guide stakeholders, enterprises, and consultants within the renewable energy sector towards a pro-active, effective, and relevant decision-making process to achieve success in managing revenue for beneficiary communities. To address the primary objective, a number of secondary objectives were established while developing a conceptual model comprising variables identified in a comprehensive survey of the related literature.

Appropriate hypotheses were formulated having constructed a path diagram between the dependent variable and subsequent independent and intervening variables. Data were collected using an electronic survey, measuring primary data sourced from the identified international population of project management practitioners, the data were analysed empirically by means of structural equation modelling. The variables that affect the perceived success of managing revenue for beneficiary community projects that were considered in the model were: outside advice, strategic financial management, change management, human development, education, support services, strategic planning, strategic partnerships, infrastructure development, project management, and governance.

The purpose of this research was to evaluate and recommend new methodologies relating to the renewable energy sector by introducing a model of perceived success in managing revenue for beneficiary communities in RSA.

1.1.1 A Global Perspective on Electricity

Given the global challenges currently facing humankind regarding the production and supply of electricity, one can argue that the demand for electricity worldwide has come a long way since electricity was first introduced commercially in the 19th Century.

The development of electrically powered devices, growing populations, and overall economic prosperity has all added to the insatiable appetite for more electricity. Even though the inventive genius of Thomas Alva Edison began the first commercially viable use of direct current electricity, the brilliance of Nikola Tesla and George Westinghouse made electricity more economically accessible with the creation of alternating current (IEEE, 2011).

Industries invented and sold more electrical appliances as access to electricity became easier for consumers. More appliances and the ability to afford such appliances created a bigger demand for electricity, which led to the need to explore cheaper sources of electrical power generation, which, in turn, led to the advent of coal-fired, hydroelectric and nuclear power stations (Bradley, 2011). The sudden growth in electrically powered devices such as fridges, stoves, toasters, washing machines, tumble-driers, and hairdryers, to name but a few, meant that the race was on to discover a more efficient and cheaper way of producing electricity (Bradley, 2011).

1.1.2 The Status of Electricity in Developed Nations

According to the World Energy Council (WEC) 2013 Survey, the demand for electricity is increasing rapidly and faster than Total Primary Energy Supply (TPES). The WEC (2013) argues that population growth is one of the key drivers of energy demand by demonstrating that, when the world's population grew from 5.5 billion in 1993 to 7 billion in 2011, global electricity production grew from 12 607 TWh in 1993 to 22 202 TWh in 2011. Despite the increase in production, the latest estimates from the World Bank show that 1.4 billion people in the world are still without access to electricity (International Energy Agency, 2010).

According to Wolfram, Shelef and Gertler (2012), the world's poor and marginally poor will play a major role in driving medium-term growth in energy consumption. Wolfram, Shelef and Gertler (2012) developed a model that demonstrates that, as the world's economy expands and the incomes of poor households rise, people are likely to be connected to the electricity grid, gain access to good roads, and purchase energy-using assets like appliances and vehicles for the first time. The result of the increased access to electricity is that the demand for energy increases dramatically, not only at consumer level but also at manufacturer level (Wolfram *et al,* 2012).

Wolfram, Shelef and Gertler (2012) add that the relationship between economic growth and energy consumption in the developing world has been, and is likely to continue to be, influenced heavily by the extent to which economic growth is "pro-poor", i.e. by the extent to which growth improves the economic condition of those previously living in poverty. Table 1.1 shows the number of people who are still without electricity in the top 10 developing countries.

Table 1.1: Top 10 countries where people are without electricity		
Country	**Current availability of electricity supply in the country**	**Number of people without electricity (millions)**
India	65%	404.5
Bangladesh	41%	94.9
Indonesia	65%	81.1
Nigeria	47%	80.6
Pakistan	58%	70.4
Ethiopia	15%	68.7
Democratic Republication of Congo	11%	57.0
Myanmar	13%	42.8
Tanzania	12%	36.8
Source: IEA (2009)		

In Figure 1.1 above, the most dramatic statistic is for India, with a 65% electrification rate and 288 million people without electricity. The difference in numbers appears to be the result of a new method of data collection and highlights the uncertainty about the use of energy in the developing world.

The United States Energy Information Administration, International Energy Outlook, indicated that electricity supplies an increasing share of the world's total energy demand and is the world's fastest growing form of delivered energy as shown in Figure 1.1 (IEO, 2013). The volume of electricity delivered to end users worldwide increased by 2.2% per year between 2010 and 2040, as compared with average growth of 1.4% per year for all delivered energy sources.

The worldwide mix of primary fuels used to generate electricity has changed a great deal over the past four decades (Figure 1.2). Coal continues to be the fuel most widely used to generate electricity, although generation from nuclear power increased rapidly between the 1970s and 1980s, and natural gas-fired generation grew rapidly between the 1980s and 2000s. The use of oil to generate electricity has declined since the late 1970s, when oil prices rose sharply (IEO, 2013). Beginning in the early 2000s, high fossil-fuel prices, combined with concerns about the environmental consequences of greenhouse gas emissions, resulted in the interest in developing alternatives to fossil fuels for electricity generation, particularly nuclear power and renewable energy sources (IEO, 2013).

Figure 1.1: Growth in world total electricity generation and total delivered energy consumption,1990-2040 (index, 1990 = 1)

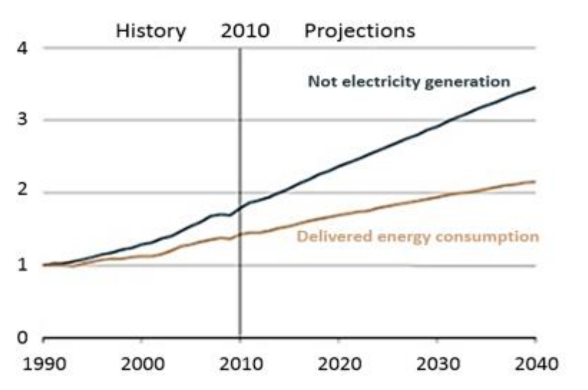
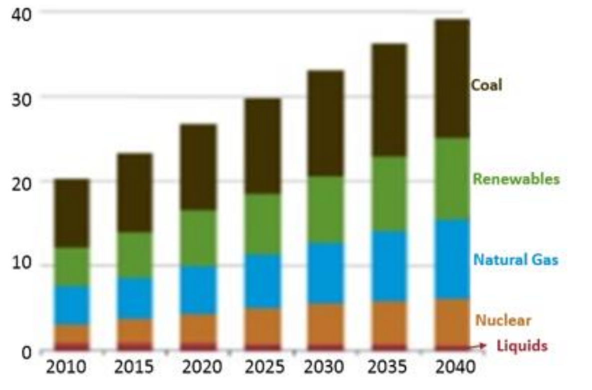


Figure 1.2: World net electricity generation by fuel, 2010-2040 (trillion kilowatt hours)



Source: EIA, 2013

The prediction of a worldwide increase in electricity generation from nuclear power over the next few years remains a concern as energy security and greenhouse gas emissions continue to grow (2013). However, the consequences of the March 2011 disaster at Fukushima Daiichi have had a dramatic effect on the world’s perception of nuclear energy generation as an alternative to fossil fuels and the reduction of greenhouse gas emissions. The Fukushima Daiichi disaster could have long-term implications for the future of world nuclear power development in general (IEO, 2013). In China, where large increases in nuclear capacity were announced, the country halted approval processes for all new reactors until the country’s nuclear regulator completed its safety review. Germany and Switzerland announced plans to phase out or shut down their operating nuclear reactors by 2022 and 2034, respectively (IEO, 2013).

One of the most important recent developments in the world economy is the increasing economic integration of the so-called BRICS countries that are not part of the Organization for Economic Cooperation and Development (OECD), including

Brazil, the Russian Federation, India, China and South Africa. In 2011, BRICS represented over one-quarter of world GDP, up from 15% in 1990. Also in 2011, these five countries represented 35% of global energy use (IEO, 2013).

Electricity generation in Brazil relies heavily on hydropower. Over the last three decades, the number of major dams in Brazil has grown steadily and hydropower accounted for 81% of total electricity generation in 2011. Many of Brazil's hydropower generating facilities are located far away from the main demand centres, resulting in high transmission and distribution losses. Droughts in recent years have led to wider diversification in the electricity production mix, also comprising solid bio-fuels (6%), natural gas (5%) and nuclear (3%) among other sources (IEO, 2013).

In Russia, natural gas generates approximately 49% of the electricity. Coal generates 16% and oil only 3%. In January 2009, the Russian government enacted a decree that sets targets to increase the share of electricity generated by renewable energy sources (excluding hydro over 25 MW) from less than 1% to 4.5% by 2020 (IEO, 2013). In April 2013, the government's State Programme targeting renewable energy deployment took a more cautious view on the initial 2020 targets, narrowing the target to 2.5% of electricity generation by 2020 (IEO, 2013).

In 2011 in India, 68% of electricity came from coal, 10% from natural gas and 1% from oil (IEO, 2013). The share of fossil fuels in the generation mix grew from 73% in 1990 to 85% in 2002 and decreased 6% since then (IEO, 2013) owing to the growth of renewable sources (e.g. wind represented 2% of total generation in 2011, and solid bio-fuels 3%). India's renewable power capacity continued its strong growth reaching 23 GW in January 2012, equivalent to nearly 12% of total power capacity, according to more recent estimates (MNRE, 2012; CEA, 2012).

Coal dominates China's electricity generation and, as a result, is responsible for the very fast growth in national CO_2 emissions. In 1978, after many years of Soviet-styled industrialisation, which led to unprecedented poverty levels, leaders in China faced the prospect of another wave of famine (Rosen & Houser, 2007). Beijing let farmers "catch their breath" by relaxing production targets, raising prices and increasing the autonomy of the farming collectives (Rosen & Houser, 2007:6). The dramatic result in the 1980s was that farmers increased their output and rural residents had more time on their hands, cash in their pockets and freedom to choose how to use that extra money (Rosen & Houser, 2007).

However, much of the wealth was invested in township village enterprises (TVEs) targeted at the sector where China would most naturally be productive: labour-intensive, light manufacturing (Rosen & Houser, 2007). These TVEs became an engine of economic growth and the opening salvo in the sector shift away from energy-intensive industry that shaped China's energy footprint for the next 20 years (Rosen & Houser, 2007). Coal played a major role in supporting the growing demand for electricity generation.

Predictions that China will account for 20% of global energy demand by 2030, which is more than Europe and Japan combined, and easily surpasses the United States as the world's largest energy consumer, might well come true (Rosen & Houser, 2007). The annual increase in GDP has lifted some 400 million people out of poverty (The World Bank, 2007). Nearly all of the increase in emissions from power generation between 1990 and 2011 derived from coal, although the emissions performance of coal-fired power generation continued to improve significantly (IEA, 2009).

1.1.3 The status of electricity in Africa

An analysis of Africa's energy needs by the World Bank highlighted a huge deficiency of electrical energy (World Bank, 2007). The reason was that energy consumption grew four times faster than predicted to over 15% of global demand since 2006 (World Bank, 2007). According to the International Renewable Energy Agency (IRENA), Africa currently has 147 GW of installed capacity, a level comparable with the capacity China installs in one or two years (ABREC, 2014). Average per capita electricity consumption in Sub-Saharan Africa (excluding South Africa), is 153 kWh per year.

The average per capita electricity consumption in RSA is one fourth of the consumption in India and just 6% of the global average. Nearly 600 million people in Africa lack access to electricity (2014). Electricity blackouts occur on a daily basis in many African countries. Faced with this situation, people and enterprises often have to rely on expensive diesel power generation to meet their electricity needs, costing some African economies between 1% and 5% of GDP annually (IRENA, 2012).

The demand for electricity supply is a fundamental constraint on development in many parts of Africa. Some of the consequences of the constant break in the supply of electricity are a lack of access to modern energy services (especially in rural areas), poor infrastructure, low purchasing power, low investments and over-dependence on traditional biomass to meet basic energy needs (UNIDO, 2009).

Access to energy is severely constrained in Sub-Saharan Africa, with an estimated 51% of urban populations and only about 8% of rural populations having access to electricity (IEA, 2002). Sub-Saharan Africa compares poorly with about 99% of urban populations and about 80% of rural populations who have access in Northern Africa (IEA, 2002). Other exceptions also include South Africa, Ghana and Mauritius (IEA 2002). Extreme poverty and the lack of access to other fuels mean that 80% of the overall African population relies primarily on biomass to meet its residential needs, with biomass supplying more than 80% of the energy consumed in Sub-Saharan Africa (Hall & Scrase, 2005).

In Kenya, Tanzania, Mozambique and Zambia, for example, nearly all rural households use wood for cooking and over 90% of urban households use charcoal (IEA, 2002; van Jaarsveld, 2005). Dependence on biomass can result in depletion of vegetation. The absence of efficient and affordable energy services can also have a number of other consequences such as health effects associated with the carrying of fuel wood, indoor pollution, and other hazards such as informal settlement fires (IEA, 2002). Further challenges resulting from urbanisation, rising energy demands and volatile oil prices further compound energy issues in Africa (ESMAP, 2005).

South Africa, which was the last to join the BRICS group, currently relies heavily on fossil fuels, mainly coal, as a primary energy source (88% in 2011). Although South

Africa accounted for 38% of CO_2 emissions from fuel combustion across all of Africa in 2011, the country represented only 1% of the global total. Coal dominates the South African energy system, accounting for 70% of primary energy supply and 23% of final energy consumption. In 2011, South Africa generated 94% of its electricity using coal (IEA OECD, 2013).

1.1.4 The Status of Electricity in South Africa

Although better off in terms of development, RSA also has major challenges with regard to providing a sufficient and stable electricity supply. The constant break in electricity supply was exacerbated by the steady economic growth of the country post 1994 and the advent of democracy. In the 2001 Mid-Term Report to the Nation, the government stated that, since 1994, ESCOM made 3.48 million connections to the electricity grid (State of the Nation Address, 2003).

Coal-fired power stations produce the bulk of electricity in RSA (Winkler, 2006). The International Energy Agency says that coal still ranks as the world’s largest source of electricity, accounting for almost 40% of global electricity production. The reason for the use of coal is because it is so abundant, widely distributed across the globe and affordable (WEC, 2013). As a result, coal has been the fastest growing global energy source. The downside is, of course, that coal is the greatest contributor to global greenhouse gas emissions. Greenpeace claims that, as a result, according to the Carbon Monitoring for Action (CARMA) database, ESCOM was the second largest power utility emitter of CO_2 globally in 2007 (Grant, 2007).

Greenpeace suggests that, by building Medupi and Kusile Power Stations, ESCOM and the South African Government have committed to increase South Africa’s annual emissions significantly and contribute to climate change and substantial health, coal mining, and water usage consequences. Kusile alone will generate an estimated 37 million tonnes of carbon dioxide equivalent emissions annually, increasing the country’s total contribution to climate change by an immense 10% (Greenpeace, 2012).

The adverse effect of more coal-powered power stations producing more and more greenhouse gas effectively means that there is a serious need to explore cleaner energy sources. The viability of electricity generated by renewable energy, prompted the South African Government to review its stance on Independent Power Producers (IPPs). Solar and wind generated electrical energy, funded and produced by IPPs, became a reality. According to the South African Government's Integrated Resource Plan for Electricity Version 2 (IRP2) 2010-2030, by not specifically categorising the renewable technologies after 2020, a window was provided for government to direct alternative renewable technology development to meet government objectives (IRP2, 2010).

The decision to allow renewable energy technology into RSA resulted in IPPs introducing a number of large renewable energy projects throughout the country (IRP2, 2010). As part of the implementation agreement (IA) between the Department of Energy (DoE) and the IPPs utility-scale, renewable energy facilities must invest a percentage of their revenue in socio-economic development (SED) and, in some cases, enterprise development (ED) in the areas surrounding the facilities. The IPPs are also accountable for how the funds they allocate to NGO, NPO and charitable projects are used to develop the beneficiary communities.

In addition, shares in the wind farm project company are allocated to the local communities within a 50km radius of the facility. Either a community trust or a non-profit company would represent the community shareholding. The revenue percentage and dividends from the shares in the wind farms are to benefit the local economies and residents over the full lifetime of the farms: for 20-years towards 2035 (Tait, Wlokas & Garside, 2013a). The amounts invested will be substantial and so will the development of initiatives to capitalise on these benefits.

In 2014, the combined SED and ED contribution that will be made over the next 20 years exceeds fifty billion rand (SAWEA, 2014). In comparison with international trends, this amount is regarded as extremely impressive (Tait *et al.*, 2013). The penalties in the implementation agreement for not spending the SED and ED money on these communities are quite severe and may lead to licences for operating a renewable energy facility being withdrawn by the DoE and the renewable energy facilities being shut down (Tait, Wlokas & Garside, 2013).

Shareholding by communities within a 50km radius of the renewable energy sites ranges between 2.5% and 40% of shareholding to legal entities representing local communities (Tait, Wlokas & Garside, 2013). The dividends declared by the renewable energy company each year must be invested in local economic development projects and programmes. The dividends and agreed percentage of revenue will be released once the renewable energy facility starts to generate profit, which can take up to 10 years, depending on energy generated and the initial cost of development.

Although the revenue for beneficiary communities presents an enormous opportunity to develop these communities over the next twenty years towards 2035, not much thought has been given to how IPPs will manage the revenue and projects for the beneficiary communities over the next 20 years, especially considering that community development is not their core business (Tait, Wlokas & Garside, 2013).

Despite the relative importance of the obligations that the IPPs have to the DoE, there is very little empirical evidence in renewable energy literature on how IPPs should manage the revenue and development projects for beneficiary communities over the twenty-year lifespan of the renewable energy facility. This research effort addresses this limitation by identifying the factors that influence the successful management of revenue for beneficiary communities of renewable energy companies in the Republic of South Africa. Identifying these factors will enable IPPs to make progress in the effective management of revenue for the development of beneficiary communities by renewable energy companies South Africa. It will also ensure not only that the IPPs meet the obligations to the DoE as set out in the implementation agreement, but also that the available funds are used to make a significant difference in alleviating poverty and unemployment in the Republic of South Africa.

The theoretical rationale for the research proposal is depicted graphically in figure 1.3 below.

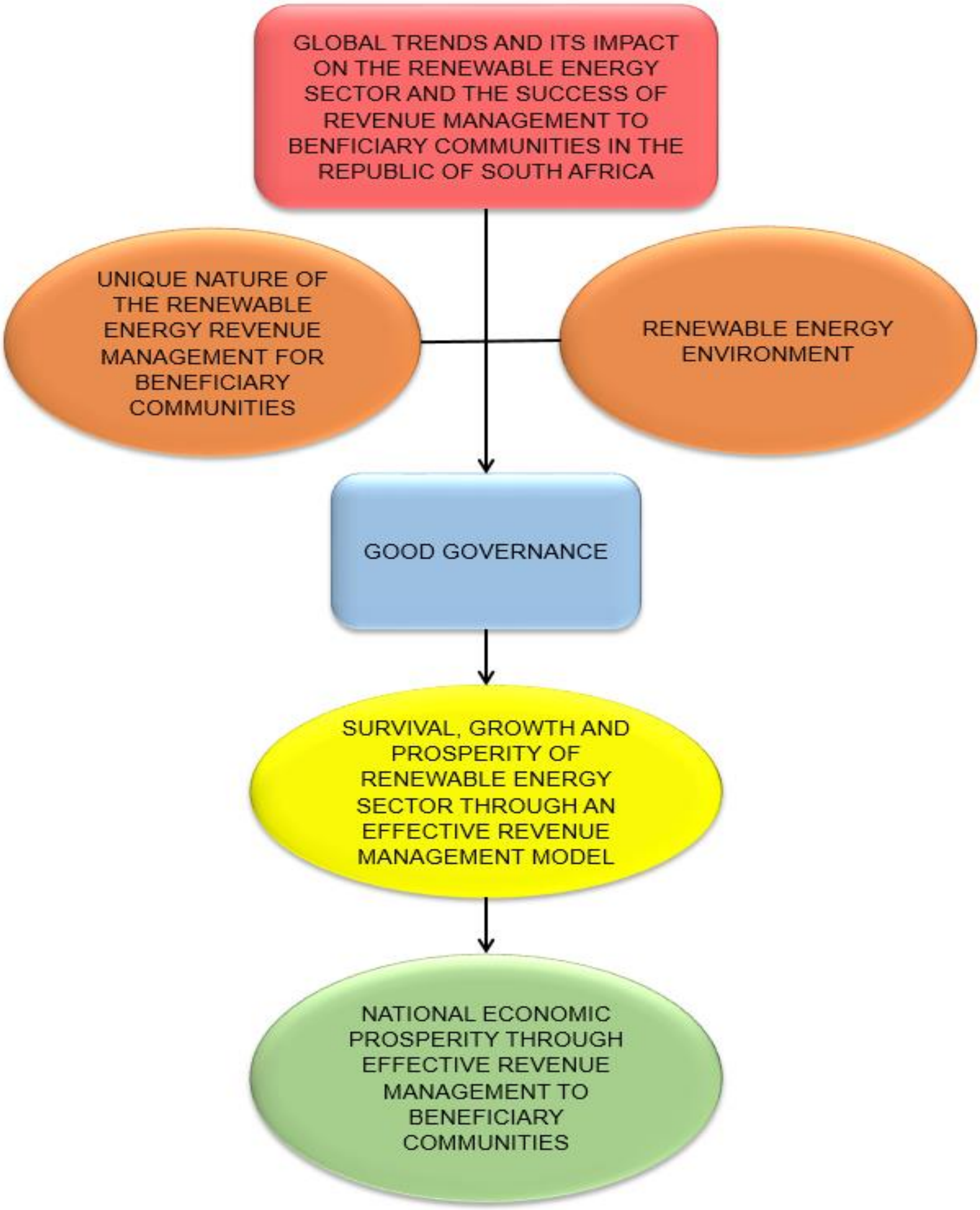


Figure 1.3: Theoretical Rationale for the research proposal

1.2 The Research Problem

The research problem was to investigate the factors that influence the success of revenue management solutions for the RE sector in RSA and, subsequently, to develop a theoretical business process model for perceived success in managing revenue for the beneficiary communities of renewable energy companies in South Africa.

In order to address the research problem, empirical research was conducted to test the proposed process model using statistical benchmarking of various, critical, cross-field skills, concepts and frameworks.

Furthermore, the research critically evaluates and defines the outcomes of completed projects based on recorded statistics benchmarked against the model developed by the research. The aim of the research is to evolve a proposed model that will guide and facilitate the intended results of the revenue management process and the sustainable future success of the model.

The “Sustainable Energy for All” campaign was an initiative launched by Mr Ban Ki-moon, Secretary General of the United Nations in September 2011. It marked a new approach of creating solutions from the bottom up, where implementation does not have to wait forever for political unanimity in a world where many other priorities erroneously appear to be more urgent and pressing (Van der Berg, 2014). However, there is currently very little public discourse about what effect the accrued revenues will have on beneficiary communities over the next twenty years towards 2035, or about how the revenue will be managed.

According to Van der Berg (2014), wind power and its sister renewable energy projects in South Africa will unlock rural development and socio-economic upliftment on a scale that is almost certainly unmatched by anything the private sector has achieved or attempted in the country ever before. The allocated portions of revenue will be available for:

- Socio-Economic Development (SED)

  The final BEE codes define SED as a monetary or non-monetary contribution actually implemented in favour of beneficiaries with special emphasis on facilitating sustainable access to the economy for these beneficiaries. There must be clear visibility of the black beneficiaries who make up 75% of the total beneficiaries of the programme.
- Enterprise Development (ED)

  The difference in focus between ED and SED is that of job creation. The Enterprise Development Element of the Generic Scorecard aims to address certain key challenges facing qualifying small enterprise and exempted micro-enterprises and, more specifically, black-owned business entities that struggle to take their business from survivalist and/or micro level to a level of sustainability and profitability.

1.2.1 The Challenge of the 50km Radius Obligation in RSA

In terms of the IA between the South African Government and IPPs, communities within a 50km radius of a renewable energy facility must benefit directly from the revenues generated through the sale of electricity to ESCOM in the form of SED, and/or ED projects and programmes as well as share dividends (Tait *et al.*, 2013a). The challenges arising from this requirement include the following:

- The identified communities within a 50km radius of renewable energy facilities often do not coincide with the municipal boundaries established by government;
- Municipal wards just outside the 50km radius of a renewable energy facility, therefore, will not benefit from the renewable energy facility in terms of the obligation to the DoE and will feel disadvantaged (Tait *et al.*, 2013a). On the other hand, some communities might fall within the 50km radius of two, adjoining, renewable energy facilities and receive benefits from both facilities while other communities within the same municipal area will not receive any benefits;

- Though communities within the 50 km radius are shareholders in the renewable energy facility, a third party has funded their shares. Only once the third party funder has been repaid with interest, will the full benefit of the shares be realised by the beneficiary communities (Tait, Wlokas & Garside, 2013);
- Benefits to the communities will only be available once the proposal to build a renewable energy facility has been granted and the facility has been financed and built. The time taken between the approval of the bid and the first revenue received from the sale of electricity to ESCOM might be quite a few years. The lag time often impedes effective community development planning;
- Community representation as a shareholder may take the form of a community trust or a non-profit company. However, the methods used to establish these community trusts or non-profit companies are often fraught with challenges. Invariably, the elected trustees are often accused of not being representative of the community, or of representing their own interest (Tait, Wlokas & Garside, 2013).

Many of the communities surrounding the wind farms are impoverished with very high unemployment levels. The beneficiary communities have been living under these conditions for a very long time. The notion that these beneficiary communities will have access to millions of rand over the next twenty years towards 2035 is a foreign concept to these communities and extremely difficult to comprehend. This difficulty hinders the identification of projects that will add value to the communities in the long term and assist in breaking the poverty cycle.

The scale of potential SED and ED funding that the renewable energy sector will generate over the twenty-year lifespan of the facility through the sale of electricity to the Electricity Supply Commission (ESCOM), is phenomenally high. The importance of the renewable energy programme as part of the macro-economy is elevated and it is therefore crucial to examine how the revenue for beneficiary communities will be managed. Against the background described, the main problem investigated in this research was:

To identify the organisational and social variables that will ensure the promotion and sustainability of a model for successful management of revenue for the beneficiary communities of renewable energy companies in South Africa.

1.3 Research Objectives

1.3.1 Primary Research Objectives

The outcome of this research is to develop a model that can be applied so that renewable energy IPPs can meet their obligations as stipulated in the IA with the DoE and the allocated revenue can be managed successfully to benefit the beneficiary communities over the next twenty years towards 2035. In order to achieve the desirable outcomes that will change communities for the better, projects that address immediate, medium- and long-term needs will need to be incorporated into the SED and ED plan.

These projects must include sustainable and legacy projects that will outlive the twenty-year life expectancy of the renewable energy facility. The model will also need to take into account local government's Integrated Development Plan, the Nation Development Plan and the Millennium Development Goals in South Africa. Furthermore, the proposed model must create a workable synergy amongst IPPs in the same region so that projects and programmes can be co-ordinated to maximise their impact on the broader communities and South Africa as a whole.

The primary research objectives to achieve the desired outcome are summarised in Table 1.2:

Table 1.2: Primary research objectives	
PRO_1	To analyse the existing global guidelines governing revenue management theories.
PRO_2	To analyse existing best practices employed by global professionals in socio-economic and enterprise development consultancies.
PRO_3	To evaluate the synergies between existing guidelines and procedures related to modelling revenue management for beneficiary communities in RSA.
PRO_4	To identify the factors (variables) that will ensure the promotion and sustainability of a model for successful management of revenue for beneficiary communities in RSA.
PRO_5	To develop a conceptual model, propose appropriate hypotheses, and construct a path diagram of relationships between the independent variables and the dependent variable.

1.3.2 Secondary Research Objectives

In order to achieve the primary objectives, the following secondary research objectives were postulated (Table 1.3):

Table 1.3: Secondary research objectives	
SRO_1	To construct a theoretical model that will describe the relationships between the variables.
SRO_2	To develop a measuring instrument that will test the relationships empirically as described in the conceptual model.
SRO_3	To test the conceptual model empirically and suggested hypotheses by sourcing primary data from renewable industry experts and community development practitioners nationally and internationally, and by statistically analysing the sourced data.
SRO_4	To discuss the results and interpretation of the research and make appropriate, meaningful recommendations based on the results of the statistical analysis.

1.4 Research Questions

In order to address the research problem, aim and objectives, the researcher addressed certain investigative questions, including:

Table 1.4: Research questions	
RQ1	What is the influence of external factors such as outside advisers and support services on the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa?
RQ2	What is the influence of community transformational factors such as human development and education on the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa?
RQ3	What is the influence of infrastructure development on the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa?
RQ4	What is the influence of management factors such as change management, financial management and project management on the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa?
RQ5	What is the influence of strategic planning on the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa?
RQ6	What is the influence of strategic partnerships on the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa?
RQ7	What is the influence of good governance on the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa?

1.5 Hypotheses and Conceptual Theoretical Problem

To address the objectives set out above, the following research hypotheses were tested:

H1: There is a positive relationship between the use of specialist outside advice and the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa.

H2: There is a positive relationship between the implementation of strategic financial management measures and the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa.

H3: There is a positive relationship between incorporating change management processes and the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa.

H4: There is a positive relationship between the level of human development and the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa.

H5: There is a positive relationship between the access and level of education and the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa.

H6: There is a positive relationship between the use of support services and the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa.

H7: There is a positive relationship between the extent of strategic planning and the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa.

H8: There is a positive relationship between the development of strategic partnerships and the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa.

H9: There is a positive relationship between infrastructure development projects and the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa.

H10: There is a positive relationship between project management methodologies and the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa.

H11: There is a positive relationship between the use of specialist outside advice and good governance of managing revenue for beneficiary communities of renewable energy companies in South Africa.

H12: There is a positive relationship between the use of strategic financial management measures and good governance of managing revenue for beneficiary communities of renewable energy companies in South Africa.

H13: There is a positive relationship between change management processes and good governance of managing revenue for beneficiary communities of renewable energy companies in South Africa.

H14: There is a positive relationship between the level of human development and good governance of managing revenue for beneficiary communities of renewable energy companies in South Africa.

H15: There is a positive relationship between the access and level of education and good governance of managing revenue for beneficiary communities of renewable energy companies in South Africa.

H16: There is a positive relationship between the use of support services and good governance of managing revenue for beneficiary communities of renewable energy companies in South Africa.

H17: There is a positive relationship between the extent of strategic planning and good governance of managing revenue for beneficiary communities of renewable energy companies in South Africa.

H18: There is a positive relationship between the development of strategic partnerships and good governance of managing revenue for beneficiary communities of renewable energy companies in South Africa.

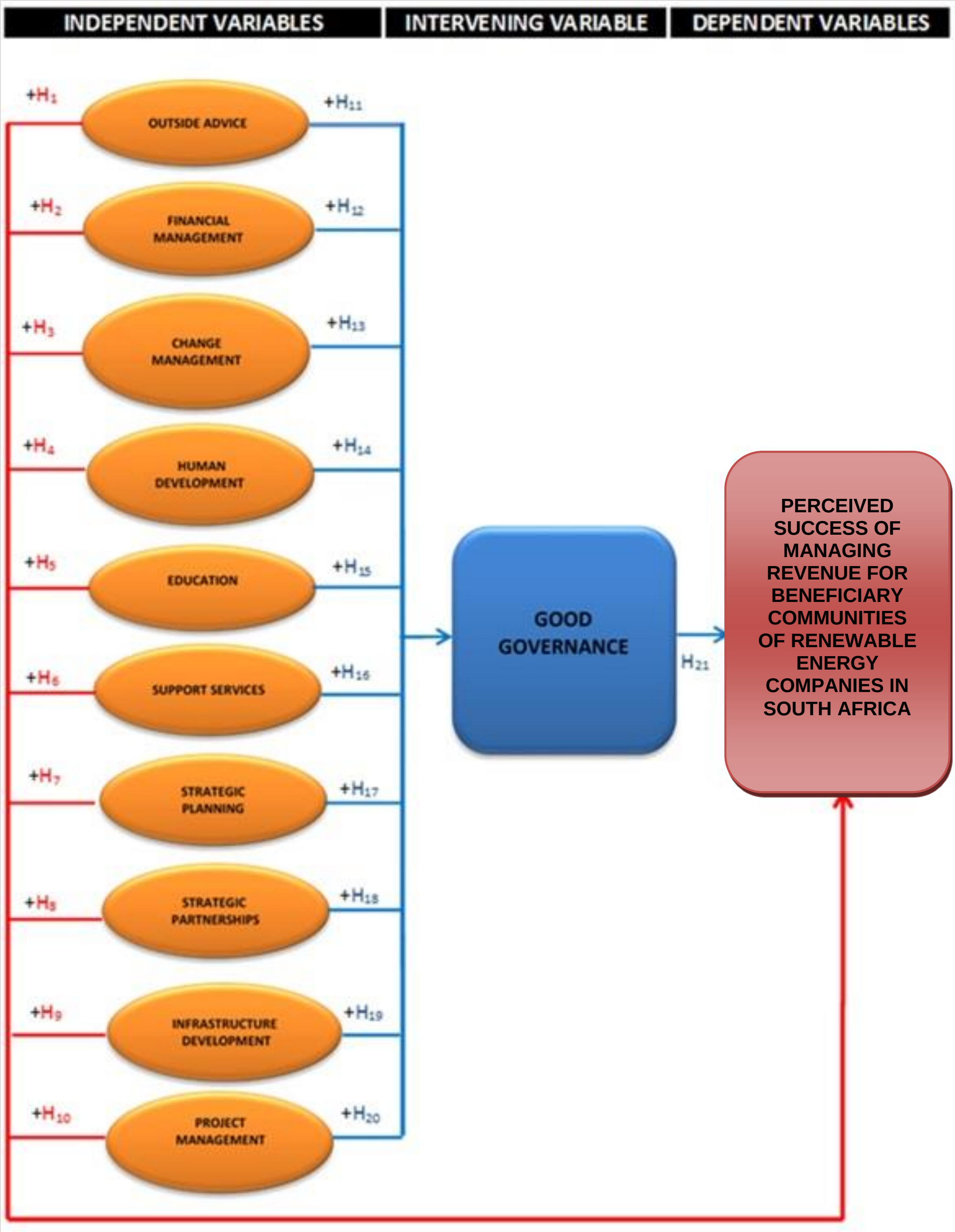
H19: There is a positive relationship between infrastructure development projects and good governance of managing revenue for beneficiary communities of renewable energy companies in South Africa.

H20: There is a positive relationship between the extent of strategic planning and good governance of managing revenue for beneficiary communities of renewable energy companies in South Africa.

H21: There is a positive relationship between good governance structures and the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa.

The path diagram of the proposed theoretical model is shown in Figure 1.4 below.

Figure 1.4: Proposed theoretical model for management of revenue for beneficiary communities of renewable energy companies in South Africa.



The proposed theoretical model was tested empirically among respondents from the renewable energy and community development sectors in RSA.

1.6 Research Design and Methodology

In order to address the objectives of the research and to investigate the propositions, the research strategy was to divide the study into two main components, namely: the primary and secondary research study.

1.6.1 Secondary Research Study

As far as is known, no similar research study that focuses exclusively on revenue management process models for beneficiary communities in the renewable energy sector has been undertaken. A comprehensive literature review was conducted to identify as many factors as possible that could influence the success rate of the renewable energy sector in RSA.

Secondary sources from related subject disciplines such as business management, renewable energy, socio-economics and enterprise development management, sociology, entrepreneurship, organisational psychology, law and anthropology were consulted. International and regional libraries supplied data by means of the internet. Various sources from which to extract databases relating to the research study were used.

1.6.2 Primary Research Study

Based on the literature review, a questionnaire was developed and pre-tested amongst 25 respondents from the renewable energy sector in order to ensure ease of understanding and timely completion. The procedures used in developing the instrument are described in detail in Chapter 5. Informal interviews were conducted with members of the renewable energy sector in order to enhance the reliability and validity of the primary data.

1.7 Sample

In order to achieve an adequate response rate, contact was made with Socio-economic Development (SED) and Enterprise Development (ED) practitioners within the renewable energy sector. Field workers were employed at all the annual conferences and expositions of the various renewable energy types such as the Windaba and Solar Indaba, to identify 250 potential respondents. Data were collected from associations and forums such as the South African Wind Energy Association (SAWEA), the South African Photovoltaic Industry Association (SAPVIA) and the Renewables and Energy Forum South Africa (REFSA). Contact was also made with the Department of Energy's Independent Power Producers office in Johannesburg to identify additional renewable energy companies who have had success with revenue management for beneficiary communities in South Africa. In order to achieve an adequate response rate, field workers were employed in the different regions of South Africa to make direct contact with renewable energy companies. These potential respondents were also requested to identify other renewable energy companies that could be approached to assist with the survey.

1.7.1 Measurement Instrument

A draft questionnaire was developed and worded to address key issues related to managing revenue for the beneficiary communities of renewable energy companies in South Africa (See Appendix B). The instrument was purposefully designed for this research study. In the absence of published items, self-developed items were used.

1.8 Statistical Procedures

In order to identify distinct factors in the data, exploratory factor analysis (EFA) was performed. EFA attempts to bring inter-correlated variables together under more general, underlying variables. More specifically, the goal of factor analysis is to reduce "the dimensionality of the original space and to give an interpretation to the new space, spanned by a reduced number of new dimensions which are supposed to underlie the old ones” (Rietveld & Van Hout, 1993: 254); or “to explain the variance in the observed variables in terms of underlying latent factors” (Habing, 2003: 2) Thus, factor analysis offers not only the possibility of gaining a clear view of the data, but also the possibility of using the output in subsequent analyses (Field, 2000; Rietveld & Van Hout, 1993).

To confirm the reliability of the instrument used, each factor’s Cronbach’s alpha co-efficient was calculated. Structural equation modelling (SEM) was employed to evaluate the relationships among the set of variables identified as influencing the perceived success of managing revenue for beneficiary communities in the renewable energy sector. SEM was used to assess the relationships among the set of variables used in the model proposed in the research study. SEM is a multi-variate technique combining aspects of multiple regression and factor analysis, to estimate a series of inter-related dependence relationships simultaneously (Hair, Black, Babin, Anderson & Tatham, 2006: 711).

1.9 Contribution of the Study

The point of departure of the research study was that the success of managing revenue for beneficiary communities is unique to the renewable energy sector and can be significantly improved if the relationship between the variables can be successfully analysed. The research study investigates how good practitioners can implement revenue management practices for the beneficiary communities in the renewable energy sector. The research also attempted to contribute to the body of knowledge regarding managing revenue for beneficiary communities in the renewable energy sector internationally. Exhaustive searches have confirmed that there is limited research material available about managing revenue for beneficiary communities in the renewable energy sector, even internationally.

1.10 Scope of the Study

From the literature reviewed, several factors were identified that might influence the success of managing revenue for beneficiary communities of renewable energy companies in South Africa. The research study focused specifically on managing revenue for the beneficiary communities in the renewable energy sector, which is an essential obligation IPPs have in their implementation agreement with the Department of Energy in South Africa. Failure to meet the obligation can lead to termination points that in turn can lead to the closing down of the renewable energy facility.

Termination points and potential financial penalties come into consideration if under-spending on community development projects occurs over two quarters measured on a bi-quarterly basis. In the case of under-spending, a rectification plan must be submitted to the IPP Monitoring Office, demonstrating how the under-spending will be corrected. Meeting budgeted Socio Economic Development targets is a priority to avoid accumulating termination points and could result in a wind farm losing its licence to sell energy if the permissible threshold of termination points is breached.

1.11 Definition of Concepts and Terms

1.11.1 Outside Advice

The use of specialist outside advisers is an integral part of successfully managing revenue for beneficiary communities in the renewable energy sector in South Africa. Outside advisers in the form of consultants, lawyers and local government, community development practitioners including social workers, corporate social responsibility specialists and community leaders all play a role in preparing effective engagement with the communities and, therefore, form the basis for a successful revenue management model for beneficiary communities of the renewable energy sector in South Africa. It is important to define and understand the different types of outside advisers because they will support the successful development of a revenue management model for beneficiary communities of the renewable energy sector in South Africa.

Block (2000: 2) defines a consultant as being “a person in a position to have some influence over an individual, a group, or an organization but who has no direct power to make changes or implement programs”. The role of the consultant as a source of outside advice is crucial. When making use of consultants to provide advice, it is important to define clearly what is required and what the consultant is expected to do, and to define the duration and cost of the project (contractual agreement). Consultants bring specialised skills, experience, knowledge, or access to information (Block, 2000). One of the main advantages of contracting the services of a consultant is that the consultant brings an independent and focused perspective to the beneficiary communities.

1.11.2 Financial Management

Sound strategic financial management is important in developing a revenue management model for beneficiary communities of the renewable energy sector in the RSA. Massie (1983) defines strategic financial management as the operational activity of a business that is responsible for obtaining and effectively utilising the funds necessary for efficient operations (Massie, 1983). As part of the implementation agreement between the Department of Energy and the Independent Power Producers (IPPs), a financial model must be in place to ensure that the communities within a 50km radius of the renewable energy facilities benefit from the sale of electricity over the twenty-year life expectancy of the facility. In order to address the immediate, short-, medium- and long-term needs of the communities, an Economic Development Plan (EDP) has to be submitted as part of the bidding process which takes place before construction can begin (DoE, 2011b: 19).

The obligation to provide an initial EDP has subsequently been retracted for new bidders. The renewable energy sector is obligated to contribute actively to economic and social transformation in the country and to enhance opportunities for people previously disadvantaged under apartheid to gain access to the formal economy (Tait, 2012). Contributing to community development is by no means an easy task. To make matters worse, renewable energy companies face severe penalties and even closure of facilities if the money is not spent within the stipulated time frames (Tait, Wlokas & Garside, 2013). These time frames are evaluated every three months (2013). The time restrictions make careful financial planning and management imperative if the IPPs hope to make a meaningful impact on the beneficiary communities (2013).

1.11.3 Change Management

The rules for the disbursement of revenue by renewable energy companies as determined by the Department of Energy is unique in that it stipulates exactly how the revenue will be determined and when and how it should be spent. Many of the captains of industry in the renewable energy sector are new to socio-economic development as defined by the DoE. SED and ED are not core business activities and many renewable energy companies have tried to delegate community development to various departments within the company such as human resources and marketing. These departments lack the experience and skills to deal with the often complex beneficiary communities that must benefit from funds spent on SED and ED. Many stakeholders observed that IPPs might not necessarily have the expertise to manage complex community interactions and relations (Tait, 2013). Furthermore, top-down project implementation is unlikely to solve complex local problems (2013).

Trying to meet the obligations of the DoE has brought about sudden changes in the beneficiary communities who previously relied solely on government for financial assistance. Unless these changes are managed correctly and systematically, it threatens to unbalance and have a negative long-term effect on the socio-economic growth of the beneficiary communities. The practice of simply spending money to meet the DoE obligation without giving real thought to improving the situation in the beneficiary communities is unlikely to change because of the risk to the company of incurring penalties if it fails to meet the obligations to the DoE.

In addition, the constant stream of revenue that will flow into beneficiary communities is new to them, particularly in rural areas. The novelty is further increased by the fact that the beneficiary communities are also shareholders in the renewable energy facilities through a community trust or local community company. Furthermore, some beneficiary communities fall within the geographic radius of the SED and ED obligations of multiple renewable energy facilities and this means that an even larger amount of revenue flows into those communities. It is, therefore, very daunting when communities are made aware of the fact that they will be receiving hundreds of millions of rand over the 20-year lifespan of a renewable energy facility.

The lack of empirical evidence on change management in beneficiary communities within the renewable energy sector has added further motivation to this research.

1.11.4 Human Development

Human development can be described as being the ability of human beings to understand their own needs and their ability to develop resources and opportunities to satisfy those needs. The Arab Human Development Report (AHDR, 2002) defines human development as a process of expanding choices. Every day human beings make a series of choices – some economic, some social, some political, some cultural (Munene, 2014). Human development seeks not only to increase capabilities and opportunities but also to ensure an appropriate balance between the two in order to avoid the frustration that a mismatch between the two can create (AHDR, 2002).

Recent United Nations documents emphasise that “human development” is measured by life expectancy, adult literacy, access to all three levels of education, as well as people’s average income that is a necessary condition to their freedom of choice. In a broader sense, the notion of human development incorporates all aspects of individuals' well-being, from their health status to their economic and political freedom. According to the Human Development Report 1996, published by the United Nations Development Programme, "human development is the end – economic growth a means" (UNDP, 1996). Given the overall obligation that the renewable energy sector has to beneficiary communities, human development is an important element of this research.

In 2009, the UNDP reported that South Africa's human development index (HDI) rose from 0.658 to 0.683 between 1980 and 2007. South Africa falls into the medium human development category with a ranking of 128 out of 182 countries (HDR, 2009). According to (Gumede, 2010), the black population group has the lowest HDI at 0.63, compared to that of whites at 0.91 (Gumede, 2010). This further emphasises that human development is an important element to consider when developing a model for managing revenue for beneficiary communities of the renewable energy sector in South Africa.

This research also takes in account human development in the context of development theory with a special focus on the capability approach. Poverty is understood as capability-deprivation (SEN, 2000). It is noteworthy that the emphasis is not only on how humans actually function but also on their having the capability, which is a practical choice, "to achieve outcomes that they value and have reason to value" (SEN, 2000: 291). This research critically discusses the strengths and weakness of Capability Theory with a special focus on beneficiary communities of the renewable energy sector in South Africa.

1.11.5 Education

There are a number of educational elements that must be considered when developing a model for managing revenue for beneficiary communities of the renewable energy sector in South Africa. For example, it is important to understand the communities with which the sector will be engaging and the recipients of the benefits. The beneficiary communities are often vulnerable and fragile because of poverty, inequality and unemployment. The renewable energy sector should be informed about the best methodology to follow when engaging with these communities to ensure that outcomes are positive and meaningful.

In their publication on education for rural development, Atchoarena and Gasperini (2003) argue that one of the major inequalities affecting the rural poor is their access to quality education, which is so important for social and economic development (Atchoarena & Gasperini, 2003). Atchoarena and Gasperini (2003) argue further that urbanisation will not solve the problem and, in fact, anticipate that over 60% of the poor will continue to live in rural areas of developing countries in 2025.

Rural poverty and illiteracy are not just problems of transition or a crisis of adjustment in a process of modernisation; there are structural development challenges. Given the fact that the vast majority of the beneficiary communities are situated in rural communities, the benefits of education must be included in this research study on developing a model for managing revenue for beneficiary communities of the renewable energy sector in RSA (Stellenbosch Local Municipality, 2015).

1.11.6 Support Services

There are a number of service providers that can be engaged to ensure revenue management for beneficiary communities is successful. The renewable energy sector is still relatively new in South Africa and many service providers have suddenly sprung up, offering services specific to the renewable energy sector. The uniqueness of the renewable energy sector is determined by its obligations to the Department of Energy, which are included in the implementation agreement. A careful study of the type of support services is necessary to ensure that the correct support services are employed to deliver the required outcomes in the beneficiary communities. Support services can include the following:

- Enterprise development advisory and reporting services;

- Accounting services;
- Asset mapping and needs analysis services;
- Environmental impact service;
- Non-profit organisations;
- Community based organisations;
- Trusts and non-profit companies.

One of the key services that a specialist supporting service provider can provide is the asset mapping and needs analysis (AMNA) of communities. An analysis of the data that is collected through the AMNA process will provide insight into the present conditions in the communities and what kind of approach or action is required to make a significantly positive impact.

Given the inequalities that existed in RSA prior to 1994, when the country became a democracy, a significantly uneven distribution of assets and resources in many impoverished communities still remains. Inequality has had a direct impact on the needs of the communities and, therefore, receiving outside advice from a service provider that specialises in AMNA is crucial to developing a model for managing revenue for beneficiary communities of the renewable energy sector in South Africa.
Of particular importance is the use of outside advice from community development practitioners such as social workers, corporate social responsibility specialists and community leaders in order to achieve successful revenue management for beneficiary communities.

1.11.7 Strategic Planning

The Business Dictionary (March 2015) defines strategic planning as a systematic process of envisioning a desired future, and translating the vision into broadly defined goals or objectives and a sequence of practical steps. In contrast to long-term planning (which begins with the current status and lays down a path to meet estimated future needs); strategic planning begins with the desired-end and works backward to the current status (Black, 2009). In developing a model for managing revenue for beneficiary communities of the renewable energy sector in South Africa, the need for strategic planning as a key element cannot be over-emphasised. By deconstructing the business dictionary's definition, the following elements were identified as being important and concomitant with developing the model.

1.11.7.1 Systematic Processes

In terms of the implementation agreement with the DoE, beneficiary communities will receive benefits for twenty years towards 2035. Therefore, the strategic planning must incorporate scientific research involving a systematic process that focuses on being objective and gathering plenty of information for analysis so that the researcher can reach a conclusion (Blankenship, 2010). The model for managing revenue for beneficiary communities in the renewable energy sector was tested and replicated throughout the sector.

1.11.7.2 Envisioning a Desired Future

In order for the strategic plan to be successful, there must be a vision of what the beneficiary communities will look like in 2035. What must the model for managing revenue for beneficiary communities of the renewable energy sector in RSA achieve by 2035? The model should address the challenges that many of these communities face presently such as poverty, unemployment, inequality, lack of education and marketable skills. The model should also offer a sustainable future that is significantly different from the present.

The historical oppression responsible for the condition of rural communities today has been both traumatic and violent at times. Traumatised communities struggle to envision a better future. Corbett (2005) asserts that many communities struggle to pursue a vision of reform that is difficult to define. This research study will analyse a number of approaches in order to guide the community towards a future that the community can own and be motivated to achieve. Helping communities to identify goals that are realistic, practical and measurable is fundamental to any revenue management model for beneficiary communities. Distressed and impoverished communities often expect immediate results. Therefore, the goals must not only be achievable but composed in such a way that some goals are achievable in the short term. This research study explored various methodologies that guide communities to identify goals that will add value to a model for managing revenue for beneficiary communities of the renewable energy sector in RSA.

1.11.8 Requirements for Strategic Partnerships

Identifying, developing and maintaining strategic partnerships are essential components of the model for managing revenue for beneficiary communities of the renewable energy sector in RSA. The list of potential partnerships is varied and multi-dimensional. The partnerships include local government, community-based organisations, other renewable energy companies, non-profit companies, and other trusts to name a few. The research study provides the following basic requirements to which to adhere in order to develop a model for managing revenue successfully for beneficiary communities of the renewable energy sector in South Africa:

- Clearly define the need for strategic partnerships. What is it about the context and environment of the beneficiary communities that warrants the use of strategic partners?
- Identify the types of partnerships that will add value to the model so that the management of revenue can be used effectively within the beneficiary communities.
- Clearly define the scope of work that each partner should bring to the partnership. The scope must be seen in the context of the entire project. The scope will be qualified by timelines in some cases but, where the partner is the beneficiary community, the scope must be long term. This research study provides a methodology for defining the scope of each partner.
- Determine how the strategic partnership will be maintained throughout the length of the partnership contract and or length of the project.
- Determine how the partnership will be monitored and evaluated.

The partnership concept rests on the notion that performance can be improved significantly through joint, mutually dependent action (Henderson, 1990).

1.11.9 Infrastructure Development

The Oxford Dictionary of Economics (2009) defines infrastructure as the capital equipment used to produce publicly available services, including transport and telecommunications, and gas, electricity and water supplies. Infrastructure development provides the essential framework for other economic activities in modern economies; the fact that infrastructure development is not available or reliable is a characteristic of less developed countries (LDCs), and handicaps the development of LDCs. Infrastructure services generally are either provided or regulated by the state.

The tumultuous history of apartheid in South Africa had a dramatic influence on infrastructure in rural areas and 20 years of democratic government has not been able to address the deficiencies in infrastructure, especially in rural areas. The recent and on-going spate of service delivery protests has once again highlighted the deficiencies in infrastructure. In order to develop a successful model for managing revenue for beneficiary communities in the renewable energy sector in RSA, infrastructure development, as described in the definition above, must be addressed. This research study proposes methods of identifying and analysing existing infrastructure; strengthening and adding value to existing infrastructure; identifying the need for new types of infrastructure; engaging with local government and the Integrated Development Plan (IDP); maintenance and evaluation of infrastructure over the period of the project until 2035.

Although there have been improvements in infrastructure development in South Africa, there are still challenges that must be addressed before the country can reach its infrastructure goals. Some of the challenges include funding of infrastructure projects, slow approval processes for projects, and skills shortages in carrying out the actual work. However, there are also opportunities in investing and developing infrastructure, namely: job creation, social development, economic efficiency and skills development (Gauteng Province Provincial Treasury, 2012).

A concept that has gained popularity in South Africa in recent years is Public Private Partnerships (PPPs). The South African National Treasury (SANT) PPP Unit, in its publication on Introducing Public Private Partnerships in South Africa, defines PPPs as long-term contracts between the public and private sector. The main objective of PPPs all over the world is to ensure the delivery of well-maintained, cost-effective public infrastructure or services, by leveraging private sector expertise and transferring risk to the private sector.

The unique relationship between the renewable energy sector, government and the community must be approached with caution. This research study proposes ways of forming PPPs that will add value to the model for managing revenue for beneficiary communities in the renewable energy sector in South Africa.

1.11.10 Project Management

Project management is a methodical approach to planning and guiding project processes from start to finish. According to the Project Management Institute (PMI), and Body of Knowledge (PMBOK), the processes are guided through five stages: initiating, planning, executing, controlling, and closing (PMBOK, 2000). PMI (2000) further defines project management as the application of knowledge, skills and techniques to execute projects effectively and efficiently. It is a strategic competence for organisations, enabling them to link the project results to business goals and thus compete in their markets better. The five stages of the PMI process form the basis of this research study to develop a model for managing revenue for beneficiary communities in the renewable energy sector in South Africa. Successful project management is the art of bringing together the tasks, resources and people necessary to accomplish business goals and objectives within the specified time constraints and within the monetary allowance (City of Chandler, 2010).

The Project Management Institute divides the planning process into a number of systematic steps that ensure that every aspect of the planning process is covered (PMBOK, 2000). The researcher modified these steps to focus specifically on managing revenue for the beneficiary communities in the renewable energy sector. The following steps were included:

- Scope planning
- Resource planning
- Time planning
- Quality planning
- Organisational planning
- Communications planning
- Risk planning
- Procurement planning

One of the challenges presented by the beneficiary communities in the renewable energy sector is that these communities have been in survival mode for a long time and have been able to survive on minimal resources. Therefore, many of the beneficiary interventions in these beneficiary communities must address a desperate and immediate need rather than a medium- to long-term sustainable solution. Planning must take place on multiple levels and address the different facets of the communities' needs while staying true to the vision of what the beneficiary community will look like in 2035.

1.11.11 Good governance

Corporate governance is a system of procedures and rules laid down by a company for its efficient and ethical functioning to achieve its mission, conforming to public policy and law of government and also conforming to the acceptable, ethical standards of the society, resulting in equitable and just distribution/delivery of its benefits to all stakeholders and also to the society at large (Colley, 2004).

Much of the contemporary interest in corporate governance is concerned with mitigation of conflicts of interest between stakeholders. Ways of mitigating or preventing these conflicts of interest include the processes, customs, policies, laws, and institutions, which have an impact on the way a company is controlled. An important theme of governance is the nature and extent of corporate accountability (Colley, 2004). Good governance has also been covered extensively by the King Commissions Report of the last few years (King 3, 2012). The philosophy of the code is based on three key elements of leadership, sustainability and good corporate citizenship (2012). The code views good governance essentially as being effective, ethical leadership.

King (2012) believes that leaders should direct the company to achieve sustainable economic, social and environmental performance. The King Reports (2012) emphasise sustainability as the primary moral and economic imperative of the century. The code's view on corporate citizenship flows from a company's standing as a juristic person under the South African constitution that should operate in a sustainable manner The application of sound governance principles to managing revenue for beneficiary communities in the renewable energy sector in RSA addresses issues of the mismanagement and misappropriation of funding in the short-, medium- and long-term as well as deterring incidences of fraud and corruption.

1.12 Delineation of the Research

The research was conducted within the following parameters:

- The research was limited to the field of global and regional generation of electrical power by renewable energy;
- The geographical scope of the study was the Republic of South Africa;
- Renewable energy and related sectors were investigated with a special focus on economic development;

- The targeted sample population was limited to experts in the renewable energy industry including community development practitioners, researchers and scholars.

1.13 Assumptions

The following assumptions were made for the purpose of this research:

- Universal principles of revenue management will apply to the renewable energy sector in South Africa;
- The current government and institutional framework in the renewable energy sector in the Republic of South Africa will remain constant for the duration of the study;
- Market and economic conditions will remain constant for the duration of the study.

1.14 Structure of the Thesis

The research study has been organised into the following seven chapters.

Chapter 1: Introduction, Problem Statement and Scope of the Study:
Chapter 1 contains an overview of the situation in the Renewable Energy Sector in South Africa that gave rise to this research, and a brief discussion of the research approach used to address the problem.

Chapter 2: Renewable Energy Sector
Chapter 2 contains a review of relevant literature and discusses the renewable energy sector in the world, the BRICS countries and Africa. More specifically, the researcher focuses on the renewable energy sector in RSA and provides insight into the unique obligations that the renewable energy sector has to the beneficiary

communities as determined by the DoE. The researcher assesses the energy sector's ability to meet these obligations.

Chapter 3: Revenue Management

Chapter 3 contains a review of revenue management systems used worldwide and specifically those aimed at socio-economic and enterprise development. International approaches to managing revenue for beneficiary communities are considered. More specifically, Chapter 3 includes a review of revenue management for beneficiary communities in the renewable energy sector in RSA. Key concepts regarding the management of revenue for beneficiary communities in the renewable energy sector in the RSA are discussed as well as their impact over the 20-year lifespan of a renewable energy facility towards 2035.

Chapter 4: Proposed Theoretical Model Formulation

In Chapter 4, the researcher presents the proposed theoretical model of perceived success in managing revenue for the beneficiary communities in the renewable energy sector in RSA. The independent, intervening and dependent variables that were thought to influence the effective management of revenue for beneficiary communities are discussed together with their hypothesised relationships.

Chapter 5: Research methodology

The focus of Chapter 5 is on the research design and methodology that were selected to address the research problem. Chapter 5 includes a description of the sector of the population studied, the method of data collection, the sampling technique and the design and administration of the questionnaire survey. The chapter also includes details about the nature of the measuring instrument and the SEM statistical analysis that was performed.

Chapter 6: Data Analysis

Chapter 6 contains a report on the empirical results and the reliability and validity assessments of the measurement instruments used in the research study. The chapter also contains the results of the empirical assessments of the various factors affecting the perceived success of managing revenue for beneficiary communities in the renewable energy sector in RSA.

Chapter 7: Summary and Recommendations

Chapter 7 contains a summary of the research effort, which includes some conclusions and limitations of the study. The chapter concludes with specific managerial recommendations to ensure the effectiveness of managing revenue for beneficiary communities in the renewable energy sector in RSA. The chapter addresses the research questions and research objective of the study discussed in the first chapter.

Chapter 2
Literature Review: Renewable Energy Sector

2.1 Introduction

Given the recent introduction and rapid growth of renewable energy in the world as well as its potential effect on beneficiary communities, the lack of empirical evidence on the management of revenue for beneficiary communities presents a unique gap in the literature about beneficiary revenue management. This chapter contains a discussion of the renewable energy sector in the world, the BRICS countries and Africa. More specifically, the focus of the study is on the renewable energy sector in RSA in order to gain insight into the unique obligations that the renewable energy sector has to the beneficiary communities as determined by the Department of Energy (DoE). The research study addresses the challenges that these obligations pose. Having identified and analysed the challenges of the renewable energy sector, it was possible to proceed to develop a theoretical model for managing revenue effectively for beneficiary communities of renewable energy companies in South Africa. The research makes a critically important contribution to the economy of South Africa and addresses some of the societal challenges the country faces.

There are a number of factors that determine the type and spread of renewable energy throughout the world and it is important to grasp the full definition of renewable energy. According to the International Energy Agency (IEA, 2002), renewable energy is derived from natural processes that are replenished constantly. In its various forms, it is derived directly from the sun, or from heat generated deep within the earth. Included in the definition are electricity and heat generated from solar, wind, ocean, hydro-power, biomass, geo-thermal resources, as well as bio-fuels and hydrogen derived from renewable resources (IEA, 2002). However, for the purpose of this thesis, the focus is specifically on power generation and heating which has shown significant growth globally. Although the researcher reviews other sources of renewable energy, the focus on power generation and heat further limits the research to the use of wind and solar energy, which are the most widespread and most viable forms of renewable energy.

2.2 Alternative Sources of Energy

In 2011, policymakers at the Inter-governmental Panel on Climate Change, an organisation established by the World Meteorological Organisation (WMO) and the United Nations Environment Programme (UNEP), commented that, if implemented properly, renewable energy sources can contribute to: social and economic development; energy access; a secure and sustainable energy supply; and a reduction in the negative effects of energy provision on the environment and human health (Edenhofer, Pichs-Madruga, *et al.,* 2011). Renewable energy, obtained by using low-carbon energy methods, is acknowledged as a solution to energy poverty and climate change around the world (UNEP, 2011). At the DOHO 2012 Climate Change Conference, the United Nations called upon world leaders to adopt universal access to modern energy services by 2030 as a critical long-term priority and a catalyst that can be attained by investing in renewable energy, particularly in developing counties (United Nations, 2012). The UN General Assembly unanimously declared the decade 2014 - 2024 as the Decade of Sustainable Energy for All, underscoring the importance of energy issues for sustainable development and for the elaboration of the post-2015 development agenda (Ren21, 2014).

2.2.1 Solar Energy

Energy from the sun can be used to produce electricity in two ways: by means of photovoltaic systems and systems using thermal energy. Solar energy is the most abundant energy resource and it is available for use in its direct (solar radiation) and indirect (wind, biomass, hydro, ocean etc.) forms. About 60% of the total energy emitted by the sun reaches the Earth’s surface (WEC, 2013). Even if only 0.1% of this energy could be converted at an efficiency rate of 10%, it would be four times larger than the world's total electricity generating capacity of about 5 000GW (WEC, 2013).

2.2.1.1 Solar Photovoltaic (PV) Energy

Photovoltaic, also called PV cells, comes from the words "photo", meaning light, and "volt", a measurement of electricity (The Need Project, 2015). At first, PV cells were used primarily in space to power U.S. space satellites, but PV cells are common in many different applications. These days, PV cells are used in solar-powered toys, calculators, and many lighted roadside signs to convert sunlight into electricity (The Need Project, 2015).

According to the World Energy Council (2013a), the sun emits energy at a rate of 3.8 x 1 023 kW per second. Of this total, only a tiny fraction, approximately 1.8 x 1 014 kW is intercepted by the earth, which is located about 150 million km from the sun. About 60% of the 1.8 x 1 014 kW reaches the surface of the earth. The rest is reflected back into space and absorbed by the atmosphere. The total, annual, solar radiation falling on the earth is more than 7 500 times the world's total, annual, primary energy consumption of 450 EJ (World Energy Council, 2013a).

2.2.1.2 Concentrating Solar Power (CSP) Energy

Concentrating solar power (CSP) systems also use solar energy to make electricity but, instead of using panels alone, they also use a turbine system (The Need Project, 2015). Since the solar radiation that reaches the Earth is so dispersed, it must be concentrated to produce the high temperatures required to generate electricity using a steam turbine (The Need Project, 2015). In Concentrating Solar Power (CSP) plants, mirrors concentrate sunlight and produce heat and steam to generate electricity by means of a conventional thermo-dynamic cycle (IEA-ETSAP & IRENA, 2013). Ground-based fields of mirrors focus direct solar irradiation onto a receiver mounted high on a central tower where the light is captured and converted into heat, which drives a thermo-dynamic cycle which, in most cases, drives a water-steam cycle, to generate electrical power (IRENA, 2012).

CSP plants can be equipped with a heat storage system to generate electricity even under cloudy skies or after sunset, and thermal storage can increase the capacity factor and dispatch ability of CSP significantly compared with PV and wind power. It can also facilitate grid integration and competitiveness (IEA-ETSAP & IRENA, 2013). The CSP technology includes four variants, namely: Parabolic Trough (PT), Fresnel Reflector (FR), Solar Tower (ST) and Solar Dish (SD). In PT and FR plants, mirrors concentrate the sun's rays on a focal line with concentration factors to the order of 60 - 80 and maximum achievable temperatures of about 550°C. In ST and SD plants, mirrors concentrate the sunlight on a single focal point with higher concentration factors (600 - 1 000), and operating temperatures of 800 – 1 000°C (IEA-ETSAP & IRENA, 2013).

2.2.2 Wind Energy

Wind energy represents the fastest growing technology today in the energy production sector globally and, of the low-carbon energy generation technologies, wind has emerged as the top technology of choice. Investors are becoming increasingly comfortable in backing wind investments (World Energy Council, 2013a). Wind power is characterised by converting wind energy into a useful form, such as using wind turbines to make electricity, windmills for mechanical power, wind pumps for pumping water or drainage, or sails to propel ships (Ellabban, Abu-Rub & Blaabjerg, 2014). Generating electricity from the wind requires that the kinetic energy of moving air be converted to mechanical and then electrical energy, thus challenging the industry to design cost effective wind turbines and power plants to perform this conversion (Ellabban *et al.*, 2014). To minimise cost, wind turbine design is also motivated by a desire to reduce the use of materials while continuing to increase turbine size, increase component and system reliability, and improve wind-power plant operations (Ellabban *et al.*, 2014).

During 2012, almost 45 GW of wind-power capacity became operational, increasing global wind capacity by 19% to almost 283 GW (Ellabban *et al.*, 2014). Approximately 44 countries added capacity during 2012, of which at least 64 had more than 10MW of reported capacity by year's end and 24 had more than 1 GW in operation (Ellabban *et al.*, 2014). From the end of 2007 through to 2012, annual growth rates of cumulative wind-power capacity averaged 25% with the United States and China together accounting for nearly 60% of the global market in 2012, followed distantly by Germany, India, and the United Kingdom. Others in the top 10 for capacity added were Italy, Spain, Brazil, Canada and Romania (Ellabban *et al.*, 2014).

2.2.3 Hydro-power Energy

Hydro-power is derived from the energy of moving water (Ellabban *et al.*, 2014). Flowing water creates energy that can be captured and converted into electricity by using turbines. The most prevalent form of hydro-power is generated using dams, although newer forms harnessing wave and tidal power are becoming more common (Ellabban *et al.*, 2014). Hydro-power projects are always site-specific as they are designed according to the river system on which they are based (Ellabban *et al.*, 2014). Hydro-power today is an extremely flexible power technology with one of the best conversion efficiencies of all energy sources (90%, water to wire), because of its direct transformation of hydraulic energy to electricity (Ellabban *et al.*, 2014). Five countries produce more than half of the world's hydro-power: China, Brazil, Canada, USA and Russia (Ellabban *et al.*, 2014).

Hydro-power plants are classified into three categories according to operation and type of water flow: Run-of-river (RoR), storage (reservoir), and pumped storage. Hydro-power plants (HPPs) vary from small to large in terms of scale, depending on the hydrology and topography of the watershed (Ellabban *et al.*, 2014). An RoR HPP draws the energy to produce electricity mainly from the available flow of the river (Ellabban *et al.*, 2014). An RoR HPP might include some short-term storage allowing for some adaptations to the demand profile, but the generation profile will vary according to the local river flow conditions. Generation, therefore, depends on precipitation and run-off and might have substantial daily, monthly or seasonal variations (Ellabban *et al.*, 2014). HPPs with a reservoir are called storage HPPs since they store water for later consumption (Ellabban *et al.*, 2014). The reservoir reduces the dependence on the variability of the inflow. The generating stations are located downstream and are connected to the reservoir through pipelines (Ellabban *et al.*, 2014). Pumped storage HPPs are not energy sources, but they can be used as storage devices. In such a system, water is pumped from a lower reservoir into an upper reservoir, usually during off-peak hours and the flow is reversed to generate electricity during the daily, peak load period. This is the largest form of grid energy storage capacity readily available worldwide (Ellabban *et al.*, 2014).

2.2.4 Biomass Energy

Biomass is the term used for all organic material originating from plants, trees and crops, which collect and store the sun's energy through photosynthesis (Ellabban *et al.*, 2014). Biomass energy (bio-energy) is produced by converting biomass into useful forms of energy such as heat, electricity and liquid fuels (bio-fuels), (Ellabban *et al.*, 2014). Bio-fuels can be transported and stored and allow for heat and power generation on demand, which is essential in an energy mix with a high dependence on intermittent sources such as wind (Ellabban *et al.*, 2014). Biomass resources are currently being promoted as a strategy to achieve sustainable development. Being available locally, biomass enables widespread production of energy at reasonable costs and can help to mitigate climate change, develop rural economies and increase energy security (Angelis-Dimakis *et al.,* 2011).

2.2.5 Marine Energy

Renewable marine (ocean) energy comes from six distinct sources: waves, tidal range, tidal currents, ocean currents, ocean thermal energy conversion and salinity gradients, each with different origins and requiring different technologies for conversion (Ellabban *et al.*, 2014). Technology developers in all of these sectors of marine energy are constrained primarily by a shortage of capital and, in particular, by reluctance on the part of investors generally to commit to the significant level of capital necessary to demonstrate commercial feasibility (European Ocean Energy Association, 2013; Angelis-Dimakis *et al.,* 2011; World Energy Council, 2013a Ramagoma, 2015b).

2.2.6 Geo-thermal Energy

Geo-thermal energy is a powerful and efficient way to extract renewable energy from the earth by natural processes (Ellabban *et al.*, 2014). This can be performed on a small scale to provide heat for a residential unit by using a geo-thermal heat pump or, on a large scale, for energy production through a geo-thermal power plant, which is considered to be a cost-effective, reliable, and environmentally friendly energy source (Ellabban *et al.*, 2014). Geo-thermal energy sources are classified as hydro-thermal systems, conductive systems and deep aquifers (Ellabban *et al.*, 2014). Worldwide use of geo-thermal energy has increased steadily over the past few decades and exploration and development are on-going at unprecedented levels in Iceland, New Zealand, East Africa, Germany, Chile and Australia (Moore & Simmons, 2013). According to Bertani (2010: 2), if installed capacity is considered in terms of the country’s land area or population, then the smaller countries dominate the top five producers of geo-thermal energy including the Netherlands, Switzerland, Iceland, Norway, Sweden, and Denmark (Ramagoma, 2015b). The largest increases in the use of geo-thermal energy over the past five years have been in the United Kingdom, the Netherlands, Korea (Republic), Norway and Iceland; and the largest increases in installed capacity (MWt) are in the United Kingdom, Korea (Republic), Ireland, Spain and the Netherlands, mostly because of the increased use of geo-thermal heat pumps (Bertani, 2010: 2).

2.3 Global Perspective on Renewable Energy

The year 2015 was an extraordinary one for renewable energy, with the largest additions to global capacity seen to date, although challenges remain, particularly beyond the power sector (Seyboth, 2016). There were several developments in 2015 that all have a bearing on renewable energy including: a dramatic decline in global fossil fuel prices; a series of announcements regarding the lowest-ever prices for long-term renewable power contracts; a significant increase in attention to energy storage; and a historic climate agreement in Paris that brought the global community together (Seyboth, 2016). The use of biomass for heating continues to grow as well. In Sweden, national use of biomass energy has surpassed that of oil. Renewable energy provided an estimated 19.2% of final, global energy consumption in 2014, and growth in capacity and generation continued in 2015 (Seyboth, 2016).

This upward trend in the use of renewable energy sources has been driven by increased global investment in the sector. According to the 9th Global Trends in Renewable Energy Investment 2015 (UNEP, 2015), the past year brought a rebound of green energy investments worldwide with a surge of 17% to $270 billion. Brushing aside the challenge of sharply lower crude-oil prices, this sudden increase reversed the investment dip of the previous two years and was driven mainly by investments in solar and wind energy (UNEP, 2015).

The use of solar energy is growing strongly around the world, partly as result of the rapidly declining costs of manufacturing solar panels (WEC, 2013). For instance, between 2008 and 2011, PV capacity increased in the USA from 1 168MW to 5 171MW and, in Germany, from 5 877MW to 25 039MW (WEC, 2013).

Global investment in renewable energy also climbed to a new record level, in spite of the plunge in fossil fuel prices, the strength of the US dollar (which reduced the dollar value of non-dollar investments), the continued weakness of the European economy and further declines in per unit costs of wind and solar photovoltaics (Seyboth, 2016). Table 2.1 gives an indication of the countries investing in renewable energy around the world.

Table 2.1: Countries investing in renewable energy by 2015

Top Five Countries

Annual investment / net capacity additions / biofuel production in 2015

	1	2	3	4	5
Investment in renewable power and fuels (not including hydro > 50 MW)	**China**	United States	Japan	United Kingdom	India
Investment in renewable power and fuels per unit GDP[1]	**Mauritania**	Honduras	Uruguay	Morocco	Jamaica
Geothermal power capacity	**Turkey**	United States	Mexico	Kenya	Germany/Japan
Hydropower capacity	**China**	Brazil	Turkey	India	Vietnam
Solar PV capacity	**China**	Japan	United States	United Kingdom	India
Concentrating solar thermal power (CSP) capacity[2]	**Morocco**	South Africa	United States	–	–
Wind power capacity	**China**	United States	Germany	Brazil	India
Solar water heating capacity	**China**	Turkey	Brazil	India	United States
Biodiesel production	**United States**	Brazil	Germany	Argentina	France
Fuel ethanol production	**United States**	Brazil	China	Canada	Thailand

Source: REN21 (2016)

According to UNEP (2015), there has been a remarkable increase in existing renewable energy markets as well as new markets. China saw by far the biggest renewable energy investments in 2014 with a record $83.3 billion, up 39% from 2013 (UNEP, 2015). The US was second at $38.3 billion, up 7% on the year but well below its all-time high reached in 2011. Japan was third at $35.7 billion, 10% higher than 2013 and its biggest total ever (UNEP, 2015). This is a clear indication that the countries that have suffered over the past years from the negative effects of traditional energy generation using coal-fired and nuclear power stations are under increased pressure to “go green” (UNEP, 2015).

Renewable energy generating capacity saw its largest annual increase ever in 2015, with an estimated 147 GW of renewable capacity added. Total global capacity was up almost 9% during 2014, to an estimated 1,849 GW at year’s end.

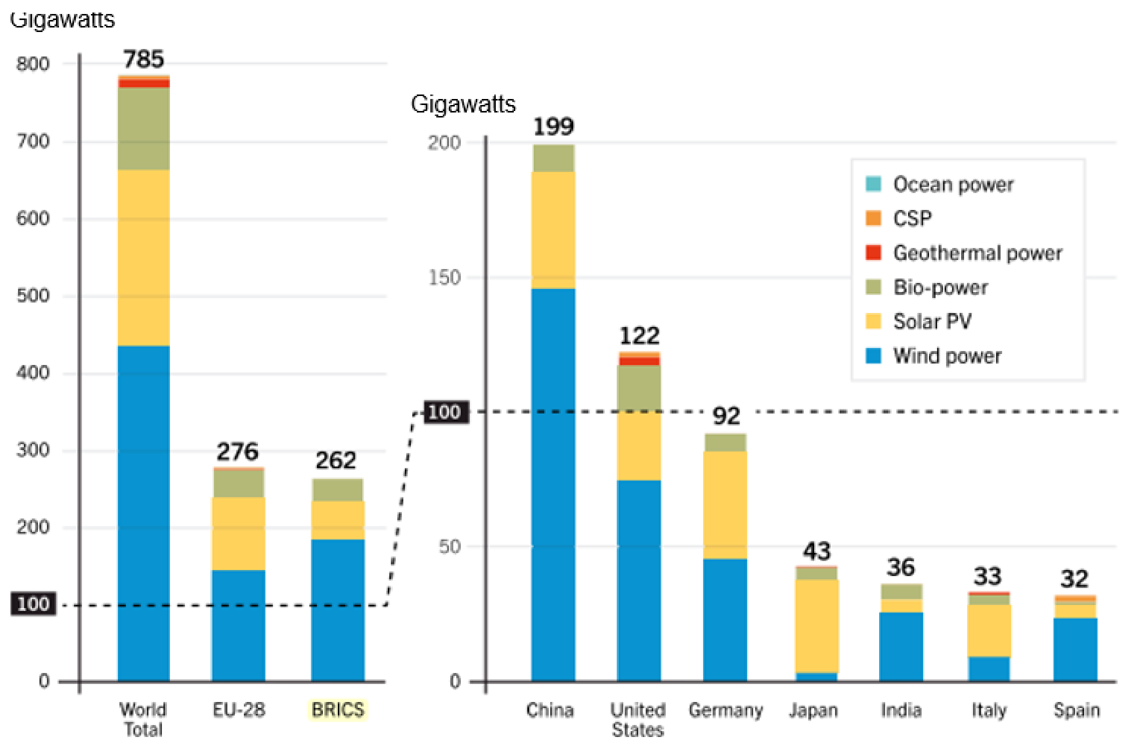
Wind and solar PV both saw record additions for the second consecutive year, together making up about 77% of all renewable energy capacity added in 2015.
Hydro-power capacity rose by 2.7% to an estimated 1,064 GW, accounting for approximately 19% of all additions (Seyboth, 2016).

2.4 Renewable Energy in the BRICS Countries

The BRIC acronym, which stands for Brazil, Russia, India and China, originated in a Goldman Sachs paper titled: Building Better Global Economic BRICs, as part of an economic modelling exercise to forecast global economic trends over the next half-century (Singh & Dube, 2006). The main finding was that the BRIC countries collectively would play an increasingly important role in the global economy (Singh & Dube, 2006). With the recent inclusion of South Africa in 2010 to the BRIC forum, the acronym was extended to BRICS (Singh & Dube, 2006). By 2010, the BRICS countries had reached 26.64% of global GDP by purchasing power parity (Aleksashenko, 2015). By 2013, the most recent data available showed the increase in the aggregated weight of the BRICS in global GDP by purchasing power parity to be significantly smaller – only two percentage points, approaching a total weight of 30% (Aleksashenko, 2015).

A key feature of the UNEP 2015 report was the rapid expansion of renewables in the BRICS countries such as China, Brazil ($7.6 billion), India ($7.4 billion) and South Africa ($5.5 billion) all of which were in the top 10 investing countries (UNEP, 2015). The top 10 national investors consisted of six developing countries (four of which were BRICS countries), and four developed countries (Seyboth, 2016). China led with more than double the investment of the next largest investor, the United States, followed by Japan, the United Kingdom and India (Seyboth, 2016). The next five were Germany, Brazil, South Africa, Mexico and Chile (Seyboth, 2016). India moved up to displace Germany, which saw a sharp drop in investment, while South Africa, which had slipped off the top 10 list in 2014, ranked eighth in 2015, and Mexico and Chile ranked among the top 10 for the first time in 2015 (Seyboth, 2016).

Figure 2.1: Renewable power capacity in the World, EU and BRICS Countries



Source: UNEP (2015)

2.4.1 Brazil

Brazil has one of the cleanest energy matrices in the world with 47% of the country's overall energy production coming from renewable sources. The worldwide average is about 19%. Over 80% of the installed capacity of electricity generation in the country (121,823 MW) comes from renewable sources (PwC, 2013). During the last five years, three other renewable resources, including wind power, have become competitive in large-scale expansion of generation (PwC, 2013). Brazil, Chile, Mexico, and Uruguay are the leading renewable energy champions within Latin America (Ren21, 2014). A highlight of the past decade has been the introduction of renewable auctions in Brazil, resulting in highly competitive prices for electricity generated from wind (Ren21, 2014). The past decade has also seen Brazil expanding its bio-fuel, large hydro and, since 2009, onshore wind sectors (Ren21, 2014). One of the first renewable energy policies of Brazil was the Program of

Incentives for Alternative Electricity Sources (PROFINA), a feed-in-tariff-like scheme developed in 2002, which evolved into a renewable energy auction system in 2009 (Ren21, 2014). Wind power has experienced the fastest growth in recent years, with Brazil and Mexico leading the way (Ren21, 2014). However, in Brazil, hydro-power expansion is expected to become increasingly constrained by environmental sensitivity and the remoteness of much of the remaining water resources (Ren21, 2014).

Brazil's requirements to ensure a measure of local content requirement (LCR), added a precondition that, to receive public financing, project developers participating in auctions were required initially to source 40% of the components for wind turbines from Brazilian suppliers (increasing to 60% in 2012) in order to qualify for subsidised loans from the Brazilian Development Bank or Banco Nacional de Desenvolvimento Economico e Social (IRENA, 2014).The idea was that this would provide more job creation and, as a result, Brazil has almost one million people employed, mostly in liquid bio-fuels, given the labour requirements of feedstock production (IRENA, 2016). Meeting its 2022 target of 100 GW of solar alone is expected to create 1.1 million jobs and Brazil would continue to be a key employer with most of the jobs concentrated in bio-energy feedstock harvesting and processing (IRENA, 2016). According to the available literature, job creation has been the primary aspect of economic development resulting from renewable energy in Brazil, but there are no direct, socio-economic benefits to the communities surrounding renewable energy facilities.

2.4.2 Russia

According to Willems (2015) of the International Finance Corporation (IFC), Russia has been dubbed the "Green Giant" because of its renewable energy potential. Russia is the fifth largest producer of renewable energy in the world, although it is 56th when hydro-electric energy is not taken into account (Sievert, 2010). Some 179 TWh of Russia's energy production comes from renewable energy sources out of a total, economically feasible potential of 1 823 TWh (Kajaste, 2008). Hydro-power generates 16% of Russia's electricity and less than 1% is generated from all other renewable energy sources combined. However, in a bid to modernise its economy and move away from resource-based economic development, Russia considers the development of a green economy to be a strategic option that could increase overall economic efficiency (Piskulova, 2013). In 2013, Russia launched its first tenders for renewable energy, selecting 39 projects that totalled 504 MW of new capacity, including 399 MW of solar PV projects (Belokrylova, 2014). The Energy Strategy of Russia (The Strategy) declares that, until 2030, the aim is to implement alternative energy in all spheres of life (Belokrylova, 2014). Furthermore, in 2020, the rate of production and consumption of electricity from renewable energy sources will be increased by 5% (Belokrylova, 2014). Russia might have installed new turbine-generators with a capacity of as much as 3.2 GW during the year, but the net increase in installed capacity amounted to only 0.7 GW, with rehabilitation of existing facilities presumably accounting for the difference (REN21, 2014). In hydro-power, the Russian Federation continued to rank fifth, globally, for total installed capacity, adding a net of 143 MW in 2015 for a year-end total of 47.9 GW (Seyboth, 2016). Hydro-power generation, at 160 TWh, was down 4.1% relative to 2014. RusHydro completed several refurbishment projects in 2015 and had plans to continue modernisation efforts for improved reliability, efficiency and security (Seyboth, 2016). Federation's Boguchanskaya plant, which saw completion of the last of nine 333 MW units in late 2014, achieved an effective capacity of 3 GW when its vast reservoir finally reached design capacity in June 2015 (Seyboth, 2016).

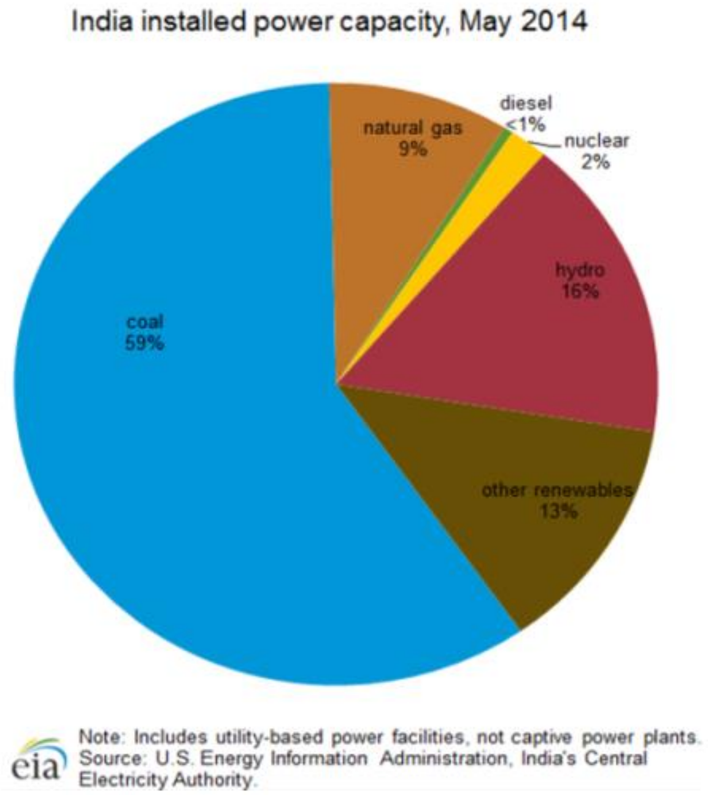
The data that would be necessary to enable us to estimate the number of green jobs in Russia are simply not available (Piskulova, 2012). However, the recently announced re-orientation of the Russian strategy towards technological development and green growth, implemented in investment policy and the use of new technologies; the on-going transformation of environmental legislation; and the growing demand for environmental goods and services, as well as the growing concern for a satisfactory and healthy environment, could well stimulate green employment (Piskulova, 2012). Nevertheless, the on-going realisation of energy efficiency measures in all sectors of the economy is already increasing the number of green jobs (Piskulova, 2012). Since the Russian government has made energy efficiency a central part of its economic development strategy, job increases in the short- and medium-term are forecast in this field (Piskulova, 2012). According to the literature there does not appear to be a direct link between the installation of renewable energy sites in Russia and socio-economic and economic development after the construction phase of the plants.

2.4.3 India

India was the first country in the world to set up a ministry of non-conventional energy resources in the early 1980s. India's cumulative grid interactive or grid tied renewable energy capacity (excluding large hydro), has reached 33.8 GW (MNRE, 2015), of which 66% comes from wind, while solar PV contributed nearly 4.59% of the installed capacity of renewable energy in India (RIC, 2013). India’s renewable energy capacity is nearly 13% of total generation capacity. Of the total renewable energy generation, wind energy currently makes up the majority with nearly 70% (CEEW, 2014). In its 12th Five Year Plan (2012 - 2017), the Indian government has set a target of adding 18.5 GW of renewable energy sources to the generation mix out of which 11 GW is the wind estimation and the rest from renewable sources like solar (4 GW) and others 3.5 GW (GoI, 2012) as illustrated in Figure 2.2.

The wind energy market in India comprises a relatively tight stakeholder group. The stakeholder organisations include fewer than 20 main project developers that provide end-to-end turnkey solutions; independent power producers (IPP); policymakers and implementing agencies; turbine manufacturers, research and development institutes, and industry associations. As of 2010, the wind energy industry was estimated to be employing 42,000 people directly and indirectly in India. An additional 60,000 wind energy jobs will be needed by 2020, according to growth estimates from the Ministry of New and Renewable Energy (MNRE, 2010). The jobs created will include project planning, development, construction, and commissioning. In India the renewable energy sector employs almost 0.5 million people (IRENA, 2016).

Figure 2.2: India's installed power capacity



Source: EIA (2014)

Employment in India is expected to increase substantially as it is scaling up its ambition for solar PV and wind deployment (Seyboth, 2016). Meeting its 2022 target of 100 GW of solar alone is expected to create 1.1 million jobs (Seyboth, 2016). There is no evidence that there is a focus on SED and ED projects in the same manner as is required in RSA. Perhaps the closest to community beneficiation is the Indian Solar Loan Programme, supported by the United Nations Environment Programme that won the prestigious Energy Globe World Award for Sustainability for helping to establish a consumer-financing programme for home solar power systems (UNEP, 2007). Over the span of three years, more than 16,000 home solar power systems have been financed through 2,000 bank branches, particularly in rural areas of South India where the electricity grid does not extend yet (UNEP, 2007). The fundamental difference is that the consumers had to pay for the home solar power systems.

2.4.4 China

China has become a global leader in renewable energy. The country has vast resources and great potential for future development. In 2013, China installed more new renewable energy capacity than all of Europe and the rest of the Asia Pacific region (IRENA, 2014). The main drivers for this shift were the increasing cost-competitiveness of renewable energy technologies and other benefits such as improved energy security and decreased air pollution (IRENA, 2014).

Wind became China’s second largest source of renewable power in 2013 and has potential to grow further. Renewable Energy Roadmap 2030 envisages a fivefold increase in onshore wind capacity, from 91 GW in 2013 to 500 GW by 2030 (twice the current installed capacity worldwide), and an additional 60 GW capacity in offshore wind (IRENA, 2014).

China installed 13 GW of solar PV capacity in 2013, a substantial increase that resulted in a total installed capacity of 20 GW of which 1 GW came from distributed projects, such as rooftop solar PV on residential or commercial buildings. China aims to raise the total to 70 GW by 2017, with equal contributions from utility-scale and distributed projects. Remap 2030 envisages a total installed capacity of 308 GW by 2030, which is twice the current installed capacity worldwide (IRENA, 2014).

In China, the socio-economic benefits of renewable energy deployment include increased income, industrial development and job creation (IRENA, 2014). China has firmed up its position as the leading renewable energy job market with 3.4 million employed (Miketa & Saadi, 2015)

2.4.5 The Republic of South Africa as part of BRICS

South Africa occupies a central position in the global debate regarding the most effective policy instruments to accelerate and sustain private investment in renewable energy (Eberhard, Leigland & Kolker, 2014). The renewable energy programme, now known as the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP), has successfully channelled substantial private sector expertise and investment into grid-connected, renewable energy in South Africa at competitive prices. To date, 64 projects have been awarded to the private sector (Eberhard *et al.*, 2014). According to the World Bank Group report, the private sector in South Africa has committed to investment totalling R168bn, and these projects will generate 3 922 megawatt (MW), of renewable power (Eberhard *et al.*, 2014). Most impressively, these achievements all occurred over a two-and-a-half-year period and have been characterised, according to one REIPPPP investor, as being "the most successful public-private partnership in Africa in the last 20-years" (Eberhard *et al.*, 2014:1).

South Africa has potentially one of the highest solar energy regimes in the world with average, daily, direct, normal radiation in excess of 7 KWh/m^2 (Eberhard *et al.*, 2014). The most favourable areas are in the Northern Cape, at some distance from the main metropolitan areas. South Africa also has reasonable wind energy resources with average wind speeds above 7 m/s in some coastal and escarpment regions (Eberhard *et al.*, 2014). Renewable energy and the renewable energy sector in South Africa specifically are considered further later in this chapter.

2.5 Renewable Energy in Africa

According to the International Renewable Energy Agency (IRENA), renewable energy resources in Africa are plentiful, including solar, wind, biomass, geo-thermal and hydro (IRENA, 2015). These resources are spread across the continent and could provide affordable and secure supplies of energy where there is a high demand (2015). Markets for renewable energy are growing fast in some countries in Africa and that trend is spreading (2015). African countries are generally endowed with abundant renewable energy potential, which they can harness so that, by 2040, renewables provide more than 40% of all power generation capacity in the region, varying in scale from large hydro-power dams to mini- and off-grid solutions in more remote areas (IEA, 2014).

Hydro-power has long been an important part of many African power systems and is the most used, renewable energy source because of the large-scale of potential development and the low average costs of electricity generated – lower than any other technology, renewable or otherwise (IEA, 2014).

Table 2.2: Africa's targets for renewable energy		
Country	**Renewable energy target**	**Target year**
Cameroon	50% / 90%	2015 / 2020
Cape Verde	50%	2020
Ghana	10%	2020
Madagascar	75%	2020
Mauritius	65%	2028
Niger (the)	10%	2020
Nigeria	7%	2025
Rwanda	90%	2012
Source: IRENA (2015)		

Africa is particularly rich in solar energy potential with most of the continent enjoying an average of more than 320 days of bright sunlight per year and experiencing irradiance levels of almost 2 000 kWh/m^2 annually – twice the average level in Germany (JRC, 2011). Solar is gaining a foothold in Sub-Saharan Africa (WEO, 2014) where installed capacity increased from 40 MW in 2010 (mainly small-scale PV), to approximately 280 MW in 2013 (including some large PV and CSP plants). Current installed capacity for Africa, counting all types of generation, is 150 GW (IRENA, 2015). The total technical generation potential for concentrating solar power (CSP) is about half that of solar PV. Some West African countries have no CSP potential (IRENA, 2015).

Deployment of wind power has been very limited to date when compared with hydro-power, with only 190 MW in all of Sub-Saharan Africa, even though the levelled cost of electricity from onshore wind technologies has declined significantly in recent years (WEO, 2014). The potential wind energy of Sub-Saharan Africa is estimated at approximately 1 300 GW, which would produce several times the current level of total African electricity consumption (Mandelli, 2014). The potential energy from offshore wind is best off the coasts of Madagascar, Mozambique, Tanzania, Angola and South Africa (WEO, 2014). The cost of wind energy can be competitive compared with other technologies where the resources are good, but other factors could limit its deployment (WEO, 2014). According to the World Energy Outlook Africa Report (WEO, 2014), power grids are not well developed, meaning that variable generation from wind would introduce additional challenges to an already unstable and intermittent system. With improvements in the operations of power systems in Africa and the increasing size of the systems, the amount of wind power that can be added without creating formidable operational challenges will increase (WEO, 2014). There is no direct link between the establishment of renewable energy sites in Africa and the socio-economic development of communities surrounding the sites.

2.6 Renewable Energy in the Republic of South Africa

Given the recent introduction of load shedding schedules across South Africa, as well as the call for an increase in electricity tariffs, renewable energy has become an increasingly important solution to meeting the demand for electricity. According to the Department of Energy 2003 White Paper on Renewable Energy, the South African Government recognised the high potential of renewable energy in South Africa and has a target of 10 000 GWh of renewable energy in place (DoE, 2003). The minister determined that 3 725 megawatts (MW) would have to be generated from renewable energy sources to ensure the uninterrupted supply of electricity (DoE, 2003). This bold step resulted in the launch of the Renewable Energy Independent Power Producer Procurement Program (REIPPPP), which is an ambitious, yet successful, initiative spearheaded by the Department of Energy, which has procured several gigawatts of renewable energy generated at costs that are increasingly competitive compared with coal-fired electricity (WWF, 2014). To achieve this feat, REIPPPP has mobilised an investment of over R100 billion in renewable energy, largely from the private sector within the short span of less than three years (Papapetrou, 2014).

According to the World Wildlife Fund (WWF), the boldness of the REIPPPP is a clear response to three critical issues, which needed to be addressed in South Africa (WWF, 2014). These included South Africa's urgent need for new generation capacity to alleviate critical energy supply constraints; mounting international pressure to decarbonise the country's energy supply; and a significant political will and desire to promote a sustainable, renewable energy industry, which would deliver both cost-effective energy and socio-economic benefits (Papapetrou, 2014).

On 3 August 2011, the DoE released the request for proposals for the IPP Programme which was designed to procure the necessary 3 725 MW determined by the minister of energy (DOE, 2015). The allocation to the various renewable energy technologies was as follows:

- 1 850 MW from onshore wind generated power;
- 200 MW from concentrated solar thermal generated power;
- 1 450 MW from solar photovoltaic generated power;
- 12.5 MW from both biomass and bio-gas generated power;
- 25 MW from landfill gas generated power;
- 75 MW from small hydro-electric generated power; and
- 100 MW from an unspecified number of small-scale IPP projects of less than 5 MW.

After taking a decade for the first 10 MW of wind power to be installed, the South African wind industry added 560 MW to the country's electricity grid in 2014 (GWEC, 2014). The development of the wind industry has taken place within a relatively short period of about three years, placing South Africa amongst the leading new global markets for wind generated power (GWEC, 2014).

PV technology was introduced to South Africa in the 1980s. However, up until a few years ago, the solar photovoltaic industry in South Africa consisted of small-scale installations, predominantly off-grid and in rural areas. In the late 1990s, larger scale commercial projects were implemented but these projects were still only tens of kW in size (Maphelele, Stanford & Kooverji, 2013). In 2010, because of rapidly increasing electricity costs and an ever-increasing awareness of global warming issues, there was a marked increase in larger scale commercial projects of hundreds of kW in size and, in 2013, construction began on 18 large, utility scale projects with a combined capacity of 630 MW (Maphelele *et al.*, 2013).

This IPP Procurement Programme has been designed to contribute towards a target capacity of 725 megawatts and to stimulate socio-economic and environmentally sustainable growth in the renewable energy industry in South Africa (Pretorius, 2011). Without much thought and planning given to how this would work practically, the renewable energy companies were required to submit project proposal bids that contained elements of economic development as well as pricing. This posed a particular challenge for bidders who were not familiar with the needs of the communities surrounding the proposed renewable energy sites. Bidders were required to assess the needs of communities within a 50 km radius of project sites and prepare strategies to address these needs using contributions from the project's revenues (PPIAF, 2014). Socio-economic development plans had to be prepared by bidders and submitted with proposals. Beyond these minimal instructions in the tender documents, the DoE provided no guidance on how to prepare acceptable plans or how to demonstrate potential benefits, and gave no indication of how these submissions would be scored (PPIAF, 2014). The requirements of the DoE in the REIPPPP documentation included recognition of the programme's great potential to realise positive socio-economic outcomes including: job creation and local content, local ownership, socio-economic development, management control and enterprise development.

Table 2.3: Economic Development criteria of the RE IPPPP - 2012

Economic Development Elements	Weighting
Job creation	25%
Local content	25%
Ownership	15%
Management control	5%
Preferential procurement	10%
Enterprise development	5%

Socio-economic development	15%
Total	100%
Total points	30%
Source: DoE	

2.6.1 South Africa's Renewable Energy Independent Power Producer Procurement Programme (REIPPPP)

In August 2011, the DoE issued the first request for proposals (RFP) for the REIPPPP, which called for 3 725 MW of renewable energy capacity to be procured from the private sector over five rounds. This was subject to minimum project qualification criteria and a competitive bidding process. There was some doubt whether South Africa could deliver on such ambitious targets after previous failed attempts of which one notable example was the Renewable Energy Feed-In Tariff (REFIT) Programme, which was announced in 2009 but failed to materialise (WWF, 2014).

After just over 3 years, REIPPPP has become an international success story for public-private partnerships and is lauded for surpassing the original objectives set out in the first RFP (Eberhard *et al.*, 2014). REIPPPP offered a quick way to roll out new generating capacity and the size and structure of the bidding process meant that there would be multiple bid winners, which was an important incentive for the private sector to participate (Eberhard *et al.*, 2014). The rolling bidding process with substantial capacity allocations helped to build confidence in the programme as well as certain exemptions from some of the national PPP regulations and the provisions of the Preferential Procurement Policy Framework Act helped to fast-track the programme, without negatively affecting transparency or quality (Eberhard *et al.*, 2014). In terms of important market factors affecting the programme, the global slow-down in renewable energy markets in the OECD meant that REIPPPP was able to attract considerable attention from the international private sector (Eberhard et al., 2014). However, one of the challenges presented to renewable energy companies that has not been articulated clearly by the DoE is that of socio-economic development and enterprise development as well as community shareholding in the form of trust or local community companies.

In view of the importance of economic development in South Africa and the significant position of renewable energy companies in particular, the absence of empirical evidence on the management of revenue for beneficiary communities presents an important gap in research literature. The following section of this chapter addresses this limitation by identifying the factors that influence revenue management in this unique context. Once these factors have been identified, it will be possible to examine the effective management of revenue for beneficiary communities to ensure that the renewable energy companies in South Africa optimise their critically important contribution to the South African economy.

As was pointed out in Chapter 1, there are three streams of revenue for beneficiary communities from renewable energy companies in South Africa as part of their obligations to the DoE. Given that a number of projects have reached commercial operations date (COD), revenues have already begun to flow to the beneficiary communities within a 50km radius of each of these renewable energy facilities. The 50km radius criterion has been a cause for concern because it often cuts across municipal and cultural boundaries and some towns fall within the overlapping circles of more than one renewable energy facility. The IPP office in the DoE has already expressed concern that, despite the economic development plans submitted during the bidding process, there does not seem to be a planned and consistent approach for beneficiary communities.

2.6.2 Socio-Economic Development (SED)

The procurement documents define SED as “initiatives carried out by a measured entity towards the promotion of access to the economy by black people” (DoE, 2011: 12). As explained in Chapter 1, SED places a specific emphasis on facilitating sustainable access to the economy predominantly for black people. In the agreement, which South African renewable energy companies have with the DoE, they have committed to spend between 1.0% and 1.5% of total revenue on SED (DoE, 2011). The DoE has not given any specific instruction on how this revenue should be spent or how beneficiary communities are to benefit from the revenue. Renewable energy companies have resorted either to trying to deal with this obligation themselves or to employing service providers to spend the funding on their behalf. Furthermore, the DoE has stipulated that SED funding must be spent on a quarterly basis and that the record of this spending must be reported to the DoE on a quarterly basis as well. If a minimum of 65% of the 1.0% - 1.5% of revenue is not spent within the quarter for any of the measured elements, the company will be penalised with one-half of a termination point (Wlokas, Boyd & Andolfi, 2012). The company is then required to submit a rectification plan to the IPP Office of the Department of Energy that gives details on how it will correct the under spending in the following quarter (Eberhard *et al.*, 2014). If the company does not respond in a satisfactory way to correct the cause of each termination point, the points will accumulate (Eberhard *et al.*, 2014). In the event where the renewable energy company incurs more than nine termination points in one period of 12 months, the DoE will be entitled to terminate the agreement. In other words, the company will lose its licence to run a renewable energy facility in South Africa (Papapetrou, 2014). This, therefore, places considerable pressure on companies to meet the quarterly obligations while, at the same time, making a meaningful impact on the beneficiary communities (Eberhard *et al.*, 2014).

2.6.2.1 Global perspective on social and economic development

Many regions of the world are starting to align their economic development to energy consumption. Energy-based economic development is a process by which economic developers, energy policymakers and planners, government officials, industries, utilities, business leaders, and other stakeholders in a given region strive to increase energy efficiency (Carley et al., 2011; Zhang et al., 2013). The United Nations Research Institute for Social Development (UNRISD) adopts a broad definition of social development, which is concerned with processes of change that lead to improvements in human well-being, social relations and social institutions, which are equitable, sustainable, and compatible with principles of democratic governance and social justice (UNRISD, 2011). The definition emphasises social relations, institutional arrangements and political processes that are central to efforts to achieve desirable development outcomes. It includes material achievements, such as good health and education, and access to the goods and services necessary for decent living, and social, cultural and political achievements, such as a sense of security, dignity, the ability to be part of a community through social and cultural recognition, and political representation (UNRISD, 2011).

The World Bank (2005), proposed a working definition of social development which is described as the process of increasing:

- the assets and capabilities of individuals to improve their wellbeing;
- the capacity of social groups to exercise agency, transform their relationships with other groups, and participate in development processes;
- the ability of society to reconcile the interests of its constituent elements, govern itself peacefully, and manage change.

The World Bank’s social development strategy espouses the principles of inclusion, cohesion and accountability and refocuses the Bank’s social development work on three strategic priorities: more macro-level social development work, more socially responsive projects, and better grounding of its advice on sound social research (World Bank, 2005).

Soubbotina and Sheram, under the auspices of the World Bank, define economic development as the qualitative change and restructuring in a country's economy in connection with technological and social progress (Soubbotina & Sheram, 2000). The main indicators of economic development are increasing GNP per capita (or GDP per capita), reflecting an increase in the economic productivity and average material wellbeing of a country's population. Economic development is closely linked with economic growth (Soubbotina & Sheram, 2000).

2.6.2.2 Global perspective on development

Given this broad definition, “development” is a multi-dimensional concept by nature because any improvement of complex systems, as indeed actual socio-economic systems are, can occur in different parts or ways, at different speeds and be driven by different forces (Bellù, 2011). Additionally, the development of one part of the system might be detrimental to the development of other parts, giving rise to conflicting objectives (trade-offs) and, consequently, measuring development, i.e. determining whether and to what extent a system is developing, is an intrinsically multi-dimensional exercise (Bellù, 2011). According to the United Nations World Commission on Environment and Development in 1987, development is also closely linked to sustainability when it meets the needs of the present without compromising the ability of future generations to meet their own needs (Soubbotina & Sheram, 2000).

In summary, a comprehensive definition of socio-economic development is therefore described as the improvement of people’s lifestyles through improved education, incomes, skills development and employment. It is the process of economic and social transformation based on cultural and environmental factors. While global trends in socio-economic development present new opportunities for every country, they also raise new questions about social risk management and protection of vulnerable social groups (UNDP, 2015). These questions are reflected in the Millennium Development Goals (MDG) adopted by the UN member states, which, to a great extent, determine the directions of socio-economic strategies of many countries in the world (UNDP, 2015). The Millennium Development Goals, to be achieved between 1990 and 2015, included:

- Halving extreme poverty and hunger;
- Achieving universal primary education;
- Promoting gender equality;
- Reducing under-five mortality by two-thirds;
- Reducing maternal mortality by three-quarters;
- Reversing the spread of HIV and AIDS, malaria and TB;

- Ensuring environmental sustainability;
- Developing a global partnership for development, with targets for aid, trade and debt relief.

2.6.3 SED and Renewable Energy

Socio-economic benefits are gaining prominence as a key driver of renewable energy deployment. With many economies facing low growth, policy makers see potential for increased income, improved trade balance, contribution to industrial development, and job creation (IRENA, 2014). For example, it has been estimated recently that the global renewable energy sector employs as many as 9.2 million people (Ferroukhi, Khalid *et al.,* 2015).

2.7 SED and Renewable Energy from the Perspective of BRICS Countries

Saran, Singh and Sharan point out that, for the BRICS countries, economic growth has been seriously compromised in the years following the global financial crisis. Each percentage point reduction in global growth leads to a significant slow-down of economic development within BRICS, which hinges upon a necessary component of economic growth. As a result, the BRICS nations must seek to create institutions that enable viable alternatives for enhancing inclusive socio-economic development agendas within and outside BRICS and such institutions must eventually seek to set global benchmarks for best practices and standards (Saran *et al.*, 2013). One of these benchmarks is renewable energy's generation of electricity towards poverty alleviation. Economic development might be substantial, which suggests that targeting aid disbursements at electricity infrastructure can be an effective means of encouraging economic growth (Xie, 2009). However, the discussion on the role of electricity is on-going as Odhiambo, cited by Ramagoma (2015a), points out:

- Economic growth causes energy consumption and, as the economy grows, the demand for energy from different sectors of the economy increases (Ramagoma, 2015b);
- The other view is that it is the consumption of energy that causes economic growth (Ramagoma, 2015b);
- The third view argues that both electricity consumption and economic growth cause each other, i.e. there is a bi-directional causality between electricity consumption and economic growth (Ramagoma, 2015b).

Therefore, policy makers are increasingly interested in the potential benefits of deploying renewable energy for economic growth and job creation (IRENA, 2016).

In Brazil, the current government has assigned high priority to social development programmes (UNECE, 2007). "*Fome Zero*" is the federal government strategy to eradicate extreme poverty, notably by promoting food and nutrition security as well as access of the most vulnerable population to citizens' rights (UNECE, 2007). In this context, the government has streamlined the existing social transfer programmes into a unified, conditioned, social cash-transfer programme, "*Bolsa Familia*", for the most disadvantaged families. This offers financial subsidies as well as combined access to basic social rights (e.g. health, food, education and social assistance). Efforts are being made to improve the efficiency of the programme though better targeting (UNECE, 2007). In Brazil, the ancillary benefits of renewable energy include technology transfer, reduction of emissions of other pollutants and the creation of jobs, often called green jobs. It is known that job creation reflects on social, economic, and environmental aspects. Therefore, it can be an indicator of the social performance of energy projects (Simas & Pacca, 2013).

In Russia, the policy objective is to transform the country into an "economy of leadership and innovation" (IFC, 2011: 10) as stated in the Concept for Long-Term Social and Economic Development to 2020 ("the Concept"). The Concept envisages that Russia will not only remain a key producer and exporter of raw materials, but that it will also develop high-tech sectors and make its economy "competitive worldwide" (IFC, 2011: 10). It states that there will be several aspects to the transition to an innovative economy, including “winning leading positions in the development of renewable energy sources”. Russian Government Resolution No. 1-r also states that the use of renewable energy contributes to the “integration of innovative high technology and equipment in the energy sector” (IFC, 2011:10). Another important objective set out in the Concept is “balanced territorial development” and reducing inequalities in regions where renewable energy can play an important role by boosting economic development and creating jobs in regions with abundant renewable energy resources (IFC, 2011). This will help Russia to achieve two more of the objectives set out in the Concept, namely, human welfare and social well-being and harmony (IFC, 2011).

In India, a recent analysis in 2014 revealed that the total direct and indirect employment from renewable energy amounted to almost 350 000 jobs in 2010, comprising 42 000 jobs in the wind sector, 112 000 in on- and off-grid solar PV, and 41 000 in solar thermal. The remainder was jobs in bio-energy and hydro-power (IRENA, 2014). Using moderate- and high-growth scenarios, total future job creation in the renewable energy sector can increase to between 589 000 and 699 000 jobs by 2015 and 1 051 million to 1 395 million jobs by 2015 (IRENA, 2014). In addition, the Indian Ministry for New and Renewable Energy provides funding for education and research projects related to renewable energy (IRENA, 2014).

In China, the National Development & Reform Commission (NDRC) introduced mandatory market share (MMS, or “renewable portfolio standards” as they are called in the United States) in 2007, linked to the country’s mid-term (2007-2010), and long-term (until 2020) development plans for renewable energy (IRENA, 2014). The NDRC is a ministry in the central government that is responsible for planning the economic development of the country, and it has been assigned the responsibility for energy and climate change (IRENA, 2014). It is noted that one of the main drivers in China’s renewable energy programme is air pollution (IRENA, 2014). Air pollution and its effects on health and the economy are a serious concern for China. According to some estimates, the total number of mortalities from ambient air pollution (particulate matter and ozone pollution) reached approximately 1.2 million in 2010. China has succeeded in reducing particulate matter (PM) levels substantially and slowing the increase in mortalities, but further reductions remain a challenge (OECD, 2014).

2.8 African Perspective on SED

In Africa, renewable energy-related employment remains low except in a few countries such as Kenya, Morocco and South Africa, where deployment growth is creating domestic value and jobs (Ferroukhi *et al.*, 2015). Various member countries of the Economic Community of West African States (ECOWAS) have started tailoring aspects of their education and training policies and approaches to support renewable energy deployment (IRENA, 2014). In Ghana, for example, the Kwame Nkrumah University of Science and Technology (KNUST), in collaboration with several partners from other countries, started offering an MSc Programme in Renewable Technologies by means of e-Learning in 2011, supported financially by the EU (KNUST, 2011). The main objectives of the programme are two-fold: to increase the number of skilled engineers in renewable energy; and to enrich the knowledge of key actors, including energy policy-makers and entrepreneurs, on related issues (IRENA, 2014). Training is also taking place in universities in Benin, Burkina Faso, Cape Verde and in other capital cities such as Dakar and Bamako. The Faculty of Science and Technology at the University of Bamako also carries out studies related to RETs (Coulibaly & Bonfiglioli, 2011). In the case of Nigeria, the Energy Commission, in collaboration with other private sector players such as non-governmental organisations, has been undertaking training in renewables,

2.9 RSA's Perspective on SED

The Renewable Energy Independent Power Producer Procurement Programme (REIPPPP), South Africa's flagship RE deployment policy, seeks explicitly to maximise economic value from RE deployment (IRENA, 2014). Since the programme is also aligned with the over-arching social goals of the South African Government, extensive "non-price" criteria are considered in the assessment process. In particular, the Department of Energy assesses seven socio-economic factors (IRENA, 2014): job creation (weighting: 25%), local content (25%), ownership (15%), socio-economic development (the need of the communities surrounding the project site: 15%), preferential procurement (10%), management control (5%), and enterprise development (5%). Hence, the programme can work as a driver for the private sector to foster socio-economic development within historically disadvantaged communities (Tait, 2011).

Socio-economic development is defined in the procurement documents as “initiatives carried out by a measured entity towards the promotion of access to the economy by black people” (Wlokas *et al.*, 2012: 47). According to the South African Department of Trade and Industry, SED is defined in the Broad-based Black Economic Empowerment Act 53 of 2003, Section 9(5): Codes of Good Practice (DTI, 2012). It is referred to specifically as code 700 – Measurement of the Socio-economic Development of B-BBEE. The main purpose of Code 700 is to encourage initiatives that enhance the ability of black people to gain access to the economy in a sustainable manner. “Black people” is a generic term, which means Africans, Coloureds and Indians in accordance with the Broad-Based Black Economic Empowerment Act, 2003 (DTI, 2012). The code attempts to redress the fact that many black people living in the post-apartheid South Africa are unable to access the economy because of poverty and deficiency in education. Government (DTI, 2012) envisages that SED will create an environment that:

- Provides funding and resources for impoverished communities;
- Provides skills development and mentoring for beneficiary communities so that they are able to access the job market;
- Creates and enables an affordable environment for beneficiary communities to thrive.

South Africa could perhaps learn from comments by Jamie Holmes, policy analyst at the New America Foundation, who writes that we need to rethink our approaches to poverty reduction (Holmes, 2011). Many of our current anti-poverty efforts focus on access to health, educational, agricultural, and financial services and now, it seems, we need to start treating willpower as a scarce and important resource as well (Holmes, 2011).

However, there are a number of potential risks and challenges faced by renewable energy companies in RSA (ESI Africa, 2014). Renewable energy projects are situated in areas with severely depressed economies and, in most instances, there is a lack of delivery mechanisms such as NGOs and entrepreneurs that can manage the volume of SED funding (ESI Africa, 2014). According to ESI Africa (2014) the challenges include:

- Managing the expectations of the beneficiary communities;
- Managing potential community conflict in relation to funding and local community benefit;
- Lack of experience and developers who are primarily RE construction and power generation businesses,
- Managing community engagement processes;
- Difficulties include setting up meaningful and beneficial relations with beneficiary communities;
- Increasing education and awareness about RE technology relating to IPPs,
- Creation of meaningful jobs within the 50km radius;
- Strategic engagement with other neighbouring projects which are targeting the same communities.

The IPPs are required to contribute a percentage of projected revenues accrued over the 20-year operational life a project towards SED initiatives (IPP Office, 2015). The minimum compliance threshold for SED contributions is 1% of revenue with, a targeted level of 1.5%, over the 20-year project operational life and a portfolio average within this range is therefore expected (IPP Office, 2015).

The SED commitments have been made in six categories, namely: education, skills development, healthcare, social welfare, management, and planning, (IPP Office, 2015). All operational IPPs are required to report on the initiatives in which they have engaged to alleviate socio-economic challenges faced by the local communities in which they operate (IPP Office, 2015).

Although RSA has probably the most progressive renewable energy SED programme, it is not without its challenges as the following report by the IPP Office (2015) in the RSA Department of Energy points out:

- Deficient co-ordination and alignment of IPP SED plans with other IPPs in the same localities and broader government development strategies leads to duplication, fragmentation and inefficient SED spend;
- Other than the provision of power and access to electricity, IPPs are not in the business of community upliftment and thus often have difficulty in identifying areas that will address SED effectively in affected communities;
- Sparsely populated areas have limited community absorption capacity;
- SED contributions from IPPs are concentrated in communities that are in the vicinity of IPP projects, which implies that there is a lack of equity considerations across geographical areas (i.e. some communities benefit more than others);
- IPP revenue projections and availability imply enhanced SED gains over the longer term, while short-term community gains are also required for increased social acceptance of IPPs. Currently, local communities must get a minimum of 2.5% equity share in IPP ownership, with a target of 5.0%, which is paid into community trusts. However, this will be realised mainly in the longer term since most IPP nominal revenues in community trusts will peak in 10 to 15 years because of IPP debt repayments to finance institutions from the beginning of an IPP’s operation or revenue earnings.

As a result, the IPPPP Office is currently researching alternative SED financing mechanisms that could be considered to offer more immediate benefits to local communities, while enhancing benefits equitably to the broader South African economy, as well as the effectiveness and practicality of the IPPPP (IPP Office, 2015).

2.10 RSA's perspective on ED

Economic growth is key to addressing unemployment, gender equality, health and other poverty-related issues worldwide and ED is an essential element of economic growth (Verwey, 2011). Raizcorp defines enterprise development as investing time, knowledge and capital to help small and medium enterprises to establish, expand or improve businesses and includes empowering modest, informal, income-generating activities to grow and contribute to the local economy (Verwey, 2011).

As with SED funding, commitments to enterprise development are made as a percentage of revenue and, as such, obligations only become effective once an IPP starts operations. The target for IPPs to spend on enterprise development is 0.6% of revenues over the 20-year operational life of a project (IPP Office, 2015).

ED is defined in the Broad-based Black Economic Empowerment Act 53 of 2003, Section 9(5): Codes of Good Practice (DTI, 2003). It is specifically referred to as Code 600 – Measurement of the Enterprise Development element of BBBEE. The purpose of the ED Element of the Generic Scorecard is to assist black-owned qualifying small enterprises (QSE) and exempted micro enterprises (EME) to move from a survivalist and/or micro level to a level of sustainability and profitability. The table below defines what is meant by QSE and EME (DTI, 2012):

Table 2.4: Department of Trade and Industry in South Africa definition of QSE and EME (DTI, 2012)

ED Entity	Definition	BB-BEE Status
Qualifying Small Enterprise (QSE)	Business Enterprise with an annual turnover of between R10 million and R50m	annual turnover of R10 million or less
Exempted micro-enterprises (EME)	Business Enterprise with an annual turnover of R10 million or less	Level 4 Contributor At least 51% it is a level 2 Contributor If 100% Black owned it is a Level 1 Contributor

The enterprise development (ED) requirement is aimed at assisting small businesses in the local area and requires that projects make contributions that "assist and accelerate the development and sustainability of other enterprises, [and] financial and operation independence of other enterprises" (DoE 2011b: 7). In their bid submission, developers are required to "provide a list of the type of enterprises earmarked for development and also give an indication of the programmes that will be implemented with these enterprises. Provision should also be made for new enterprises" (DoE 2011b: 19).

2.11 RSA's Perspective on Community Shareholding

Community or local ownership requires that a percentage of the ownership of the company, which is measured by shares and other instruments, provides the holder with economic benefits, such as dividends or interest payments (DTI, 2004). A community trust is established which manages the shareholding asset on behalf of the community and governs spending decisions on developmental goals (Tait *et al.*, 2013b). The trust is managed by a board of trustees constituted of representatives from the community, independent power producers and other independent members (Tait *et al.*, 2013b).

Lindeman (1988: 10) defines a community trust as being a device that makes it possible for a group of citizens in any community to create trust funds for educational, benevolent, and charitable purposes. The principal investment is placed under the administration of a selected financial institution and the expenditures are controlled by a local committee in such a manner as to become a perpetual benefit to the community (Lindeman, 1988:10). South Africa's National Treasury Toolkit for Tourism (2005) defines a community trust as a not-for-profit trust created in terms of applicable law by volunteer members for the purpose of channelling the proceeds of various activities and investments for the common good of persons ordinarily resident within a specific town, village or settlement.

Since the communities in question are impoverished and do not have money to invest in these projects, there are two main ways in which the ownership element can be financed (Tait *et al.*, 2013b). One option is to give the shareholding as a “free carry” to communities, in other words, a gift. A developer may choose this option if they feel the project can afford it and still earn an acceptable rate of return. Alternatively, the ownership share may be financed through a ”soft loan” by a Development Finance Institution (Tait *et al.*, 2013b) such as the South African Industrial Development Corporation (IDC)The community ownership shares are funded through loans by the Industrial Development Corporation and the dividend pay-outs to communities will not be seen for the first few years of the project’s life while the loans to purchase the equity investment are repaid to the funders (Tait *et al.*, 2013b).

Therefore, Wlokas et al (2012) note that the local ownership entities often set up by project developers as community trusts are likely to have to deal with a relatively small income for about the first half of the 20-year project lifetime, followed by a sudden and steep increase in the second half. Researchers Tait, Wlokas and Garside (2013a) found that some developers said they have difficulties dealing with the negotiation procedures with different stakeholders and the complex interplay of benefits arising from land leasing, dividend benefits, project revenue benefits and jobs. It is unclear what roles different stakeholders should play and how they could or should be included in the various benefit streams (Tait *et al.*, 2013a). There is potential for confusion and discontent if stakeholders feel they have been unfairly excluded (Tait *et al.*, 2013a). Stakeholders therefore play a very significant role in revenue management for beneficiary communities in the renewable energy sector in RSA.

2.12 Stakeholder Theory and Key Renewable Energy Stakeholders

In order to understand the value of stakeholder theory in identifying key, renewable energy stakeholders, stakeholder theory and the term “stakeholder” are described. In addition, the necessity of stakeholders and the value of attending to their needs are addressed.

2.12.1 Stakeholder Theory

Stakeholder theory argues that there are other parties involved including communities, governmental bodies, political groups and trade unions amongst others (Stakeholder Theory, 2006). Stakeholder theory attempts to establish which groups are stakeholders in a business and thus justify management attention (Stakeholder Theory, 2006).

One common version of stakeholder theory (Phillips, 2004) seeks to define the specific stakeholders of a company (the normative theory of stakeholder identification), and then examine the conditions under which managers treat these parties as stakeholders (the descriptive theory of stakeholder salience). Phillips (2004) distinguished between two types of stakeholders namely, normatively legitimate stakeholders (those to whom an organisation holds a moral obligation), and derivatively legitimate stakeholders (those whose stakeholder status is derived from their ability to affect the organisation or its normatively legitimate stakeholders).

However, the focus of stakeholder theory is articulated in two core questions (Freeman, 1994). Firstly: what is the purpose of the business? This question encourages managers to articulate the shared sense of the value they create, and what brings its core stakeholders together. This shared sense of value propels the firm forward and allows it to achieve an outstanding performance, determined both in terms of its purpose and marketplace financial metrics (Farrington, 2009). Secondly: what responsibility does management have to stakeholders (Farrington, 2009)? This question pushes managers to articulate how they want to do business and, specifically, what kinds of relationships they want and need to create with their stakeholders to deliver on their purpose (Farrington, 2009).

The term “stakeholder” indicates a biased perspective. Rather than defining the unit of analysis as “interest groups” or “constituencies”, the term “stakeholder” deliberately denotes a contrast to “shareholders” (Freeman, 1999).

The classic (and most frequently cited) definition is that of Freeman (1984), namely that “a stakeholder in an organisation is (by definition), any group or individual who can affect or is affected by the achievement of the organisation’s objective”.

2.12.2 Identifying Renewable Energy Stakeholders

The term “stakeholder” indicates a subjective perspective and therefore the definition of a stakeholder can take on a narrow or broad scope. As a minimum, stakeholders are those groups from whom the organisation has voluntarily accepted benefits, and to whom the organisation has therefore incurred obligations of fairness (Farrington, 2009). A very common way of differentiating between the kinds of stakeholders is to consider groups of people who have classifiable relationships with the organisation (Fontaine, 2006) such as:

- Customers;
- Employees;
- Local communities;
- Suppliers and distributors;
- Shareholders.

In addition, other groups and individuals are considered to be stakeholders according to Friedman (2006) as follows:

- The media;
- The public in general;
- Business partners;
- Future generations;
- Past generations (founders of organisations);

- Academics;
- Competitors;
- NGOs or activists – considered individually, stakeholder representatives;
- Stakeholder representatives such as trade unions or trade associations of suppliers or distributors;
- Financiers other than stockholders (debt holders, bondholders, creditors);
- Competitors;
- Government, regulators, policymakers.

It is important to get a deeper understanding of the importance of stakeholders, who they are and the role they play in revenue management for beneficiary communities. An awareness of possibly raised expectations is crucial when engaging with stakeholders and potential beneficiaries (Wlokas *et al.*, 2012). For the purpose of this study, the term "stakeholder" includes all parties directly or indirectly associated with or influencing revenue management for beneficiary communities and would therefore require a strategic management approach.

2.12.3 The Value of Managing Stakeholders

The purpose of stakeholder management is to create methods of managing the different groups and relationships that result in a strategic fashion. Further, Freeman (1984) thinks that the idea of stakeholders, or stakeholder management, or a stakeholder approach to strategic management, suggests that managers must formulate and implement processes which satisfy all and not only those groups which have a stake in the business (Freeman, 1984). A stakeholder approach is mainly concerned with active management of the business environment, relationships, and the promotion of shared interests in order to develop business strategies (Fontaine, 2006). Organisations that create and sustain stakeholder relationships based on mutual trust and co-operation will have a competitive advantage over those that do not. This is known as the normative approach (Farrington, 2009). Managers who do not devote time and resources to their stakeholders might have reason to find that the commitment of their stakeholders is in doubt (Phillips, 2004).

2.12.4 Key Stakeholders in Beneficiary Revenue Management in the RSA Renewable Energy Sector

In 2003, the White Paper issued by the Department of Minerals and Energy listed a number of key stakeholders in the renewable energy sector. These included the renewable energy industry, industry in general, electricity utilities, independent power producers, provincial governments and local governments (as provided for in the Constitution), state owned enterprises and institutions, communities, non-governmental organisations and consumer forums (Department of Minerals and Energy of the Republic of South Africa, 2003). Stakeholder theory, which holds that, in order to maximise the value of the company, managers ought to pay attention to stakeholder relationships, which in turn will have positive consequences for the management of revenue for beneficiary communities in the renewable energy sector.

From the discussions above on renewable energy and stakeholder theories, it can be concluded that stakeholder theory assists in identifying the key, community beneficiary stakeholders in the renewable energy sector, and why care should be taken to manage them effectively. The discussion below addresses the relationships of the beneficiary communities and how they affect the successful management of revenue.

2.12.5 Key beneficiary community stakeholders

It is as important to consider the different local stakeholders, and the economic, social and political relationships between them. The acceptance or rejection of the project by the local population can make the implementation of a renewable energy project and its contribution to local sustainability either a success or a failure.

Therefore, a wide array of stakeholders and their mutual relationships should be considered when implementing a project (Del Rio & Burguillo, 2008).

According to Tait, Wlokas and Garside (2013b) the design and implementation of development initiatives in the renewable energy sector concerning the same beneficiaries requires careful planning and collaboration between all stakeholders. Multiple perspectives and insights are needed to understand the experiences and challenges the industry is facing, and how best they can be supported in delivering community development benefits (Tait *et al.*, 2013b). Stakeholders include Government and the private sector, non-governmental organisations as well as members of communities engaged with renewable energy projects (Wlokas, 2015). For the purpose of this research, the focus of the study is on three, key stakeholder relationships that affect revenue management for beneficiary communities.

2.12.6 The Independent Power Producers (IPPs) as Stakeholders

The IPP stakeholder group is difficult to identify and, at the same time, is one of the most powerful actors in this context (Wlokas, 2015). A consortium of companies generally develops a project together and it is during this phase that one specific company usually presents itself to the public as the project developer (Wlokas, 2015). After bid approval, projects are often sold and it is subsequently more difficult to identify who is in charge of which part of the project because IPPs establish a special purpose vehicle (SPV). In many cases, a company represented in the SPV is referred to as the project owner and is therefore responsible for the implementation of SED, ED and local ownership. Designing private sector, renewable energy projects with a community benefit component is a new and innovative approach in South Africa and, as with any new approach, there are inherent risks and challenges to overcome relating to the project developer and the community, particularly in the early stages of planning (Wlokas *et al.*, 2012).

The procurement programme requires independent power producers (IPPs) to contribute to various economic development criteria, including four criteria focusing on the local communities in which renewable energy projects are located (Tait *et al.*, 2013b). These four criteria are: local job creation, local ownership, economic development, and socio-economic development (Tait *et al.*, 2013a). Key challenges faced by the IPPs include (Tait *et al.*, 2013a):

- Defining and selecting local communities:
  The REIPPPP stipulates that communities within a 50km radius of the project must benefit. However, this leads to overlapping beneficiary areas. The bidding stage, therefore, is dominated by uncertainty about who is developing projects and where, and defining which areas should benefit. Communication with local communities and management of their expectations also requires great sensitivity.

- Alignment of the community engagement process with the project development cycle:
  The requirement to submit a socio-economic development plan with the bid makes it difficult to carry out participatory community needs assessments and development planning. The realities of procurement mean that many proposed projects are left without approval; and depending on the projects' financial set up, monetary benefits for communities might only occur years after project installation. This hinders community development planning.

- Realising community benefits in the context of REIPPPP:
  Developers lack feedback on the socio-economic development plans they submit. Feedback could improve the quality of the plans and raise developmental ambitions. For example,, projects being developed on community-owned land have not received any special recognition in the procurement programme so far. The competitive nature of the procurement process also deters collaboration on community development among bidders who are developing projects in the same area.

- Community engagement and the relationship-building process:
  The procurement process makes building positive relationships with communities difficult, given its timing and requirements. Differing legal interpretations of criteria and requirements confuse stakeholders and make

communication challenging. The roles and responsibilities of local government also differ from project to project, as no guidance is provided. This is complicated further by overlapping beneficiary areas. The 50km radius creates artificial boundaries, often dividing municipal areas or even towns or villages.

Companies have limited capacity and experience available and are still learning while implementing the SED and ED projects (Wlokas, 2015). The engagement with community development turns into an onerous task when the construction phase begins and it is at this point that companies have to commence the required monitoring and reporting (Wlokas & Ellis, 2013). Quarterly reports have to be generated by the IPPs regarding the employment numbers and SED and ED spending achieved. This is monitored by the IPP Office in the RSA Department of Energy to ensure that the project remains compliant by meeting its promised economic development obligations and reporting these accordingly (Wlokas, 2015). According to the International Finance Corporation (IFC), companies that have grasped the importance of actively developing and sustaining relationships with affected communities and other stakeholders throughout the life of their project, and not simply during the initial feasibility and assessment phase, are reaping the benefits of improved risk management and better outcomes on the ground (International Finance Corporation, 2007).

2.12.7 The Local Community Members as Stakeholders

The United Nations Programme sums up the local community as communities represented by local charities and voluntary and community groups (Krick, Forstater et al., 2005). However, it is difficult to identify the local community surrounding RE facilities clearly and, therefore, Franke and Guidero (2012) suggest that meetings with members of the community through town hall gatherings and focus groups offer an important avenue for implementing agencies to identify local stakeholders. Moreover, focused consultations with area experts and academics will provide useful information concerning the local context (African Development Bank, 2001).

However, potential stakeholders in development projects include governmental organisations, civil society organisations, non-governmental organisations, businesses, communities, academia, and religious organisations, all of whom have different levels of influence on, and importance to, the design, implementation and effective delivery of the project (Franke & Guidero, 2012).

The procurement documents define local communities as “settlements within a 50km radius of the project site” (DoE, 2011:98). It is the responsibility of the project developer to decide what constitutes the beneficiary community – this could be a specific village or neighbourhood, or even the entire (eligible) population within the 50km radius. Since the economic development requirements are driven by the BBBEE Act, previously disadvantaged citizens are considered to be primary beneficiaries (Wlokas, 2015). Wlokas, Boyd and Andolfi (2012), however, identify the local community as being what lies within the 50km radius, which includes non-governmental and community-based organisations, churches, small projects, government departments of social development, and municipalities. Individual meetings with traditional leaders, community leaders, active citizens, entrepreneurs and owners of small businesses also need to be conducted (Wlokas *et al.*, 2012). The identification of beneficiary communities is problematic for two reasons (Wlokas, 2015):

- Social and political dynamics can be negatively affected by selectively identifying some people as beneficiaries rather than others;
- Also, the 50km radius competes with other administrative boundaries because such a radius can stretch over one or more municipal areas and can even cross provincial and national boundaries, which makes the alignment of SED plans with government policies difficult.

However, this could be overcome to some extent by assessing the needs of beneficiary communities. This is discussed in the following section.

2.12.8 Assessing the Needs of the Local Community as a Stakeholder

Developing a plan to identify local needs and resources can help change-makers understand how to improve their communities in the most logical and efficient ways possible (Wikin & Altschuld, 2016). One goal of a community assessment is to develop an informed understanding of the needs that exist within a community and the effect they might have on the community's members (May *et al.,* 2010). Community needs can affect a large or small number of a community's members including anyone who claims membership in the community such as: families, individuals, youth, seniors, parents, businesses, community organisations, faith-based organisations (May *et al.*, 2010).

Another goal of a community assessment is to develop a detailed analysis of community assets or resources that currently exist in the community and can be used to help meet community needs (May *et al.*, 2010). Any positive aspect of the community that can be used to develop effective solutions is an asset such as: organisations, people, partnerships, facilities, funding, policies, regulations, and a community's collective experience (May *et al.*, 2010). In order to assess the assets and needs of a local community, the World Bank advocates what is referred to as a beneficiary assessment (BA). This is a qualitative research tool, which is used to improve the effect of development operations by gaining the views of intended beneficiaries regarding a planned or on-going intervention (World Bank, 2002). Researchers within the context of local communities in RSA, therefore, recommend that an asset mapping and needs assessment process be conducted, but caution that undertaking a community needs assessment and planning process without undertaking broader participatory processes with communities is not an effective form of long-term development (Tait *et al.*, 2013b).

2.12.9 Local Community Trusts as Stakeholders

As mentioned in this chapter, as part of the terms of the economic development obligations that RE companies have, local communities must have ownership in the

RE company. South Africa’s National Treasury Toolkit for Tourism defines a community trust as a “not-for-profit trust created in terms of applicable law by volunteer members for the purpose of channelling the proceeds of various activities and investments for the common good of persons ordinarily resident within a specific town, village or settlement” (National Treasury Toolkit for Tourism, 2005: 3)

The local ownership requirement results in dividend revenue that is earned by local communities (Tait *et al.*, 2013a). A community trust is established to manage the shareholding asset on behalf of the community and governs spending decisions on developmental goals (Tait *et al.*, 2013a). The trust is managed by a board of trustees constituted of representatives from the community, independent power producers and other independent members (Tait *et al.*, 2013a). Community trusts are currently the predominant governance structure being used to manage funds in the REIPPPP (Tait *et al.*, 2013a). A community trust is an entity, which governs assets on behalf of a defined beneficiary group, and is a common choice of legal vehicle for community development in South Africa (Tait *et al.*, 2013a). There were, however, many criticisms made by government, IPPs and development practitioners about these structures as a governance mechanism to guarantee successful community development (Tait *et al.*, 2013a). It is, therefore, important to treat a community trust as a key stakeholder for the following reasons pointed out in the Tshikululu Social Investments Report (2010) on Beneficiary Trusts in RSA:

- To ensure adequate representation of the beneficiary community on trust boards. Even with the best of intentions, it is difficult to ensure that representatives will communicate consistently and effectively, and represent community interests in an impartial manner;
- To avoid poor communication with stakeholders;
- To address challenges in delineating community boundaries and working in communities with no common identity or mobilisation of which to take advantage;
- To address the fragility of community institutions that rely on people’s voluntary commitment, which often results in high turnover rates. Operational challenges such as project management, sub-contracting consultants, financial oversight, monitoring, evaluation and reporting, and stakeholder

consultation all require dedicated and skilled personnel. Administration of trusts requires dedicated, paid employees.

It is these roles and challenges that make a community trust an important stakeholder in revenue management for beneficiary communities.

2.12.10 Local Government as a Stakeholder

Local municipalities are a key stakeholder in local development processes but stakeholders comment that it is unclear what role they should play or how they should be included (Tait *et al.*, 2013a). For example, it is questioned whether local municipalities should be included in the formation of trust structures or what the appropriate level of alignment with Integrated Development Plans (IDPs), and Local Economic Development (LED) strategies should be (Tait *et al.*, 2013a). This relationship with municipalities also becomes more complicated when beneficiary areas cover more than one municipal area and multiple stakeholders must be co-ordinated. As one provincial municipal representative noted, a more collaborative approach rather than many individual processes would be beneficial to create synergies and better outcomes (Tait *et al.*, 2013a). Also, municipalities often suffer from critical skills shortages and a lack of human capacity. This can act as a significant barrier to fostering effective partnerships. However, as pointed out by a provincial representative, excluding these stakeholders could result in their being unco-operative and making project development processes in their jurisdictions more difficult (Tait *et al.*, 2013a).

2.13 Summary

The review of literature in this chapter produced an overview of the advantages and disadvantages of various sources of renewable energy in the world, the BRICS countries, and Africa respectively. In particular, the unique obligations placed on the renewable energy sector in South Africa to contribute to the socio-economic development of surrounding communities are discussed. The social and economic challenges of these obligations are examined with a view to developing a theoretical model of managing revenue for beneficiary communities of the RE sector in South Africa.

Renewable energy is acknowledged as a solution to energy poverty and climate change around the world and the largest additions to global capacity so far were made in 2015. This upward trend in the use of renewable energy sources has been driven by increased global investment in the sector.

If just 1% of the earth's solar energy capacity could be converted into electricity with 10% efficiency, it would be four times larger than the world's total electricity generating capacity. However, wind energy is the fastest growing technology today and, of the low-carbon energy generation technologies, wind power generation has emerged as the technology of choice. Hydro-power today is an extremely flexible power technology with one of the best conversion efficiencies of all energy sources. However, power plants are site specific and power generation is subject to seasonal cycles.

There has been rapid expansion of renewables in the BRICS countries with China, Brazil, India and South Africa being in the top 10 investing countries. In Brazil, job creation has been the primary aspect of economic development resulting from renewable energy but there are no direct, socio-economic benefits to the communities surrounding renewable energy facilities.

Russia is the fifth largest producer of renewable energy in the world but, according to the literature, there does not appear to be a direct link between the installation of renewable energy sites in Russia and socio-economic and economic development after the construction phase of the plants.

India was the first country in the world to set up a ministry of non-conventional energy resources in the early 1980s. The renewable energy sector employs almost 0.5 million people but there is no evidence that there is a focus on SED and ED projects in the same manner that is required in RSA.

China has become a global leader in renewable energy. The socio-economic benefits have included increased income, industrial development and job creation

In Africa, renewable energy resources are plentiful, including solar, wind, biomass, geo-thermal and hydro. Africa is particularly rich in solar energy potential with most of the continent enjoying an average of more than 320 days of bright sunlight per year. However, except in South Africa, there is no direct link between the establishment of renewable energy sites in Africa and the socio-economic development of communities surrounding the sites.

South Africa occupies a central position in the global debate regarding the most effective policy instruments to accelerate and sustain private investment in renewable energy The IPP Procurement Programme has been designed to contribute towards a target capacity of 725 megawatts and to stimulate socio-economic and environmentally sustainable growth in the renewable energy industry in South Africa. However, not much thought and planning was given to how this would work practically. The renewable energy companies are required to submit project proposal bids that contain elements of economic development as well as pricing. This posed a particular challenge for bidders who were not familiar with the needs of the communities surrounding the proposed renewable energy sites.

In view of the importance of economic development in South Africa and the significant position of renewable energy companies in particular, the absence of empirical evidence on the management of revenue for beneficiary communities presents an important gap in research literature. From this section of the literature review, it was possible to define SED and ED and examine the terms and challenges facing the RE sector. Further, the following factors were identified that could affect the perceived success of managing revenue for beneficiary communities of the RE sector in South Africa:

- The unique obligations placed on RE companies in South Africa whose core business is not socio-economic development.

- The requirement to make a percentage revenue contribution to beneficiary communities and to manage the spending of these funds on appropriate SED and ED projects.
- The equitable distribution of revenue amongst identified beneficiary communities within a 50km radius of a renewable energy project site.
- The management of community trust shareholding in RE companies.
- The importance of identifying stakeholders and managing their influence and expectations.

In Chapter 3, revenue management systems used worldwide are reviewed, particularly those aimed at socio-economic and enterprise development, as well as international approaches to revenue management on behalf of beneficiary communities. More specifically, Chapter 3 includes a review of revenue management for beneficiary communities in the renewable energy sector in RSA.

Chapter 3
Managing Revenue for Beneficiary Communities

3.1 Introduction

In this chapter, revenue management systems used worldwide are reviewed, particularly those aimed at socio-economic and enterprise development. International approaches to managing revenue for beneficiary communities are considered, including corporate social responsibility which is very closely linked to SED and ED. More specifically, Chapter 3 includes a review of approaches to managing revenue for beneficiary communities in the renewable energy sector in RSA. Key concepts are discussed as well as their effect over the twenty-year lifespan of renewable energy facilities towards 2035. The key principles of revenue management applied worldwide are examined with a view to developing a model that is specifically applicable to renewable energy companies that are obligated, through their Implementation Agreement with the RSA DoE, to spend a percentage of revenue on SED and ED in beneficiary communities.

3.2 Global Definitionsof Revenue Management

Revenue management, also known as yield management, is an essential instrument for matching supply and demand by dividing customers into different segments based on their purchase intentions and allocating capacity to the different segments in a way that maximises a particular firm's revenues (El Haddad, Roper & Jones, 2008). Kimes (1989), and Kimes and Wirtz (2003) define revenue management as the application of information systems and pricing strategies to allocate the right capacity to the right customer at the right price at the right time. Revenue management is concerned with such demand management decisions and the revenue management methodology and systems required in making them (Talluri, van Ryzin, Karaesmen & Vulcano, 2008). It involves managing the firm's interface with the market, as it were, with the objective of increasing revenue (Talluri *et al.*, 2008). In both of these definitions, revenue management is primarily concerned with products and services where profitability is the key driver. In the current research study, revenue management refers to managing revenues on behalf of beneficiary communities to enable development, growth and a move towards sustainability. The revenue management obligations of the RE sector in RSA is closely linked to the Corporate Social Responsibility (CSR) and obligations of private companies. According to Wlokas *et al.* (2012), the approach of the REIPPP is similar to the BEE strategy, since it is state-led and aims to contribute to sustainable socio-economic growth (Wlokas *et al.*, 2012). Furthermore, the REIPPPP works with an economic development scorecard, which is guided by the generic balanced scorecard of BEE and, hence, the programme can work as a driver for the private sector to foster socio-economic development within historically disadvantaged communities (Tait, 2011).

3.2.1 Global Perspective on Revenue Management and Corporate Social Responsibility (CSR)

The World Bank's definition of Corporate Social Responsibility (CSR) is the commitment of business to contribute to sustainable economic development by working with employees, their families, the local community and society at large to improve quality of life in ways that are both good for business and good for development (Halina, 2004). The United Nations defines CSR as the integration of business operations and values, whereby the interests of all stakeholders including investors, customers, employees, the community and the environment are reflected in the company's policies and actions (United Nations, 2015). The Global Reporting Initiative provides the standard framework for CSR reporting used around the world in which there are three pillars to CSR reporting (Rasmussen, 2015):

- Economic: The philanthropic and economic practices of giving back to both internal and external communities that serve the organisation. Communities can be geographic, employees, partners, clients, vendors, etc.;

- Environmental: The environmental and sustainability practices of the organisation to protect and steward resources needed wisely to operate the business and the communities in which it operates;
- Social: The respect and concern for individuals and property in the communities that serve or service the organisation.

The United Nations Global Compact (UNGC), the world's largest voluntary corporate citizenship initiative, questions the business practices of transnational companies in emerging markets that have been cultivated in areas renowned for deficient economic, political, and social frameworks that can lead to low thresholds for ethical behaviour and accountability in business (D'Amato, Henderson & Florence, 2009). The principles of the UNGC were derived from the Universal Declaration of Human Rights, the International Labour Organisation's Fundamental Principles of Rights at Work, and the Rio Principles on Environment and Development (Aletter, von der Burg, Zanell, Molewa, Westerwelle, Niebel, Boddenberrg & Conze, 2010). The ten principles of the UNGC, therefore, would also be applicable in the context of the RE sector regarding corporate social responsibility in RSA, and would provide a basis for any kind of revenue management for beneficiary communities. The Ten Principles of the United Nations Global Compact are (UN Global Compact, 2010):

- **Human rights**
  - Principle 1: Businesses should support and respect the protection of internationally proclaimed human rights; and
  - Principle 2: make sure that they are not complicit in human rights abuses.

- **Labour**
  - Principle 3: Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining;
  - Principle 4: the elimination of all forms of forced and compulsory labour;
  - Principle 5: the effective abolition of child labour; and
  - Principle 6: the elimination of discrimination in respect of employment and occupation.

- **Environment**
  - Principle 7: Businesses should support a precautionary approach to environmental challenges;
  - Principle 8: undertake initiatives to promote greater environmental responsibility; and
  - Principle 9: encourage the development and diffusion of environmentally friendly technologies.

- **Anti-Corruption**
  - Principle 10: Businesses should work against corruption in all its forms, including extortion and bribery.

3.3 European Union Perspective on Revenue Management and CSR

The European Commission (2011: 1) has previously defined Corporate Social Responsibility (CSR) as “a concept whereby companies integrate social and environmental concerns in their business operations and in their interaction with their stakeholders on a voluntary basis”. CSR concerns actions by companies over and above their legal obligations towards society and the environment. Certain regulatory measures create an environment more conducive to enterprises voluntarily meeting their social responsibility (European Commission, 2011). Finally, the European Union defines CSR as “… the concept that an enterprise is accountable for its impact on all relevant stakeholders. It is the continuing commitment by business to behave fairly and responsibly and contribute to economic development while improving the quality of life of the work force and their families as well as of the local community and society at large…” (Mazurkiewicz, 2004: 5).

Through CSR, enterprises can contribute significantly to the European Union’s treaty objectives of sustainable development and a highly competitive social market economy (European Commission, 2011). CSR underpins the objectives of the Europe 2020 strategy for smart, sustainable and inclusive growth, including the 75%

employment target (European Commission, 2011). European countries' laws require companies to report on their social and environmental performance (Hohnen, 2012). On 13 March 2007, the European Parliament adopted a resolution on CSR in which it expressed the view that "increasing social and environmental responsibility by business, linked to the principle of corporate accountability, represents an essential element of the European social model" (Hohnen, 2012: 17). The European Academy of Business in Society is an alliance of companies, business schools and academic institutions that, with the support of the European Commission, is committed to integrating business-in-society issues into the heart of business theory and practice in Europe. It seeks to help shape and enhance the quality of debate on the role of business in society in Europe, and to increase the capacity of business leaders to put business-in-society at the heart of the way companies are run (Hohnen, 2012).

3.4 African Perspective on Revenue Management and CSR

Forstater, Zadek, Guang, Yu, Hong and George (2010), in an article on Corporate Responsibility in African Development, report that the idea that business is part of society and, therefore, has community and national responsibilities is established in the culture, as well as the economic history of many African countries. This, combined with the influence of multinationals and international institutions such as the UN Global Compact, means that CSR is being carried out by both local businesses and foreign investors, and is encouraged increasingly by many governments (Forstater *et al.*, 2010). Surveys of CSR amongst businesses in Africa have found that the most common approach to CSR issues is through philanthropic support focusing, in particular, on education, health and environment (Forstater *et al.*, 2010).

According to Klins *et al.* (2010: 2), CSR is still in its infancy in Africa and is seen as an agenda of the North imposed on countries of the South (Nyahuye, 2012). This has been grounded within the African context and is used to address a continent's economic, social and sustainable developmental challenges (Nyahuye, 2012). Socio-economic realities in conjunction with weak public administration and service delivery have a notable effect on the function of CSR for companies operating in Africa (Nyahuye, 2012). Visser *et al.* (2010: 133), however, note that the drivers of CSR in developing countries are mainly influenced by tradition since they draw strongly on deep-rooted, indigenous, cultural traditions of philanthropy. Nyahuye (2012) highlights the communal culture of traditional philanthropy through African traditional concepts such as:

- Harambee: Winston & Ryan (2008: 212) note that this signifies and reflects strong, ancient values of mutual assistance, joint effort, social responsibility and community self-reliance. It is guided by the principle of collective good rather than individual gain;
- Tsekada: Ararat (2006: 6) contends that this is about behaving as a righteous person and fulfilling obligations to society;
- Ubuntu: Nussbaum (2003: 21) notes that this is especially relevant in Southern Africa by reflecting an interdependent, community culture thereby meaning that a person can only function through other people;
- Zekat: Visser and Tolhurst (2010: 133) note that this is directly translated as alms to the poor.

Nyahuye asserts that these concepts are now associated with medium to large companies especially multinationals (Nyahuye, 2012). Skinner and Mersham (2008: 239), observe that the on-going development of CSR on the African continent owes much to developments in South Africa.

3.5 RSA Perspective on Revenue Management and CSR

Different mechanisms for promoting CSR exist in RSA and range from voluntarily codes of conduct to international regulations and binding regulations such as the Constitution of the Republic of South Africa, Act 108 of 1996 as well as the Broad-Based Black Economic Empowerment Act 53 of 2003 (Aletter *et al.*, 2010). The King III Report on Corporate Governance (South Africa, 2009), which promotes good social and environmental practices as part of good corporate governance, is closely oriented to the standards of international corporate governance (Aletter *et al.*, 2010). The JSE Securities Exchange prescribes compliance with the King III Report to their listed companies. A set of criteria was developed by the King Commission from a multitude of documents which include the Ten Principles of the United Nations Global Compact and more than 50 companies have decided to adhere to the criteria in line with the JSE´s Socially Responsible Investment Index of 2005 (Aletter *et al.*, 2010).

In RSA, state legislation plays a central role in the development of the country's CSR agenda (Hamann, 2009). The most important document that has recently influenced and determined CSR in South Africa is the Broad-Based Black Economic Empowerment (B-BBEE) Act of 2003 (Njenga & Smit, 2007). The fundamental objective of the Act is to advance economic transformation and enhance the economic participation of black people in the South African economy (Wlokas *et al.*, 2012). According to the Act, ”black people” is a generic term which means Africans, Coloureds and Indian South African citizens. B-BBEE means the economic empowerment of all black people including women, workers, youth, people with disabilities and people living in rural areas through diverse but integrated socio-economic strategies (RSA, 2004).

CSR movements and initiatives have emerged in countries such as China, India, South Africa, the Philippines and Brazil among others, and the governments of some middle-income countries facing major social challenges have explicitly sought to engage business in meeting those challenges, as with Black Economic Empowerment in South Africa (Halina, Wilson & Zarsky, 2007).

3.6 Sources of Revenue to Benefit Communities In the RSA RE Sector

3.6.1 Socio-Economic Development (SED) Funding

IPPs are required to contribute a percentage of projected revenues accrued over the 20-year operational life of a project to SED initiatives (IPP Office, 2015). The minimum compliance threshold for SED contributions is 1% of revenue with a target of 1.5% over the 20-year operational life of a project (IPP Office, 2015). Across the six bid windows, a total contribution of R19.2 billion has been committed to SED initiatives. Assuming an even, annual revenue spread, the average contribution per year would be R962 million and, of the total commitment, R15.2 billion is specifically allocated for local communities where the IPPs operate (IPP Office, 2015).

3.6.2 Enterprise Development (ED) funding

As with SED funding, enterprise development commitments are made as a percentage of revenue and, as such, obligations are effective only once an IPP starts operations. The target for IPPs to spend on enterprise development is 0.6% of revenues over the 20-year operational life of a project (IPP Office, 2015). Again, assuming an equal distribution of revenue over the 20-year operational life of a project, enterprise development contributions would be R301million per annum (IPP Office, 2015). Of the total commitment, R4.5 billion is committed directly to the local communities where the IPPs operate, contributing significantly to local enterprise development (IPP Office, 2015).

3.6.3 Community Ownership Funds (Dividends)

A minimum of 2.5% ownership of an IPP by local communities is required as a procurement condition. In this way, a substantial portion of the investments have been structured and secured as local community equity. Dividends earned by an individual community will depend on the terms of each transaction corresponding with the relevant equity share (IPP Office, 2015). Shareholding for local communities has been structured through the establishment of community trusts, which will receive R29.2 billion net income over the 20-year life of the projects (IPP Office, 2015). The bulk of the money, however, will only start flowing into the communities from 2028 because of the repayment obligations to development funding institutions in the preceding years (IPP Office, 2015).

3.7 Models of Revenue Management for Corporate Social Responsibility that can be Considered for the RE Sector

A number of revenue management models exist worldwide that could be used or adapted for renewable energy companies in RSA to manage obligations to beneficiary communities better. Revenue management includes a variety of processes, actions, and techniques sometimes difficult to summarise (Ivanov, 2014).

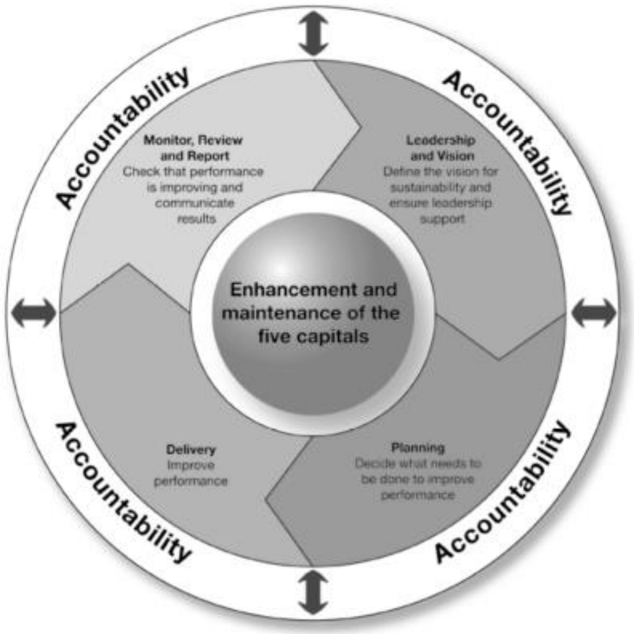
3.7.1 The SIGMA Management Model

The Sustainability-Integrated Guidelines for Management (SIGMA) are the key output from a four-year, multi-stakeholder project to provide practical, yet comprehensive, guidance to organisations seeking to improve their sustainability and CSR management and performance (Jonker & De Witte, 2006). The SIGMA Guidelines consist of two main parts (Jonker & De Witte, 2006):

- Guiding principles: to support the development of organisation-specific principles and enable practitioners to understand what their organisation might look like if it were sustainable;
- Management framework: to enable a systematic approach to be taken to the development, delivery, monitoring and communication of an organisation’s sustainable development strategy and performance.

The SIGMA Management Framework is the core of the model and is shown in Figure 3.1. It follows the widely used "Plan, Do, Check, Act" model, represented by four phases: Leadership and Vision; Planning; Delivery; Monitoring, Reviewing and Reporting (Jonker & De Witte, 2006). This enables alignment to established management processes, systems and standards but it does not specify a method of application; moreover, it provides a flexible, yet systematic, structure for CSR management activity (Jonker & De Witte, 2006).

Figure 3.1: The SIGMA Management Framework



Source: Jonker & De Witte (2006)

Activities of the leadership and vision phase support the development of an organisation's identity and leadership needs, and enables it to understand and develop a vision of what it might look like if it were sustainable. The planning phase guides the development of systems and prioritisation of activities, confirming the changes needed (Jonker & De Witte, 2006). The delivery phase is concerned with delivering the business proposition, implementing the CSR programme while maintaining and enhancing natural, social, human, manufactured and financial capital, and being accountable (Jonker & De Witte, 2006). The monitoring, reviewing and reporting phase is about checking progress, learning and adapting as well as reporting progress transparently (Jonker & De Witte, 2006). The key differentiator of SIGMA from other management approaches is that SIGMA is underpinned by the guiding principles of the five capitals and accountability, which provide the basis for all CSR activity (Jonker & De Witte, 2006).

Tables in the guidelines for each phase provide the how, what, when, why and who of CSR management, including suggested activities on which to focus: key questions to ask; suggestions for who needs to be involved; potential timing for activities; expected outcomes; further resources, as well as hints and tips to assist with implementation, mapping of what is already under way, and establishing what is required (Jonker & De Witte, 2006). The term ”capital” is used to represent the use of the stocks of these five assets, which together provide the foundation of any successful enterprise and reflect its overall impact and wealth (Jonker & De Witte, 2006). Table 3.1. summarises the five capitals (Jonker & De Witte, 2006).

Table 3.1: The five capitals

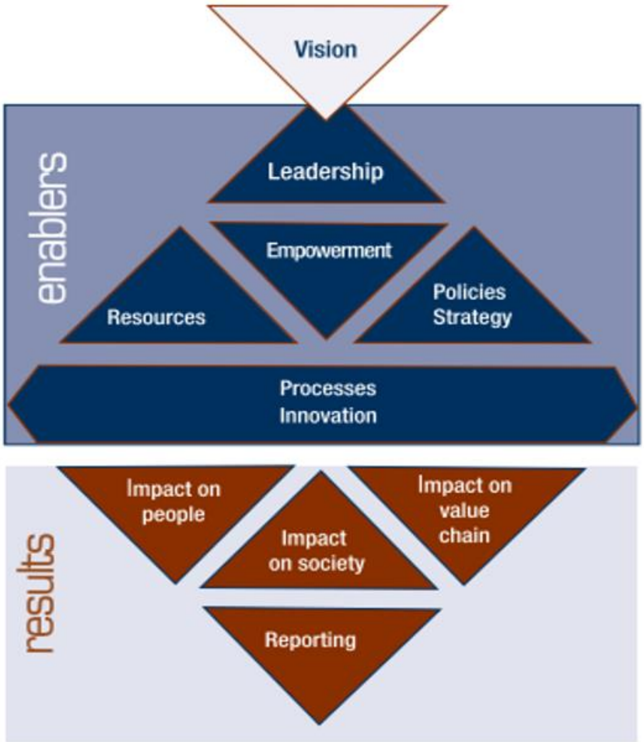
The five capitals	Maintaining and enhancing each capital
1. Natural capital **The ecological foundation for the other capitals. Natural capital cannot be traded off against the other capitals.**	Understand, monitor and manage resource inputs and the outputs and impacts generated. Operate within the boundaries of natural cycles and systems. Consider resource reduction and substitution, eco- efficiency, use of renewables, respect for and protection of biodiversity.
2. Human capital **The ability of the individual to contribute to organisational success and have their potential fulfilled.**	Aim for healthy, motivated and skilled workforces doing varied and satisfying work in learning environments. Ensure fair treatment and wages, respect for basic human rights and cultural differences, safe environments and the encouragement of identity, empathy and creativity.
3. Social capital **The value added by relationships, organisations, networks, partnerships and collaboration.**	Maintain an organisation’s licence to operate within societal structures. Work towards community development, ethical sourcing of supplies, consistent public policy positions, fair payment of taxes, respect for law, the rejection of corruption and the adoption of transparent and fair governance systems.
4. Manufactured capital **Any fixed assets, such as buildings, goods and infrastructure owned leased or controlled by the organisation.**	Utilise technology, infrastructure and systems in the efficient use of resources. Consider closed loop manufacturing systems, leasing services, zero-waste and emissions approaches and sustainable design.

5. Financial capital **Existing in the form of tradable currencies, it should reflect the value of the other capitals (rather than being a true capital in its own right)**	Publish financial accounts. Consider putting financial or 'shadow' values on other capitals wherever possible Recognise the importance of non-financial measures.
Source: Jonker and Witte (2006**)**	

Practising accountability during every management phase is the other key SIGMA principle. CSR refers to the qualities of the organisation to relate to the world around it including the stakeholders who influence or who are influenced by it (Jonker & De Witte, 2006). Accountability secures a licence to operate and is fulfilled by being transparent and responsive to stakeholder needs and through complying with legislation and also voluntary commitments (Jonker & De Witte, 2006).

3.7.2 The Global Compact Performance Model

The Global Compact Performance Model is composed of ten elements of business practice (see Figure 3.2.), each of which is represented by a separate segment of the diagram (Jonker & De Witte, 2006). It is a company-driven, continuous improvement process that begins with the organisation's vision and proceeds through each element represented in the diagram below and then, based on the results obtained, begins again taking on board lessons learned to make further improvements to the company's social and environmental performance (Jonker & De Witte, 2006). Each element has tools and techniques associated with it, which the Global Compact has identified and catalogued, and which companies might find helpful as they move through the process (Jonker & De Witte, 2006).



Source: Claude Fussler (2004)

Figure 3:2: The Global Compact Performance Model

The analysis of the elements is summarised as follows (Jonker & De Witte, 2006):

- Vision: This element involves integrating a commitment to responsible corporate citizenship into the company's vision (of how it sees itself and what organisation it wants to become);
- Leadership: This step is about driving the revised vision throughout the entire company. Commitment from the top to improve social and environmental performance is crucial in effecting sustainable and effective change;
- Empowerment: Empowerment is about releasing the full potential of the organisation's people in line with the company vision and defining their role in relation to it. It is about organising, informing, showing, motivating, training, re-warding, listening to, consulting, and trusting staff so that they can play their role in helping the organisation to achieve its vision;

- Policies and strategies: This element entails reviewing the company's existing policies and strategies or developing new ones to incorporate the Global Compact principles;
- Resources: This step is about managing the means to implement the company's policies and strategies and equipping employees with what they need to achieve their targets in a way that does not compromise the company's commitment to the Global Compact principles;
- Processes and innovation: This element is about confronting dilemmas that might be posed by implementing the Global Compact principles and turning them into innovative solutions and business opportunities. It includes understanding the key processes that can create improvements, setting targets and communicating them throughout the organisation;
- Impact on the value chain: This step is focused on how the company manages its relationships with its commercial partners, including its suppliers, and the influence and effect that it has on the operations and activities of these partners;
- Impact on people: This step is about the impact of efforts to implement the Global Compact principles on the company's workforce, including employee morale. The general wisdom is that there is a positive relationship between good social and environmental performance and the company's ability to recruit and retain high quality talent, as well as higher employee productivity;
- Impact on society: The impact of the company on the communities in which it operates as well as society at large is also a key element of the Performance Model. It is about how society perceives the company. Society here encompasses local communities where the company operates, civil society organisations, rating organisations and others. It will typically be easier for a company to operate smoothly and maintain its licence to operate when local communities do not have a negative opinion of the company and instead feel that it responds favourably to their concerns and needs;
- Reporting: This step is about reliable measurement and communication of the company's economic, social and environmental performance. Specific measurements that show actual performance are essential for ensuring continuous improvement. The Global Compact has developed guidelines on

how it expects companies to communicate with their stakeholders about their progress in implementing the Global Compact principles and has introduced consequences for companies that do not regularly communicate their progress.

More than 2 400 company participants from more than 85 countries are now involved in the Global Compact's multi-stakeholder effort aimed at underpinning global markets with universal values to render them more sustainable and inclusive (Jonker & De Witte, 2006). The Performance Model might be particularly useful for companies that are not sure where to start in embarking on the continuous improvement process that is a key expectation of engagement in the Global Compact (Jonker & De Witte, 2006). Elements of the Global Compact Model can be considered in the formulation of a revenue management model for the RE sector.

3.7.3 The Guangcai Model

The name of the model comes from a Chinese poverty alleviation programme which promotes multi-sector co-operation between entrepreneurs, governments, non-governmental organisations and farmers to reduce poverty in rural areas. In essence, the Guangcai Model is a partnership between public and private sectors. In this partnership, each actor assumes a unique role (Jonker & De Witte, 2006). The Guangcai Model provides a public private partnership that is well developed and functions effectively with the key success factor being that the comparative advantages of each participant are used and the overall responsibilities and risk allocation are distributed optimally between the public and private sectors (Jonker & De Witte, 2006). A cost-benefit analysis for each partner provides a useful illustration to understand the model and its power better (see Figure 3.3). Since participating in the Guangcai project does not increase fixed costs significantly, a company is able not only to increase its profits but also to gain additional benefits. These benefits include (Jonker & De Witte, 2006):

- Access to government support: subsidies, tax reduction, reduced interest rate loans and an appropriate infrastructure;

- Political recognition and an enhanced reputation which can reduce political and business risks;
- Decreased cost of information gathering and communication as a result of the support from the NGO.

Figure 3.3: The Guangcai Model

Source: Jonker and Witte (2006)

In the Guangcai Model, the key responsibility of the government is to provide an enabling environment for the private sector through tax concessions, favourable credit facilities and adequate infrastructure (Jonker & De Witte, 2006). As for NGOs, normal cost-benefit analysis is not applicable as their goals are established in terms of social contribution rather than profits. In the Guangcai Model, NGOs work toward their appropriate goals and are making a definite contribution towards sustainable poverty alleviation (Jonker & De Witte, 2006). NGO costs are mainly for communication, operation, pre-project assessment and post-project evaluation. Compared to the value added of the entire project, these costs are not significant (Jonker & De Witte, 2006). The Guangcai Programme provides a realistic model that demonstrates the potential of corporate social responsibility based on public-private partnership (Jonker & De Witte, 2006). Based on the results achieved in China, it is felt that the Guangcai Model can be used around the world as a basis for the development of public-private partnerships that ,in the words of Kofi Annan: ”reconcile the creativity of business with the needs of the disadvantaged and the requirements of future generations” (Jonker & De Witte, 2006). This is particularly attractive to the RSA RE context since public-private partnerships have been in operation in the country for a number of years.

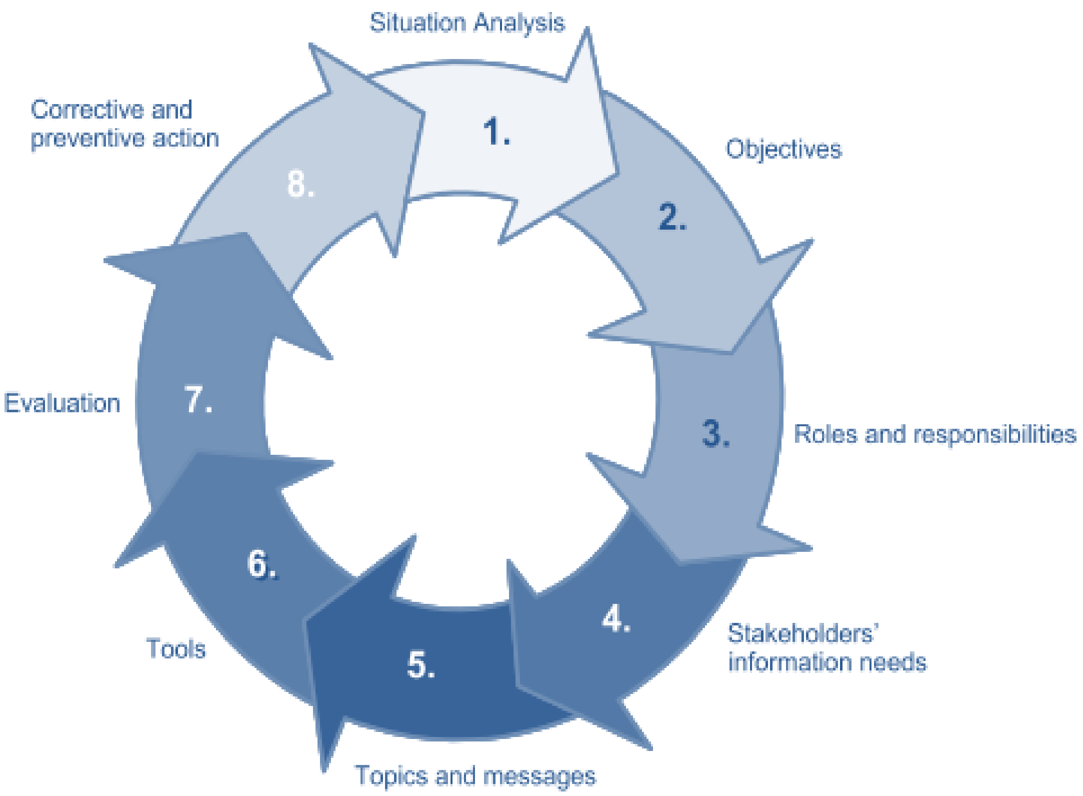
3.7.4 The Experience of Holcim: Stakeholder Engagement Model

The model is used by Holcim Group companies to assist in preparing, implementing and evaluating their local stakeholder engagement strategies; it details the cyclical process of engaging with stakeholders step-by-step. Each step contains basic principles, tools and mechanisms that should be applied (Jonker & De Witte, 2006). It delivers a consistent approach across worldwide organisations, yet is born of hands-on practice in the field (Jonker & De Witte, 2006). The essence of the model is the checklist approach, which enables local management to proceed logically from step to step whilst applying the recommended tools, which supplement the model at each stage of the process (Jonker & De Witte, 2006):

- Analyse situation: What is the current situation from the company’s perspective and from the stakeholders’ perspective?
- Define objectives: What do you want to achieve? Are the objectives measurable?
- Outline internal roles and responsibilities: Who should do what and why?
- Map stakeholders and assess their needs for information. Who are your stakeholders? What are their needs and expectations?
- Develop key messages on relevant topics to meet these needs. Has their understanding been tested with the chosen audience?
- Use the most appropriate engagement method for stakeholders e.g. dialogue (group or one-to-one), community advisory panel, public hearing, focus group etc. Are you well prepared for the actual engagement event?
- Evaluate engagement plan: Were the stated objectives achieved?

- Invest in corrective or preventive action: Will some stakeholder recommendations be acted upon? Will aspects of strategy be changed to meet stakeholder needs better?

Figure 3.4: Engagement Process Cycle



Source: Jonker and Witte (2006)

The Holcim Group Model is based on experience in the field, which has shown that on-going direct engagement with stakeholders is essential to ensure their active involvement, for example, during the lifecycle of a community project. In that way, the priorities, skills and resources of Holcim are best matched with the community's needs, described as follows (Jonker & De Witte, 2006): Firstly, a formal, stakeholder "needs assessment" is undertaken to ensure that the right information is collected in the most efficient way, usually by means of document reviews, surveys, focus groups and interviews (Jonker & De Witte, 2006). Wherever possible, and when acceptable to stakeholders, facilitation of focus group discussions or individual interviews is undertaken by an independent, yet internal specialist from Holcim Group headquarters (Jonker & De Witte, 2006).

The Holcim experience shows that implementing local solutions according to a global methodology is a powerful tool. It makes it possible to engage with stakeholders covering a diverse spectrum of cultures, languages, and aspirations (Jonker & De Witte, 2006).

3.8 Revenue Management Obligations Facing the RSA Renewable Energy Sector with regard to SED and ED.

3.8.1 Legal Requirements

3.8.1.1 The Implementation Agreement (IA)

According to the RSA Public-Private Infrastructure Advisory Facility (PPIAF), the standard implementation agreements included in the request for proposals packages for eventual signature by the DoE and the winning bidders, lay out an elaborate system of performance rewards and penalties based on the quarterly reporting by contractors. Performance against each economic development commitment is measured using formulas included in a schedule to the IA (Eberhard, 2014). Performance credits or penalties are determined quarterly for each sub-component, then added together at the end of the measurement period, being the construction period and each 12-month period thereafter (Eberhard, 2014). This determines whether or not the contractor owes the DoE penalty payments for under-performance during the period. Over-performance is used only to off-set under-performance (Eberhard, 2014). In addition, under-performance during a quarter can result in *termination points* if performance scores are below designated thresholds in the IA. If contractors do not respond in a satisfactory way to correct the cause of each termination point, the points are added together at the end of the measurement period. If the total exceeds designated thresholds, the DoE is entitled to terminate the agreement (Eberhard, 2014).

3.8.1.2 The Power Purchase Agreement (PPA)

A power purchase agreement is a contract between two parties: one who generates electricity for the purpose (the seller), and one who is looking to purchase electricity (the buyer), (Thumann, 2009). The PPA defines all of the commercial terms for the sale of electricity between the two parties, including when the project will begin commercial operation, the schedule for delivery of electricity, penalties for under delivery, payment terms, and termination (Thumann, 2009). A PPA is the principal agreement that defines the revenue and credit quality of a generating project and is thus a key instrument of project finance (Thumann, 2009). In the context of this research, the purchaser is ESCOM, South Africa's power utility established by the government. Revenue is derived from the sale of electricity to ESCOM and, as such, this influences the amount of revenue that is available for SED and ED funds.

3.9 Revenue Management Capacity and Skills in RSA

Common issues affecting long-term, community governed structures include high staff turnover, intrusion of local politics, and inadequate capacity and skills in such institutions (Tshikululu, 2010; De Beer & Swanepoel, 1998). The REIPPP assigns renewable energy companies with the difficult task of creating local developmental benefits in an effort to reduce the weight of structural and systemic issues of poverty and inequality. Companies, however, lack the capacity and incentive to engage appropriately with issues of development planning (Wlokas, 2015). Aligning private and public sector creativity to develop long-term strategies for local community development that will enable the initial investments efforts and benefits of training and employment to continue, will require sufficient communication and collaboration between the relevant people and organisations and the capacity to ensure that the approach implemented is comprehensive and sustainable (Wlokas, 2015).

Some companies build different levels of in-house capacity; some task the engineers and commercial staff in their team with activities related to local communities; others appoint dedicated and trained staff who can include public relations or marketing staff, or community liaison officers and teams (Wlokas, 2015). The staff can be based entirely within the project company's office or be partially or fully in the project area or even on-site (Wlokas, 2015). These are just some of the factors that influence the capacity of companies to direct their thinking and action related to local community development (Wlokas, 2015).

3.10 Revenue Management through Community-Driven Development as a Possible Long-Term Solution

Community-driven development (CDD) recognises that poor people are prime actors in the development process, not targets of externally designed, poverty reduction efforts (Gillespie, 2004). In CDD, control of decisions and resources rests with community groups, who may often work in partnership with demand-responsive support organisations and service providers, including elected local governments, the private sector, NGOs, and central government agencies (Gillespie, 2004). According to the World Bank's Voices of the Poor, based on interviews with 60,000 poor people in 60 countries, poor people demand a development process driven by their communities (Narayan & Petesch, 2002). When the poor were asked to indicate what might make the greatest difference in their lives, they responded as follows (Narayan & Petesch, 2002):

- organisations of their own so they can negotiate with government, traders, and NGOs;
- direct assistance through community-driven programmes so they can shape their own destinies; and
- local ownership of funds, so they can end corruption. They want NGOs and governments to be accountable to them.

The World Bank channels approximately USD 2 billion in annual lending using the community-driven development approach, which empowers local communities to take ownership of their development process (World Bank, 2007). Initiated by the International Development Association (IDA) at the World Bank, CDD projects have been instrumental in harnessing the energy and capacity of communities for poverty reduction. Since the start of this decade, IDA lending for CDD has averaged just over 50 operations annually, at an average total of USD 1.3 billion per year (World Bank, 2010). According to Elekwa and Innocent (2013), community-driven development is a development initiative that provides control of the development process, resources and decision-making authority directly to community groups. The underlying assumption of CDD projects is that communities are the best judges of how their lives and livelihoods can be improved and, if provided with adequate resources and information, they can organise themselves to provide for their immediate needs (Elekwa & Innocent, 2013). Renewable energy companies contribute to SED and ED funding for beneficiary communities during the life-span of a project which is commensurate with the current procurement programme affecting local community development investments for the next 20-years (Wlokas, 2015). It is, therefore, important to begin a process to transfer revenue management from the RE companies to the beneficiary communities very early in the revenue management process (Wlokas, 2015). Accordingly, it is worth investigating CDD as a long-term solution to managing revenue for beneficiary communities in the RE sector in RSA.

By treating poor people as assets and partners in the development process, previous studies have shown that CDD is responsive to local demands, inclusive, and more cost-effective compared to centralised NGO-based programmes (Elekwa & Innocent, 2013). CDD can also be supported by strengthening and financing community groups, facilitating community access to information, and promoting an enabling environment through policy and institutional reform (Dongier, Van Domelen, Ostrom, Ryan, Wakeman, Bebbington, Alkire, Esmail, 2003). CDD projects work by providing poor communities with direct funding for development and supporting the communities in deciding how to spend the money (Elekwa & Innocent, 2013). The community plans and builds the project and takes responsibility for monitoring its progress (Elekwa & Innocent, 2013).

3.10.1 Community Driven Transformation (CDT)

The beneficiary community must take a deliberate and willing stance to change irrespective of the differences that seemingly divide them, such as the interests of women, indigenous groups, ethnic minorities, the disabled, and people with AIDS, through community-based organisations (Dongier *et al.,* 2002). Given the diverse composition of beneficiary communities and the inherent legacies of apartheid, it is challenging to rally community members around a single purpose. Social division across lines of culture, ethnicity, gender, language and social standing have left many of the rural beneficiary communities fragmented and distrustful. In some contexts, communities are characterised by highly polarised, local, social and power structures along class, ethnic, or religious lines. In such contexts, it can be appropriate to rely on private support organisations to facilitate the formation and capacity building of new inclusive CBOs (Dongier *et al.*, 2002). In such contexts, working directly with CBOs, without intermediaries, might exacerbate tensions, inequalities, and social exclusion. Substantially reducing or eliminating these social barriers must be a pre-requisite for CDD (Dongier *et al.*, 2002). Research conducted by Casey, Glennerster and Miguel (2014) demonstrated that a well-implemented community-driven development programme in Sierra Leone was successful at setting up new village structures and improving the stock of local public goods. However, this did not lead to any lasting changes in village institutions, local capacity for collective action, social norms and attitudes, or the nature of *de facto* political power (Casey *et al.*, 2014). The research study further elucidates with certainty that far more research will be needed to identify the precise reforms and external interventions that can reshape institutions successfully to enhance capacity for collective action while promoting accountability and inclusion (Casey *et al.*, 2014). However, the notion of transforming and building cohesion within poor and vulnerable South African communities is not novel (Minyuku-Gobodo, 2008). Initially introduced in the ideals of the Freedom Charter, the idea finds expression in the post-apartheid 1994 South African Constitution, Bill of Rights and the multi-sector Reconstruction and Development Programme (Minyuku-Gobodo, 2008). In April 2007, the Western Cape Provincial Government initiated the Social Transformation Programme (STP-21), to focus government action and public-private partnership on community-building in 21 priority areas (Minyuku-Gobodo, 2008). Key outcomes of the STP-21 are building social cohesion, facilitating sustainable livelihoods, facilitating competitive places and enhancing the developmental state (Minyuku-Gobodo, 2008). STP-21 is applied in 21 priority areas identified on the basis of the communities' level of social capital and scope for community-driven transformation and development (Minyuku-Gobodo, 2008). The STP-21 programme included the following goals and mechanisms (Minyuku-Gobodo, 2008):

Table 3.2: The STP-21 programme

Goals	Mechanisms
Grow and share the economy	• Community Forums • Service Delivery Jamborees • Local Area Development Plans • Social Partnerships • Departmental Deliverables
More equal and caring society	
Ecological and sustainable development	
Greater spatial integration	

Source: Gobodo (2008)

The establishment of community forums requires active enhancement of the capacity of communities as key development partners (Minyuku-Gobodo, 2008). Capacitated communities can drive their own developmental outcomes, mobilise, advocate and lobby with social partner structures for resource allocation and decision-making for their collective benefit (Minyuku-Gobodo, 2008).

3.10.2 Community Driven Collaboration (CDC)

Jamal and Getz (1995), in their research into community tourism planning, developed a working definition of collaboration based on an examination of literature about collaboration theory and Gray's (1989) definition. The researchers posit that collaboration for community-based tourism planning is a process of joint decision making among autonomous, key stakeholders of an inter-organisational, community tourism domain to resolve planning problems of the domain and/or to manage issues related to the planning and development of the domain (Jamal & Getz, 1995). The term “community”, which these researchers describe as a "body of people living in the same locality”, is synonymous with the term “beneficiary community”.

From a practical point of view Gray (1989), analyses collaboration as a process of joint decision making among key stakeholders about the future of a problem domain (Dewulf, 2007). Five features are critical to this process (Dewulf, 2007):

- Mutual interdependence regarding the problem domain is a basic feature of collaboration processes. Interdependence brings stakeholders together and is the basis for elaborating mutually beneficial solutions;
- Solutions emerge by dealing constructively with differences. Differences are often avoided because of the potential for conflict. However, exchanges between the different stakeholders would be impossible if not for their different interests, resources, knowledge and skills. Differences can be either opposing or complementary, and one of the major issues in collaboration processes is to construct a complementarity of differences, which is more easily achieved at the level of underlying concerns or interest than at the level of predetermined positions or solutions;
- Collaboration involves joint ownership of decisions, meaning that participants are directly responsible for reaching agreement. Unlike litigation or regulation, where intermediaries devise solutions that are imposed on the stakeholders, in collaborative agreements the involved stakeholders impose decisions upon themselves;
- Stakeholders assume collective responsibility for the future direction of the problem domain. Through a form of self-regulation, a set of agreements governing future interactions among the stakeholders is established, restructuring the socially accepted rules for dealing with problems of this type. Collaboration might lead to increased co-ordination among the stakeholders, although that is not a necessary outcome of the process;
- Collaboration is an emergent process, subject to continuous change and development, typically evolving from under-organised systems in which stakeholder’s act independently, to more tightly organised relationships characterised by concerted decision making. In this sense, collaboration should be distinguished both from co-operation as a more informal way of

working together, and from co-ordination as a formal institutionalised relationship.

However, large programmes of support for CDD will not be sustainable without the policies, laws, systems, and governance processes that encourage effective collaboration among local governments, central governments, civil society, service providers, and CBOs (Dongier *et al.*, 2002). Eisinger and Senturia (2001: 531) quote a community board member, in their research paper, describing collaboration as learning how “to separate individual or personal agendas from...the collective agenda...to accomplish some greater good from the work that you’re doing”. The quoted board member aptly describes one of the key pre-requites for effective inter-community collaboration or community-driven collaboration. The research of Eisinger and Senturia (2001) produced the following set of Collaboration Principles that can be adapted for CDC in RSA.

- Preparation: Community involved in plans and development from the beginning.
- Inclusion: Community partners have real influence on all community development and activities.
- Participation: Community involved with specific projects in selection, implementation, shared ownership, maintenance and operations.
- Contribution: The values, perspectives, contributions, and confidentiality, where requested, of everyone in the community are respected.
- Beneficiation: Projects must have a long-term direct benefit for the beneficiary community.

Researchers Tait, Wlokas and Garside (2013a), commenting on SED in South Africa, suggest that the design and implementation of development initiatives concerning the same beneficiaries requires careful planning and collaboration between all stakeholders.

3.10.3 Community-Driven Innovation (CDI)

Mulgan, Tucker, Ali and Sanders (2008) define innovation as “new ideas that work”. This differentiates innovation from improvement which implies only incremental change, and from creativity and invention which are vital to innovation but miss out the hard work of implementation and diffusion that makes promising ideas useful (Mulgan *et al.*, 2008). Social innovation refers to new ideas that work in meeting social goals and, therefore, innovative activities and services that are motivated by the goal of meeting a social need and that are predominantly developed and diffused through organisations whose primary purposes are social (Mulgan *et al.*, 2008). Innovation becomes an imperative when problems are getting worse, when systems are not working or when institutions reflect past rather than present problems (Mulgan *et al.*, 2008). The other driver of innovation is awareness of a gap between what there is and what there ought to be, between what people need and what they are offered by governments, private firms and NGOs – a gap which is constantly widened by the emergence of new technologies and new scientific knowledge (Mulgan *et al.*, 2008).

O’Sullivan and Dooley (2008) define innovation as the application of practical tools and techniques that make changes, large and small, to products, processes, and services, which result in the introduction of something new for the organisation that adds value to customers and contributes to the knowledge store of the organisation. Wlokas agrees that the REIPPPP tender process is challenging and necessitates technical, legal and financial innovation (Wlokas, 2015). The South African National Energy Development Institute (SANEDI) is tasked with developing human capital in the energy research sector and also with funding fundamental and applied research to create and maintain a culture of innovation in the energy sector. The specific renewable energy arm of SANEDI is the Renewable Energy Centre of Research and Development (RECORD), (Maphelele *et al.*, 2013).

Social change is neither purely top-down nor bottom-up but it involves alliances between the top and the bottom (Murray, Caulier-Grice & Mulgan, 2010). Murray, Caulier-Grice and Mulgan (2010) identify six stages of social innovation that would be applicable to community-driven innovation as follows:

- Prompts, inspirations and diagnoses: This stage includes all the factors which highlight the need for innovation such as crisis, public spending cuts, poor performance, and strategy, as well as the inspirations which spark it from creative imagination to new evidence. This stage involves diagnosing the problem and framing the question in such a way that the root causes of the problem, not just its symptoms, will be tackled. Framing the right question is halfway to finding the right solution. This means going beyond symptoms to identifying the causes of a particular problem (Murray *et al.*, 2010);
- Prototyping and pilots: This is where ideas are tested in practice. This can be done through simply trying things out, or through more formal pilots, prototypes and randomised controlled trials. The process of refining and testing ideas is particularly important in the social economy because it is through iteration, and trial and error, that coalitions gather strength, for example, linking users to professionals, and conflicts are resolved, including battles with entrenched interests. It is also through these processes that measures of success come to be agreed upon (Murray *et al.*, 2010);
- Sustaining. This is when the idea becomes everyday practice. It involves sharpening ideas and often streamlining them, and identifying income streams to ensure the long-term financial sustainability of the firm, social enterprise or charity, that will carry the innovation forward. In the public sector, this means identifying budgets, teams and other resources such as legislation (Murray *et al.*, 2010);
- Scaling and diffusion. At this stage, there are a range of strategies for growing and spreading an innovation, from organisational growth, through licensing and franchising to federations and looser diffusion. Emulation and inspiration also play a critical role in spreading an idea or practice. Demand matters as much as supply, for example, how market demand, or demand from commissioners and policymakers is mobilised to spread a successful new model. This process is often referred to as “scaling” and, in some cases, the word is appropriate as the innovation is generalised within an organisation or the organisation itself expands. But scaling is a concept from the mass production age, and innovations take hold in the social economy in many other ways, whether through inspiration and emulation, or through the

provision of support and know-how from one to another in a more organic and adaptive kind of growth (Murray *et al.*, 2010);

- Systemic change. This is the ultimate goal of social innovation. Systemic change usually involves the interaction of many elements: social movements, business models, laws and regulations, data and infrastructure, and entirely new ways of thinking and acting. Systemic change generally involves new frameworks or architectures made up of many smaller innovations. Social innovations commonly come up against the barriers and hostility of an old order. Pioneers may sidestep these barriers, but the extent to which they can grow will often depend on the creation of new conditions to make the innovations economically viable. These conditions include new technologies, supply chains, institutional forms, skills, and regulatory and fiscal frameworks. Systemic innovation commonly involves changes in the public sector, private sector, grant economy and household sector, usually over long periods of time (Murray *et al.*, 2010).

3.11 Summary

In this part of the literature review, various revenue management systems were considered, especially international approaches to managing revenue for beneficiary communities and how they can be applied to the RE sector in RSA. The key principles of revenue management were examined in order to develop a model that is applicable specifically to renewable energy companies in RSA that are obligated to contribute and manage a percentage of revenue to be spent on SED and ED in beneficiary communities.

It was found that revenue management as such is primarily concerned with products and services where profitability is the key driver. In the current research study, revenue management refers to managing revenues on behalf of beneficiary communities and is closely linked to Corporate Social Responsibility (CSR)
The Global Reporting Initiative provides the standard framework for CSR reporting used around the world. The ten principles of the UNGC discussed in the chapter,

therefore, would also be applicable in the context of the RE sector regarding corporate social responsibility in RSA, and would provide a basis for any kind of revenue management for beneficiary communities. The idea that business is part of society and, therefore, has community and national responsibilities is established in the culture, as well as the economic history, of many African countries. This, combined with the influence of multinationals and international institutions such as the UN Global Compact, means that CSR is being carried out by both local businesses and foreign investors, and is encouraged by many governments

In South Africa, the JSE Securities Exchange prescribes compliance with the King III Report to their listed companies and CSR is embodied in the Broad-Based Black Economic Empowerment (B-BBEE) Act of 2003.

The revenue management models considered include the Sigma Model, The UNGC Performance Model, the Guangcai Model, and the Holcim Stakeholder Engagement Model.

Elements of the Global Compact Model were considered in the formulation of a revenue management model for the RE sector and might be particularly useful for companies that are not sure where to start in embarking on the continuous improvement process that is a key expectation of engagement in the Global Compact.

The Guangcai Programme provides a realistic model that demonstrates the potential of corporate social responsibility based on public-private partnerships. The model is particularly attractive to the RSA RE context since public-private partnerships have been in operation in the country for a number of years.

The Holcim Group Model has shown that on-going, direct engagement with stakeholders is essential to ensure their active involvement, for example, during the lifecycle of a community project. However, companies lack the capacity and incentive to engage appropriately with issues of development planning. It is, therefore, important to begin a process to transfer revenue management from the RE companies to the beneficiary communities very early in the revenue management process. Community-driven development (CDD) recognises that poor people are prime actors in the development process, not targets of externally designed, poverty reduction efforts. Accordingly, CDD was investigated as a long-term solution to managing revenue for beneficiary communities in the RE sector in RSA.

Chapter 4 discusses the formulation of the theoretical model and the selected variables that were hypothesised to influence the management of revenue for beneficiary communities in the renewable energy sector in RSA.

Chapter 4
Formulation of the Proposed Theoretical Model for Managing Revenue for Beneficiary Communities of Renewable Energy Companies in RSA

4.1 Introduction

A theory refers to a reasoned explanation of known facts that serves as a basis of investigation by which to seek the truth. A useful theory is heuristic, generates hypotheses that can be empirically verified, is useful in predicting behaviour, and is represented in a model (Burnight & Mosqueda, 2005). Hoyle (1995) first defined a model as a statistical statement about the relations among variables. Structural Equation Modelling (SEM) takes a confirmatory (hypothesis testing) approach to the multivariate analysis of structural theory that stipulates causal relations among multiple variables (Lei & Wu, 2007). The causal pattern of inter-variable relations within the theory is specified (Lei and Wu, 2007). The goal is to determine whether a hypothesised, theoretical model is consistent with the data collected to substantiate the theory (2007). The consistency is evaluated through model-data fit, which indicates the extent to which the possible network of relations among variables is plausible (2007).

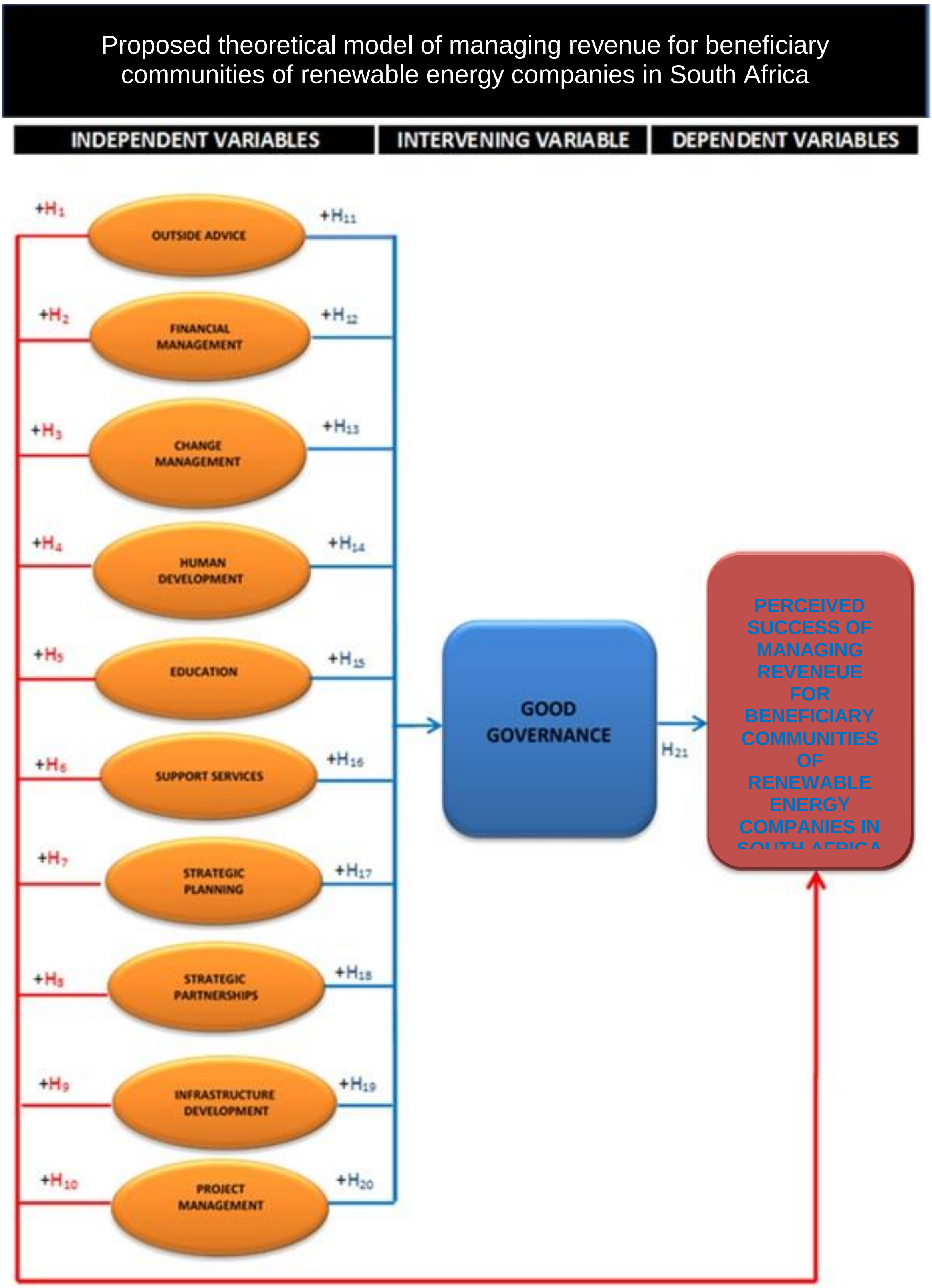
Having reviewed available literature about managing revenue for beneficiary communities, it became evident that not much progress has been made to ensure that sustainable and transformational changes take place in the beneficiary communities. Examples in the mining sector, where revenue has been managed for beneficiary communities, demonstrate a notable failure to develop the communities. A new approach to managing revenue for beneficiary communities is sorely needed. Revenue management for beneficiary communities in the renewable energy sector is further complicated by the unique requirements of the DoE regarding the area of benefit and the quarterly spend of SED and ED funds. The 50km boundaries can result in confusion and conflict because they could divide communities, villages and towns into beneficiaries and non-beneficiaries (Wlokas, Boyd & Andolfi, 2012).

This chapter includes a discussion of the theoretical model of selected variables, which are hypothesised to influence the effective management of revenue for beneficiary communities within the renewable energy sector in RSA. The independent, intervening and dependent variables thought to be present in the model are discussed together with their hypothesised relationships.
Models are commonly conceptualised and communicated in graphical forms in which a directional arrow (→) is universally used to indicate a hypothesised causal direction (Lei & Wu, 2007). In academic literature and research, variables to which arrows are pointing are commonly termed endogenous or dependent variables. The variables having no arrows pointing to them are called exogenous or independent variables. Unexplained co-variance among variables is indicated by a curved arrow. Observed variables are commonly enclosed in rectangular boxes and latent constructs are enclosed in circular or elliptical shapes (Lei & Wu, 2007).

4.2 The Theoretical Model

In the model of the investigation into the relationship between revenue management and the beneficiary communities, the dependent variable is the perceived success of managing revenue for beneficiary communities of renewable energy companies in RSA. The independent variables include: importance of change management, need for support services, requirements for strategic partnerships, benefits of education, importance of infrastructure development, importance of strategic financial management, need for strategic planning, benefits of project management, value of outside advice, need for human development and the importance of good governance. The hypothesised inter-relationships are shown in Figure 4.1.

Figure 4.1: The theoretical model



Source: Researcher's construct

Revenue management (RM) refers to the collection of strategies and tactics which firms use to manage demand for their products and services scientifically (Van Bruwaene, 2006). Revenue management (RM) is concerned with the methodology and systems required to make demand management decisions (Talluri *et al.*, 2008). Initially developed by the airline industry after the deregulation process in the 1970s, revenue management has expanded to its current form as a common business practice in a wide range of industries (Ivanov, 2014). Moreover, the importance of revenue management as a research field has been recognised by the launch of two academic journals dedicated to the theory and practice of revenue management: *Journal of Revenue and Pricing Management,* published since 2002 by Palgrave MacMillan, and the *International Journal of Revenue Management*, published since 2007 by Inderscience Publishers (Ivanov, 2014). While there are general revenue management principles that are easily applied across different industries, each industry also has specific characteristics that determine the practical aspects of revenue management within that field (Ivanov, 2014). Within the renewable energy sector in RSA, the amount of revenue, and how to distribute and manage it also raises challenges (Wlokas *et al.*, 2012). For example, the priorities identified in one of the renewable energy areas were: food security, youth development, cultural activities, business and work, faith, health services, education and training, leadership development, community facilities and infrastructure, and social services (Wlokas *et al.*, 2012). Translating these priorities into interventions depends on a range of variables such as the amount of revenue, capacity to implement and manage projects as well as the type of legal entity that manages any revenue stream (Wlokas *et al.*, 2012).

One of the most important aspects of providing successful SED and ED projects in beneficiary communities is the issue of revenue management. To execute sustainable and transformational community projects successfully requires a good revenue system. The strategic importance of the renewable energy sector in RSA and its responsibility to meet the economic development obligations as set out by the DoE is crucial to the South African economy and especially the development of rural and impoverished communities.

4.3 The Hypotheses and Description of Each Variable

To address the objectives set out in Section 1.3, the following research hypotheses were tested:

H1: There is a positive relationship between the use of specialist outside advice and the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa.

H2: There is a positive relationship between the implementation of strategic financial management measures and the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa.

H3: There is a positive relationship between incorporating change management processes and the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa.

H4: There is a positive relationship between the level of human development and the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa.

H5: There is a positive relationship between access to, and the level of, education and the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa.

H6: There is a positive relationship between the use of support services and the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa.

H7: There is a positive relationship between the extent of strategic planning and the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa.

H8: There is a positive relationship between the development of strategic partnerships and the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa.

H9: There is a positive relationship between infrastructure development projects and the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa.

H10: There is a positive relationship between project management methodologies and the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa.

H11: There is a positive relationship between the use of specialist outside advice and good governance and the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa.

H12: There is a positive relationship between the use of strategic financial management measures and good governance and the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa.

H13: There is a positive relationship between change management processes and good governance and the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa.

H14: There is a positive relationship between the level of human development and good governance and the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa.

H15: There is a positive relationship between access to, and level of, education and good governance and the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa.

H16: There is a positive relationship between the use of support services and good governance and the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa.

H17: There is a positive relationship between the extent of strategic planning and good governance and the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa.

H18: There is a positive relationship between the development of strategic partnerships and good governance and the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa.

H19: There is a positive relationship between infrastructure development projects and good governance the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa.

H20: There is a positive relationship between the extent of strategic planning and good governance and the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa.

H21: There is a positive relationship between good governance structures and the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa

4.3.1 Independent Variable 1: The Use of Specialist Outside Advice

The value of outside advice, particularly in the form of consultants and consulting service providers, is investigated in this sub-section. It is particularly important to understand the relationship between consultants and the RE Company as the client from the perspective of providing advice that is pertinent to ensuring successful management of revenue for beneficiary communities. It is helpful at this stage to distinguish between consultants and service providers and this is dealt with more specifically under the Independent Variable 6: Support Services. It is also important to understand the role of consultants and how to construct the scope of work to ensure that the advice received is put to the best use. Lastly, the criticisms of using consultants, who are often described as people who borrow the company's watch to tell the company what time it is (Ally, 1962). Are investigated this sub-section

Management consulting is an advisory service contracted for and provided to organisations by specially trained and qualified people who assist the client organisation, in an objective and independent manner, to identify management problems, analyse such problems, recommend solutions to these problems and help when requested in the implementation of solutions (Greiner & Metzger, 1983). There are important elements of Greiner and Metzger's (1983) definition that need to be noted because they determine the overall quality and value of the advice given by the consultant. Firstly, the person is required to be 'specially trained and qualified'. It is important that consultants to the RE sector are familiar with the RE industry in RSA and particularly the obligations that it has to the beneficiary communities. A significant advantage would be that the consultant has had experience in managing revenue for beneficiary communities within the RE sector. The issue of quarterly reporting mentioned earlier can present huge challenges for a consultant who is only familiar with general corporate social investment scenarios that are monitored and reported on annually.

Secondly, Greiner and Metzer's (1983) definition iterates that the consultant assists from an independent and objective perspective. The consultant does not take over the role of the RE company unless this is specifically requested in the contractual agreement. In this instance, the scope of work needs to be clearly defined since the onus is still on the RE company to meet its contractual obligations with the DoE. The last part of the definition is the crux of the matter in that the consultant is required to propose solutions that can be implemented to assist the RE company to manage revenues due to beneficiary communities successfully. Challenges in the RE sector have resulted in a number of consultancies starting up and claiming to offer solutions to managing revenue better for beneficiary communities, but very few have actually delivered notable successes. RE companies are realising the need to draw on outside advice and this has led to an increase in consultants. Blunsdon (2003) proposes that the management consulting industry exists because of the presence of persistent organisational and management problems that creates an atmosphere of uncertainty and exerts pressure on managers to be seen to be acting both rationally and innovatively. The RE industry in RSA calls for a high degree of innovation when it comes to beneficiary communities because the industry not customer to managing revenue under the unique obligations of the DoE.

The concept of viewing consultancy as a process was first proposed by Schein (1988, 1999), who refers to it as process consultation. Schein's (1999) model describes the consultant as an expert that tells clients what has to be done to solve their problems. Kakabadse (2006) expands on Schein's model by adding that the process consultation model is actually much more than making a diagnosis or solving a problem by way of expertise. Process consultation involves a series of different activities that help clients to perceive and to understand their problems in order to solve them by themselves (Kakabadse, 2006). It is crucially important that there is a deliberate transfer of skills because, as previously pointed out in the current study, there is a lack of information and expertise available to RE companies, beneficiary communities, and relevant stakeholders.

It is important to understand that the first aim of seeking outside advice and the first role of business consultants, Sturdy (1997) espouses, is to provide a re-assuring sense of control in order to reduce the uncertainty existing within the organisation.

4.3.1.1 Outside Advice and Planning

The management of revenue for beneficiary communities within the renewable energy sector must begin with a strategy for how the revenue will be spent in the short, medium and long term over the 20-year lifespan of the RE facility. This will include organisational design, change management, stakeholder engagement and project identification. The consultant would have to provide strategic advice on all of these aspects, including shareholders, lenders, community trust and the DoE, as well as high-level project identification (in line with documents such as the National Development Plan, the millennium goals, etc. The consultant will need to gather data through desktop research, surveys, interviews and various data analysis methods. The consultant must then present the client with recommendations that would ultimately lead to the drafting of a strategic plan for spending SED/ED revenue.

4.3.1.2 Outside Advice and Human Resources

Consultants can provide advice to the RE Companies concerning the design and deployment of staff including remuneration and benefits. Consultants can provide a range of services that may include support for the HR Department, HR processes and staff development. Within the RSA RE Sector, which is fairly new, the need for appropriately skilled human resources is critical, especially with regard to SED and ED activities. These include community liaison, project management, stakeholder management and a host of others that is new to RSA. Currently, RSA has a shortage of RE sector-specific jobs. The consultant should also be able to assist with the management of BEE requirements with regard to Employment Equity.

4.3.1.3 Outside advice and funding

As part of REIPPPP, IPPs are required to produce a financial model of the income and expenditure, including SED/ED and dividend spend over the 20-year lifespan of the RE Facility. The model should give an indication of the amount to be allocated to SED/ED and dividends and this will enable advisors to plan restructuring, project expenditure, expansion, etc. There might also be tax implications that need to be taken into account as well as tax exemption for Community Trust sand NPCs.

4.3.1.4 Outside Advice and Information Technology

The need to manage revenue for the beneficiary communities in the RE sector can be greatly enhanced by the introduction of appropriate information technology. The use of software for stakeholder management and project management would be of significant benefit to the RE company. Managing multiple SED/ED projects as well as reporting on quarterly spending to the DoE can be simplified significantly through the use of appropriate software.

Tracking stakeholders and recording engagements can have a huge effect on relations with communities, local government, other IPPs and shareholders. IT consultants can draw from a range of experience and innovative technology to assist with these processes.

4.3.1.5 Outside Advice and Community Baseline Studies

The use of baseline studies to get a better understanding of the beneficiary communities is crucial to managing revenue effectively for beneficiary communities in the RE sector in RSA. Consultants specialising in community asset mapping, needs analysis and analysing available desktop data such as the IDP and statistics can be extremely helpful in identifying potential projects. The community consultative process also indicates to the community that they are part of whatever socio-economic development will take place in their community. Therefore, the role of community development practitioners is critical to the process of gaining a deeper understanding of beneficiary communities.

The community development approach by the RSA Government has the following strengths and potential outputs (Hart, 2012). The approach:

- is focused on human development;
- is institutionalised at all levels of government;
- is linked to a full-time and paid employee, the community development practitioner, who facilitates and co-ordinates the process of community development;
- has the potential to decentralise decision making to the community;
- reinforces both the feeling of involvement and the possibility of dialogue;
- ensures an indigenous knowledge base of how to deal with social challenges; and
- promotes the values and principles enshrined in authoritative, international and national policy documents – namely the United Nations Declaration on Social Development, Human Rights conventions and declarations, the Millennium Development Goals and the Constitution of RSA.

It is therefore hypothesised that:

H1: There is a positive relationship between the use of specialist outside advice and the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa.

4.3.2 Independent Variable 2: The Implementation of Strategic Financial Management

Spending on SED and ED over the lifespan of the RE facility needs to be managed very carefully so that the RE company does not only meet its obligations but has a transformational and sustainable impact on the beneficiary communities. To ensure that transformational and sustainable projects are undertaken, the financial management of SED/ED funds for beneficiary communities must be strategic. Strategy involves perspective, position, plan, and pattern. Strategy is the bridge between policy or high-order goals on the one hand and tactics or concrete actions on the other (Nickols, 2016). Strategy and tactics together straddle the gap between ends and means (Nickols, 2016). In short, strategy is a term that refers to a complex web of thoughts, ideas, insights, experiences, goals, expertise, memories, perceptions, and expectations that provides general guidance for specific actions in pursuit of particular ends (Nickols, 2016). Nichol's definition can also be applied to managing revenue for beneficiary communities in the RE sector.

Strategic management plays a large part in strategic financial management. Strategic management is a set of managerial decisions and actions that determines the long-run performance of a corporation (Tang *et al.,* 2013). As the description emphasises, strategic management of an enterprise is concerned with attaining a sustainable positive performance and consists of four basic elements: environmental scanning, strategy formulation, strategy implementation, and evaluation and control (Tang *et al.*, 2013). All the elements referred to by Tang *et al.* (2013) form an integral part of strategic financial management for beneficiary communities. Financial management requires a reasonable knowledge of the socio-economic environment in the beneficiary communities.

It is therefore hypothesised that:

H2: There is a positive relationship between the implementation of strategic financial management measures and the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa.

4.3.3 Independent Variable 3: Incorporating Change Management Processes

As stated in Chapter 1, effective change management is required both for the RE company and for the beneficiary community. RE companies might have to review the organisational design of their organisations, increase capacity to include competent staff, train existing staff members or outsource some aspects of the SED and ED requirement to outside service providers. Change management, also known as change control, is a professional discipline, which focuses on supporting organisations on their way to a successful transition from a less-than-ideal *status quo* to a desired future state (Vedenik & Leber, 2015). RE companies usually find the need to transition to one form to another after the construction phase of the RE project, when the SED and ED obligations have to be implemented. Designing private sector renewable energy projects with a community benefit component is a new and innovative approach in RSA and, as with any new approach, there are inherent risks and challenges to overcome, relating to both the project developer and the community, particularly in the early stages of planning (Wlokas *et al.*, 2012). Vedenik and Leber (2015) quite rightly imply that change management approaches have two main objectives:

- to assist the organisation in achieving its goals which cannot be attained with the existing organisational structure, functioning, and client servicing, and
- to minimise the adverse effects of any changes made.

The challenge is that employees who have been recruited for the construction phase of the RE project might not be adequately skilled or even willing to change and might react negatively to the proposed changes. It is this reaction to change that warrants further research since the RE company is in a state of transition from contracting, where the emphasis is on engineering, human resources and logistics, to an emphasis on communities, the environment and socio-economic development. Wittig (2012) identifies three main factors that influence employee reactions to change that are of interest to RE companies: employees' emotions and cognitions, communication, and employees' participation in decision making. Ertuk warns that many change efforts fail because change agents underestimate the importance of the individual, cognitive-affective nature of change (Ertuk, 2008).

The result of ignoring or underestimating the cognitive-affective nature of change on the employee can lead to high levels of employee turnover. In organisations that rely on people to provide services, turnover threatens the agency`s reservoir of expertise, organisational effectiveness and sustainability (Howard, 2008). To reduce the risk for an organisation, change management must find a way to introduce or implement changes efficiently and manage them skilfully throughout all process phases (Vedenik & Leber, 2015). This process has to take place during the latter period of the construction phase of the RE project. The construction period for CSP is three years, which is a year longer than the construction period for a Wind Plant and two years longer than for Solar PV (Altgen Consulting, 2015). It is, therefore, recommended that change management is started a year before the estimated commercial operation date.

Vedenic and Leber's (2015) research defines fundamental cornerstones of a generic change management model that could be applicable to RE Companies as follows.
In order for a change to be successful, it is of key importance to transform the recognised need for change into a desire for change and define who will manage the change and build inter-relations in an organisation (Vedenic & Leber, 2015).

The generic process model is meant primarily for a specific group of users. Therefore, it has to be derived from an overview of the *status quo* and must identify the desired future state (Vedenik & Leber, 2015).

a) Every change strategy includes questions connected to people who go through the change process. The success or otherwise of the change depends on them.
b) A change manager must recognise the need or be aware of the needs of the people within, as well as outside, the organisation and identify whether they can sabotage the change or contribute to the change process. A motivated change team is needed for implementation.
c) The reasons for resisting the change must be identified, because the general commitment level can influence the change support level.
d) The purpose of the change initiative is to move the organisation to a state in which goals can be realised, or to a transition from the *status quo* to the desired state. The gap between these two states must be defined and filled.

e) In order for the goal to be attainable, it has to be supported by the most appropriate measurements of success or effect. If the goals of changes are clearly defined, the effects will be quite visible as well.
f) Change is a complex activity and it must be controlled by a wide-reaching, well-organised and flexible plan although, in reality, things might happen differently.
g) While the change project is progressing, the stage of implementing the change as a whole or in part, which is frequently the riskiest stage is reached.
h) Implementing the change within an organisation is a step in the change process that includes measures for change realisation.
i) Training and continual improvements must become an integral part of the change process.
j) When building the model, the development of lean thinking has to be considered or the various techniques and tools of lean operating systems must be studied.
k) Monitoring change enables progress to be monitored according to the plan and according to the goals achieved. This enables the adoption of measures that depend on individual situations.

Change management in the beneficiary community is also important to the success of managing revenue. As stated in Chapter 1, community shareholding and the concept of SED and ED revenues flowing regularly into the community over a twenty-year period is completely new and sometimes even foreign to the beneficiary communities. The teams that develop renewable energy projects are not community development experts (Wlokas *et al.*, 2012). Wlokas suggests that project developers must have a sufficient relationship with the community at an early stage in the application process in order to identify potential community benefit structures, beneficiaries, and potential socio-economic measures appropriate for the local context and admits that managing this is complex (Wlokas *et al.*, 2012). It is therefore essential that RE companies decide whether the process of community engagement and development will be outsourced to specialist service providers or whether in-house departments with skilled employees will be created to manage these processes. Either way, a basic understanding of communities is needed in order to avoid setting inappropriate SED and ED precedents that might be hard to repair or manage in the future.

Various efforts by governments and international donors have had minimal effect on poverty reduction in Sub-Saharan Africa (Bado, 2012). There is reason to believe that the traditional, top-down approach to development that has been the guiding principle behind poverty alleviation programmes in poor countries is not effective (Bado, 2012). Prevalent in the discourse since the independence of many African states, is the charge that mining has created enclave economies, benefiting neither the country nor communities near mines in terms of its potential contribution to sustainable development outcomes (Harvey, 2014). This has been true even of efforts by the mining industry in RSA over the past 40 years. On the other hand, community-driven development has not been particularly successful either. Some of the causes of project failure that have been cited include: lack of project management skills, limited access to and management of funds, lack of interpersonal skills, level of education in project members, lack of monitoring (Norman, 2012). The approach to SED and ED for beneficiary communities in RSA is more likely to succeed if it employs elements of both the top-down and community-driven approaches. However, the emphasis has to be on education and training for the beneficiary communities and assessing the needs, priorities and opportunities in those communities. Many studies and investigations point to a lack of skills and low level of education as a factor that has compromised the success of community projects (Norman, 2012). As indicated in the section on strategic financial management (Section 1.11.2 pg. 26), the approach to SED and ED must take into account the following elements: available funds, priority community needs, expected length of projects and the ability of existing organisations in the area to implement and manage the projects. The elements mentioned differ from beneficiary community to beneficiary community.

4.3.3.1 Baseline Studies as a Prelude to Change Management

There are a number of local service providers that offer a*sset mapping and needs analysis* (AMNA) services but very few are specialists in the field. It is therefore

essential that the RE company provides a clear scope of work for the service provider with updates and reporting sessions scheduled regularly. It is crucial that the assessment process includes both a desktop and field analysis of the area. Community engagement sessions should include the following stakeholders: local government, community-based organisation, community leaders such as religious leaders, school principals, tribal leaders, community forums, business forums and ordinary members of the community.
SMARTE gives the following reasons why community involvement is important (SMARTE, 2010:5):

- Identify overlooked local knowledge: Community members might have useful information about the site's history, past land uses and associated contaminants;
- Streamline efforts: Community members might have special issues or concerns that, if incorporated into a project at the outset, might help to reduce the likelihood of challenges to risk assessment results, and potential remediation or revitalisation plans;
- Gain acceptance: Community members who contribute to the revitalisation planning process will understand the process better and will be more likely to support a project in they have input, thus creating a sustainable project.

SMARTE (2010: 2) also listed the following as aims and advantages of community assessments (SMARTE, 2010):

- Define the community by gaining useful information on its current economic status, crime and census reports, educational systems, and existing stigmas;
- Identify stakeholders and local governmental leaders;
- Establish realistic expectations for the community input;
- Identify community goals and aspects for the future of the community;
- Educate residents about the process of project development;
- Identify specific aspects of the project that can accommodate some of the community goals;
- Identify infrastructure and transportation issues;

- Identify community needs (e.g., open space, affordable housing, etc.);
- Start the communication process by fostering a dialogue, seeking community interest and support, and sharing information, remediation, and redevelopment issues;
- Determine if the re-use or demolition of the site will benefit the community;
- Develop revitalisation plans that involve the community, make community improvements and respect the community's culture;
- Establish a local commitment to the project, ensuring maintenance, local involvement, and long-term improvements;
- Contribute to a sustainable end product.

It is therefore hypothesised that:

H3: There is a positive relationship between incorporating change management processes and the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa.

4.3.4 Independent Variable 4: The Level of Human Development

Although there are clear connections between monetary wealth and greater freedom, such as being able to live reasonably long lives, other factors have to be borne in mind, such as access to health services, social security, schooling and education or increasing social cohesion (Ortega *et al.,* 2010). Sen (2009: 253) contends that the well-being of people should shift its focus from "the means of living", such as income, to the "actual opportunities" a person has, which Sen (2009: 253) refers to as functionings and capabilities. ”Functionings” refer to the various things a person succeeds in ”doing or being”, such as participating in the life of a society, being healthy and so forth, while]”capabilities” refer to a person's real or substantive freedom to achieve such functionings, for example, the ability to take part in the life of a society (Hick, 2012). The 1990 United Nations Development Report defines human development in the following manner (UNDP, 1990).

> Human development is a process of enlarging people's choices. In principle, these choices can be infinite and change over time. But, at all levels of development, the three essential ones are for people to lead a long and healthy life, to acquire knowledge and to have access to resources needed for a decent standard of living. If these essential choices are not available, many other opportunities remain inaccessible.

The DoE defines the purpose of SED as being to make financial contributions to socio-economic development initiatives that promote access to the economy for black people (DoE, 2011). Therefore, human development is the essence of the South African Government’s plan for SED in the spirit of the UNDP 1990 report. However, this begs the question of how RE companies integrate human development into managing revenue for beneficiary communities. The researcher proposes three possible ways in which RE companies can ensure that human development becomes an integral part of managing revenue for beneficiary communities. Using the UNDP 1990 report, the first objective is to improve the quality of life and life expectancy of community members in beneficiary communities. Even though human development is essentially the responsibility of government, it does create an opportunity for partnerships with local government in the area of obligations to beneficiary communities. With the construction of RE facilities, there has been a great influx of people into the nearby areas because of the perception that jobs would become available. This has placed severe stress on already stressed local service delivery. The lack of infrastructure such as clinics, water and sewage, schools, housing and roads has had a severe impact on the quality of life of community members. The need for Public Private Partnerships (PPPs) has become even more urgent to address some of these issues. It has been stated that SED efforts should be directed towards health, education, service delivery, arts and sports programmes (Wlokas, 2015).

The primary aim of using revenue for the purpose of enhancing human development in beneficiary communities is that it should always contribute to the formation of human capabilities, such as improved health, knowledge and skills, and the use people make of their acquired capabilities for leisure, productive purposes or being active in cultural, social and political affairs (UNDP, 1990).

Another crucial aspect of which to be aware is that corruption is the enemy of human development. In 1997 the World Bank defined corruption as" abuse of public office for private gain" (UNDP, 1990). When funds that are intended for public health or education are lost to corruption, this might have negative effects on life expectancy and schooling (Marsh, 2014).

According to the World Bank Report (1997), it is suggested that the increased flexibility of civil servants will merely increase arbitrariness and corruption, but not improve service delivery, and that drafting and enforcing complex public–private contracts requires specialised, scarce skills. Thus the need to strengthen rule-based compliance first (Wenzel, 2007).

It is therefore hypothesised that:

H4: There is a positive relationship between the level of human development and the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa.

4.3.5 Independent variable 5: Access to and the Level of Education

As already alluded to in Chapter 1, education is one of the key variables that affects the perceived success of managing revenue for beneficiary communities in RSA. Sandoval deduces that cognitive skills gained in primary and secondary education historically bring about more economic returns (Sandoval, 2012). By increasing the amount of schooling, students have more time to develop basic skills in disciplines such as reading, mathematics, and science (Sandoval, 2012). It is noted that there are a number of causal factors affecting access and levels of education in rural communities, which form the majority of beneficiary communities in the RE areas of obligation. It is common knowledge that school education remains the responsibility of government. However, according to Gardiner (2008), there is a crisis in the whole South African education system, and this crisis is most serious among learners in rural schools (Gardiner, 2008). In order to determine the kinds of interventions that would assist RE companies to have a positive impact on the state of education within the areas of obligation, it is important to understand the different levels of education and the effect that interventions will have in the long term. Early indications are that a number of RE companies have already allocated SED funding towards education, such as bursaries for tertiary education. However, for education to be effective in the immediate, medium and long term, there has to be a holistic and systemic view of education in the beneficiary communities and how SED funding can be strategically used to influence the area positively. Any intervention in the education sphere would invariably involve government on local, district and provincial levels in order to incorporate other possible funders, as well as to align with government's education plans for the area. The aim is to complement government's efforts in the area without antagonizing local officials or taking over the responsibilities of the local government departments.

The chosen intervention should be holistic and therefore must consider the well-being of the individual, the needs of the education centre and the impact that the intervention will have on the beneficiary community.

Other education interventions include:

- Adult basic education and training (ABET): Adult basic education and training remains a top priority for the RSA Government (Williams & Mann, 2011). If there are existing ABET centres operating in the beneficiary communities, they might just require upgrading in terms of capacity and resources. It is advisable to engage with the relevant government department should the RE company consider establishing an ABET centre.
- Students who have matriculated and qualify for further education or training at a recognised training institution: In the case of students who are eligible to study at a recognised higher education institution, it is important to provide funding that will cover the entire studying process such as transport costs,

accommodation, food, tuition fees, stationary as well as a basic allowance. In these instances, students should be closely monitored to ensure that they are successful in their studies.

- Further education and training (FET): This is especially appropriate for students who have not completed their high school education but qualify to study at one of the FET colleges. The same scholarship funding described in the previous point should be adopted.
- Driving schools: The minimum education intervention that should be considered for SED funds is driving lessons, especially for individuals who do not qualify for the above categories of education and training.

Adendorff notes that education is a significant driver of a country's economic potential and performance (Adendorff & Collier, 2015). Adendorff and Collier say that passible primary education, and the accessibility of secondary and higher education are even more significant for ascertaining whether societies are likely to graduate up the value-added production ladders (Adendorff & Collier, 2015). The comments made by Adendorff and Collier once again confirm the benefits of education as an independent variable affecting the success of managing revenue for beneficiary communities of RE companies in RSA.

It is therefore hypothesised that:

H5: There is a positive relationship between access to and the level of education and the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa.

4.3.6 Independent Variable 6: The Use of Support Services

As defined in Chapter 1, support services refers specifically to companies that provide services to RE companies which they are not able to provide themselves. Support services are used because the RE company has neither the capacity nor the expertise required to implement a particular aspect of managing revenue successfully for beneficiary communities. The online business dictionary defines support services as an activity or function required for successful completion of a process, programme, or project (Business Dictionary, 2015). In the RE sector there are a number of business support services that are not related directly to the core business of RE production but which are an integral part of managing revenue for beneficiary communities. The RE company can either outsource some or all of these services to outside service providers or train and/or employ staff to carry out some of these functions. The RE company might choose to focus on operations and maintenance of the RE facility only and outsource all the SED and ED activities as well as the reporting to the DoE. The risk of outsourcing all the SED and ED services is that there might not be a clear strategy for real transformation in the beneficiary communities over the lifespan of the RE company, but merely to meet the obligations of the DoE as set out in the IA. The government of RSA sees renewables as having a critical role in advancing transformation of the energy sector and social equity (DOE, 2015).

4.3.6.1 Support Services for Education and Training

Education and training services are needed at all levels of revenue for beneficiary communities being managed by RE Companies including training for in-house staff dealing with SED/ED activities as well as education and training for the beneficiary communities themselves, including local government, community trusts, and community-based organisations, entrepreneurs and community leaders.

4.3.6.2 Support Services for Environmental Impact Assessment

Asset mapping is a tool that can be used for developing a community “from the inside out” by means of identifying and mobilising community assets (Kretzmann & McKnight, 1993: 21). Rather than focusing on the “‘problems” to “fix” within communities and addressing such challenges entirely with external skills and funding, asset mapping identifies individuals, groups and institutions within a community that might play key roles in growing a community’s social and economic well-being (Du Plessis *et al.,* 2012). These community agencies are then incorporated into partnerships with development agencies who seek to strengthen the influence of community assets, which might be local leaders, local businesses, lobby groups etc., and to assist in the sustainable development of such assets to increase the efficiency with which they achieve their goals (Du Plessis *et al.*, 2012). There are a number of local service providers (SPs) that provide asset-mapping services but it is important to ensure that they are provided with a clear scope of work of what is expected from them.

It would be advisable to form a partnership with other RE companies in the area so that the communities are not unduly burdened by several surveys being done on the same community. This often leads to community fatigue, which is described as a process that typically occurs during projects that require participation over time or with groups of people who are continually engaged in research in areas where research groups are limited or research is conducted in high volumes (Way, 2013). It is important to note that the asset mapping activity that takes place in the community might create an expectation that something positive is about to happen in the area. The experience of fatigue is particularly severe for people who engage with the expectation of results and are disappointed or even alienated by the process when no discernible change is experienced (Way, 2013).

4.3.6.3 Support Services for Business

Business support services might include a variety of services for both the RE company and the ED beneficiary. Financial support services for the RE company include services that do not form part of, or require specialised knowledge of, a particular aspect of managing revenue for beneficiary communities. These include, but are not limited to, financial support services, including trust administration services and IT services, as a result of a number of RE support services literally springing up overnight or being tagged onto the profiles of existing service providers who have neither the expertise nor the experience to provide the service. Reporting to the DoE has also become a daunting task for many RE companies and this function is often outsourced to specialised service providers who are not only able to meet the obligations but also track revenue management models over the long-term to ensure maximum and sustainable impact.

4.3.6.4 Support Services for SED/ED Management

A number of RE companies have outsourced their SED/ED management function completely to outside service providers because local community development is not part of the core business of renewable energy developers and, therefore, project companies find the programme’s requirements challenging (Wlokas, 2015). Companies are developing strategies and expertise to fulfil the requirements, but a lack of time and experience often prevents meaningful engagement (Wlokas, 2015). This results in the potential for unintended consequences associated with the investments in local economies (Wlokas, 2015). As mentioned before, it is important that the SP is completely familiar with the RE sector and the economic development obligations of the DoE. There are, however, a number of risks that might be associated with outsourcing the management of SED / ED revenue completely to an SP, which include the following:

- The RE company might become completely disconnected from the beneficiary communities;
- The SP might be completely unfamiliar with the beneficiary communities and their needs;
- The beneficiary communities might reject the SP and request that a local SP be used. This could lead to a number of unintended consequences;
- There might be delays in reporting if disputes arise out of using the SP. This could result in penalties (termination points), being incurred by the RE company.

4.3.6.5 Support Services for Legal Services

There is no doubt that legal services will be required for a number of purposes that are best left to specialists such as: contracts with suppliers, beneficiary recipients, service level agreements with third party service providers, public/private partnership agreements and the drafting of the community trust deed. Legal requirements might also include company policies and procedures with specific reference to managing revenue for beneficiary communities as well as a number of terms of reference for various committees and sub-committees. Companies are also obliged to appoint a social and ethics committee to ensure that various interests, including acceptable standards of conduct in managing revenue for beneficiary communities are adhered to. The drafting of a social and ethics charter is one of the legal requirements of this condition and is best outsourced to a legal service provider. The charter will also include the terms of reference that will govern the social and ethics committee.

4.3.6.6 Support Services for Human Resources

As with any other company RE companies rely heavily on human resources service providers to deal with matters such as recruitment, labour issues, staff development, etc. Many of the skills required for managing revenue successful for beneficiary communities are highly specialised and require very careful sourcing and appointing.

It is therefore hypothesised that:

H6: There is a positive relationship between the use of support services and the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa.

4.3.7 Independent Variable 7: The Need for Strategic Planning

As established earlier, strategic planning is the systematic process by which a company, organisation, or institution (or one of its units), formulates achievable policy objectives for future growth and development over a period of years, based on its mission and goals and on a realistic assessment of the human and material resources available to implement the plan (Joan, 2004; Kendall *et al.,* 2008).

McCann (2003) states that strategic planning is vitally important for two reasons. Firstly, the very process of committing a project to writing for review and comment by key stakeholders often creates a much greater sense of collaboration. This process increases the potential of people taking ownership of the project. Secondly, by reducing the vision to writing and obtaining feedback from key stakeholders, such as a board of advisors, the content of a plan is usually vastly improved. The product of a strategic planning effort is typically a document that elaborates a high-level strategy and articulates the elements that influence it; it is a full description of the organisational environment and intentions (Gates, 2010). Gates proposes a number of high-level elements that form part of a strategic plan that can be adapted for the management of revenue for beneficiary communities in the renewable energy sector (Gates, 2010) As follows:

- The What: These are descriptions of what the organisation does and what it aspires to achieve:

    - Meeting the DoE obligations in terms of the provisions of the IA;
    - Having an immediate and meaningful impact on the beneficiary communities;
    - Conducting parallel processes that will identify short-, medium- and long-term, sustainable and transformational projects;
    - Conducting on-going quantitative and qualitative performance measures in order to refine the “what”.

- The Present: This is a description of the present situation, or current environment including:

    - What is the current condition of the RE Company? Does the RE company’s mission include successful management of beneficiary communities.
    - What is the current condition of the beneficiary environment?
    - What are the weaknesses or challenges to successful revenue management for beneficiary communities?

- The Future: A description of the desired future according to the organisation's vision and targets:

    - What does the organisation ultimately want to achieve to ensure the successful management of revenue for beneficiary communities?
    - Is the desired future of the beneficiary community part of the vision of the RE company?

- The How: A description of the preferred route to achieve the organisation's goals:

    - What changes does the RE company need to undergo to ensure successful management of revenue for beneficiary communities?

Strategic planning is one of the ways that RE companies can ensure that the management of revenue over the 20-year life span of the RE facility has a meaningful, transformational and sustainable impact on the beneficiary communities.

It is therefore hypothesised that:

H7: There is a positive relationship between the need for strategic planning and the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa.

4.3.8 Independent Variable 8: Strategic Partnerships

Price Waterhouse Cooper (PWC, 2009) describes a strategic partnership as involving some type of formal agreement between two or more parties (a bilateral or network partnership), that have agreed to share finance, skills, information and/or other resources in the pursuit of common goals. The pursuit of a common goal must always be the main purpose of forming a strategic partnership when it comes to managing revenue for beneficiary communities in the renewable energy sector. As stated earlier, the strategic partnership concept rests on the notion that performance can be improved significantly through joint, mutually dependent action (Henderson, 1990). The mutual dependent aspect of the partnership would be defined in the context of the type of partnerships that are possible. As stated earlier in this study, the use of public/private partnerships is one of the factors that is essential to successful management of revenue for beneficiary communities. However, it must be noted that the type of PPP referred to in regard to managing revenue for beneficiary communities is slightly different from the traditional type of PPP because of its not-for-profit nature. As defined by the RSA National Treasury, “A PPP is not a donation by a private party for a public good” (PPP Unit, 2007). This means that the partnership has to make use of state property. A PPP is defined in South African Law as: a contract between a government institution and a private party (PPP Unit, 2007: 7) where:

- the private party performs an institutional function and/or uses state property in terms of output specifications;
- substantial project risk (financial, technical, operational), is transferred to the private party.

However, any move towards partnering with local government to boost service needs to be negotiated very clearly. Many municipalities are under severe budgetary constraints and the temptation to place the burden of service delivery on to the shoulders of the RE company could be very tempting. Handing over funds to municipalities might be equally risky. According to research by Wlokas (2015)., one RE company proposed to channel the SED funds to the local municipality for service delivery of infrastructure projects The purpose should remain to partner on local service delivery projects that will directly affect and improve on the quality of life of individual beneficiary community members and therefore add substantially to human development. PPPs should only be undertaken with the understanding that the RE company makes use of state-owned property with a view to the state (local government) assuming full ownership and on-going maintenance of the project once it is completed. The RE company might, in future, contribute towards on-going maintenance but it must remain the responsibility of the state. All financial benefits derived from the project thereafter accrue to the state.

In terms of partnerships with other funders including other RE companies that are responsible for managing revenue for the same beneficiary communities, it makes sense for RE companies in the same obligation area to agree to share finance, skills, information and/or other resources in the pursuit of common goals (PWC, 2009). However, there are a few considerations that need to be taken into account if partnerships between RE companies are to stand any chance of succeeding. There is no inherent financial risk in this type of partnership since the funding from the parties' forms part of their spending on SED/ED. The partnership, hover, does have an obligation risk to the DoE, and a reputational risk in the eyes of the beneficiary community and local government.

It is therefore hypothesised that:

H8: There is a positive relationship between strategic partnerships and the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa.

4.3.9 Independent Variable 9: The Importance of Infrastructure Development

As stated in Chapter 1, the importance of infrastructure development cannot be over-emphasised because the majority of beneficiary communities that fall within the RE sector have a desperate need for new and improved infrastructure. The use of asset mapping to identify infrastructure needs as well as analysing existing infrastructure has also been discussed. The key is to seek partnership with other stakeholders on infrastructure projects, such as local government and other RE companies. It is therefore important to engage with local government and be familiar with their Integrated Development Plan (IDP). The appropriate level of infrastructure development within a given area determines the success of all initiatives regarding economic activities and improves the life quality of the population living within it (Dolata, 2013). Dolata (2013) draws the following conclusions regarding infrastructure and sustainable rural development that might be of significance to infrastructure development for beneficiary communities in the RE sector:

- infrastructure takes one of the leading positions among other factors determining sustainable rural development in the economic, social, and environmental fields;
- development of infrastructure is an indispensable condition for economic recovery of rural areas, but it is not a sufficient condition for inducing significant and durable changes in that development; the effect infrastructure facilities on the level of rural development depends largely on the synchronisation of planning and development of infrastructure considering the conditions and utilization structure of the given area;
- a minimum level of infrastructure facilities is indispensable for ensuring rural development; nevertheless, beyond that level, a further increase of investment expenditures on some infrastructure elements can be economically unjustified and lead to a situation where it becomes a barrier rather than a stimulus for rural development processes;
- in recent studies on infrastructure as a factor of development (Dolata, 2013), the researchers withdraw from regarding it in terms of demand, i.e. as a factor stimulating demand and stabilizing the economic situation; the supply approach prevails, emphasising the significance of infrastructure for increasing the location attractiveness of the given region;

It is therefore important that interventions regarding the infrastructure in beneficiary communities are preceded by empirical evidence that the planned intervention will have significant and long-term benefits that are sustainable. The vision of the South African Government’s National Development Plan includes better integration of the country's rural areas achieved through successful land reform, infrastructure development, job creation and poverty alleviation (National Planning Commission, 2011). According to the literature reviewed about the importance of infrastructure development in rural communities, a number of focus areas have been identified which include water and sanitation, telecommunications, transport, electricity and physical infrastructure in health, education, sport and recreation. While it is noted that it remains the responsibility of government, infrastructure development provides a unique opportunity for PPPs as a means to have a significant impact on the quality of life of the beneficiary communities and their access to the economy. Although education remains a priority, it can only flourish in a healthy environment. Causalities such as access to clean water, nutrition, electricity, transport, telecommunication (access to the internet), affect the educative process. Improvement in related infrastructure can improve the educative process and drastically alter the quality of life of beneficiary communities.

It is therefore hypothesised that:

H9: There is a positive relationship between the importance of infrastructure development and the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa.

4.3.10 Independent Variable 10: The Benefits of Project Management

Project Management is the process of achieving project objectives (schedule, budget and performance), through a set of activities that start and end at certain points in time and produce quantifiable and qualified deliverables (City of Chandler, 2010). Successful project management is the art of bringing together the tasks, resources and people necessary to accomplish the business goals and objectives within the specified time constraints and within the monetary allowance. Projects and programmes are directly linked (City of Chandler, 2010). The Project Management Body of Knowledge (PMBOK) explains that there are nine major areas of knowledge required by project managers. This could also be applicable to successful management of revenue for beneficiary communities of RE companies in RSA (PMI, 2013). These key areas are:

- Project Integration Management
- Project Scope Management
- Project Time Management

- Project Cost Management
- Project Quality Management
- Project Human Resources Management
- Project Communications Management
- Project Risk Management
- Project Procurement Management

The various areas of management comprised processes, tools and techniques that form important elements of the management of the project. Project managers, or the organisation, can divide projects into phases to provide better management control with appropriate links to the on-going operations of the performing organisation, which is referred to as the project life cycle (PMI, 2013). A typical life cycle of SED/ED projects (adapted from PMBOK) would include:

- What technical work needs to be done in each phase of the project? For example: architectural drawings, technical diagrams, etc.?
- What is the due date for each deliverable and how will each deliverable be reviewed, verified and validated? For example: project negotiations, permissions, signoffs, implementation phases, inspections, etc.?
- Who will be responsible for each of the project phases and the level of expertise they bring to the project? This should also make provision for training of employees from the local communities.
- How will each project phase be controlled and approved and who is responsible for that approval?

It is important to review the stakeholder management aspects of project management because stakeholders will always, directly or indirectly, be part of the projects that benefit communities in the renewable energy sector. The beneficiary communities will always be the primary stakeholders. Failure to identify a key stakeholder can cause major problems for a project (PMI, 2013). Stakeholders might have a positive or negative influence on a project. Positive stakeholders are those who would normally benefit from a successful outcome from the project, while negative stakeholders are those who anticipate negative outcomes from the project's success (PMI, 2013). For example, business leaders from a community that will benefit from an industrial expansion project might be positive stakeholders because they anticipate economic benefit to the community from the project's success while environmental groups could be negative stakeholders if they view the project as doing harm to the environment (PMI, 2013). Key stakeholders on projects aimed at beneficiary communities in the RE sector would include:

- The RE company,
- The project manager and project team,
- The beneficiary community including CBOs and community leaders,
- Local authority (especially on large infrastructure projects and PPPs),
- Contractors and sub-contractors to the project,
- Other RE companies in partnerships or joint ventures.

4.3.10.1 Authority Matrix

It is important for project management to include an authority matrix because of the range in size and value of SED and ED projects. An authority matrix can be defined as a list or table that sets out areas of responsibility and who can approve a change, subject to cost limits (Project management.org, 2015). It is important that a clear indication is given as to what changes to the project can be approved by the project manager as well as the limit to which project manager can sign off on projects. Internal structures and people responsible for approving and signing-off projects are also indicated on the authority matrix. The project communications and reporting plan is the knowledge area that employs the processes required to ensure timely and appropriate generation, collection, distribution, storage, retrieval, and ultimate disposal of project information (PMI, 2013). The Project Management Institute highlights the following aspects of the Project Communications Management processes (PMI, 2013):

- Communications Planning: determining the information and communication needs of the project stakeholders;

- Information Distribution: making necessary information available to project stakeholders in a timely manner;
- Performance Reporting: collecting and distributing performance information, including status reporting, progress measurement, and forecasting;
- Managing Stakeholders: managing communications to satisfy the requirements of, and resolve issues with, project stakeholders.

Finally, risk management includes the processes concerned with the planning, identification, analysis, responses, monitoring and control of the risks of a project. most of these processes are updated throughout the project (PMI, 2013).

It is therefore hypothesised that:

H10: There is a positive relationship between the benefits of project management and the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa.

4.4 Intervening Variable 11: Good Governance

There are a number of best practices accepted both nationally and internationally that enable RE companies to form good governance structures to ensure successful management of revenue for beneficiary communities in the renewable energy sector. There are also a number of documents available nationally and internationally that enable RE companies to form good governance structures that can aid the success of managing revenue for beneficiary communities. The following is a list of documents that have been drafted to assist companies and are discussed in the sub-sections below:

- The new Companies Act of 2008, No. 71
- The King III Report that was released on 1 September 2009.
- Organisation for Economic Cooperation and Development (OECD): Principles of Good Governance 2015

- The Ten Principles of the UN Global Compact

4.4.1 The New Companies Act of 2008, No. 71

The Companies Act 71 of 2008, which came into effect on 1 May 2011, applies to all RSA companies. The New Companies Act constitutes a wholesale overhaul of company law in RSA and seeks to promote transparency and accountability in the RSA corporate sector (Walker & Mokoena, 2011). The New Companies Act heralds a major shift in RSA company law and it is intended to improve corporate governance in the (Walker & Mokoena, 2011). The New Companies Act, combined with the detailed principles and recommendations in King III Report, result in a situation in which corporate governance is extensively regulated in RSA (Walker & Mokoena, 2011). One of the significant provisions of the act is to "promote the development of the RSA's economy by encouraging transparency and high standards of corporate governance, as appropriate, given the significant role of enterprises within the social and economic life of the nation" (Stein, 2013:7). Another innovation occasioned by this new approach is the obligation of certain companies to have a social and ethics committee (Stein, 2013). The social and ethics committee (SEC), forms one of the key good governance structures that should be considered by RE companies when managing revenue for beneficiary communities. See Section 4.4.5 about SEC below.

4.4.2 The King III Report

The King III Report became necessary because of the anticipated New Companies Act and changing trends in international governance (PwC, 2009). As with King I and King II, the King Committee endeavoured to be at the forefront of governance internationally, and this has been achieved again by focusing on the importance of annual reporting on how a company has affected the economic life of the community in which it operated both positively and negatively during the year under review (PWC, 2009). The key principle of the King III Report regarding good governance is that good governance is essentially about effective leadership, and that leaders need to define strategy, provide direction and establish the ethics and values that will influence and guide practices and behaviour with regard to sustainable performance. However, it is noted in King III that the board of directors, in its collective decision making, can conclude that to follow a practice recommended in a code would not be in the best interests of the company in the particular circumstances pertaining at the time and might decide to apply another practice (PWC, 2009). The board must explain the practice it applies, if different from the recommended one, and the reasons for applying it (PWC, 2009). Nevertheless, King III is internationally recognised and RE companies should be encouraged to apply the recommendations as far as possible in managing revenue for beneficiary communities.

4.4.3 Organisation for Economic Co-operation and Development: Principles of Good Governance 2015

The following are the principles of good governance approved by the Organisation for Economic Co-operation and Development (OECD, 2015):

a) OECD Recommendation on Principles for Transparency and Integrity in Lobbying (2010). On 18 February 2010, the OECD Council approved the OECD Recommendation on Principles for Transparency and Integrity in Lobbying. This is the first international policy instrument to provide guidance for policy-makers on how to promote good governance principles in lobbying. The instrument is an important contribution to support cleaner, fairer and stronger economies as it promotes open government and a level playing field for businesses and stakeholders in developing and implementing public policies.

b) OECD Recommendation on Enhancing Integrity in Public Procurement (2008). Millions in taxpayers' money is lost annually to waste, fraud and corruption in public procurement. OECD countries demonstrated their commitment to prevent risks to integrity in the entire procurement cycle, from needs assessment to contract management and payment. The OECD Recommendation provides policy guidance for the implementation of international instruments developed by the OECD as well as other organisations such as the United Nations, the World Trade Organisation, the World Bank and the European Union.

c) OECD Recommendation on Guidelines for Managing Conflict of Interest in the Public Service (2003). Conflicts of interest in both the public and private sectors have become a matter of major public concern worldwide. These guidelines provide the first international framework of reference for reviewing existing solutions and modernising mechanisms in line with good practices in OECD countries.

d) OECD Recommendation on Improving Ethical Conduct in the Public Service including Principles for Managing Ethics in the Public Service (1998). Increased concern about corruption and the decline of confidence in government has prompted governments to review their approaches to ethical conduct. In response to these challenges. The Public Management Committee agreed to a set of Principles for Managing Ethics in the Public Service to help countries review the institutions, systems and mechanisms they have for promoting public service ethics. These principles identify the functions of guidance, management or control against which public ethics management systems can be checked. They draw on the experience of OECD countries, and reflect shared views of sound ethics management.

4.4.4 The Ten Principles of the UN Global Compact

The UN Global Compact asks companies to embrace, support and enact, within their sphere of influence, a set of core values in the areas of human rights, labour standards, the environment and anti-corruption. The ten principles of the UN Global Compact in the areas of human rights, labour, the environment and anti-corruption enjoy universal consensus and are derived from:

- The Universal Declaration of Human Rights;
- The International Labour Organisation's Declaration on Fundamental Principles and Rights at Work;

- The Rio Declaration on Environment and Development;
- The United Nations Convention against Corruption.

4.4.5 The Social and Ethics Committee as an Internal Good Governance Structure

The Companies Act now provides the Minister of Trade and Industry with the authority to require certain companies to have a Social and Ethics Committee, to monitor the impact such companies have on the public interest (Erasmus, 2014). In terms of Section 72 of the Companies Act (read with Companies Regulation 43), the following companies should have appointed a Social and Ethics Committee by 30 April 2012, one year after the act became effective (Erasmus,2014):

- Every state-owned company;
- Every listed public company; and
- Any other company that, in any two of the previous five years, has had a public interest score of at least 500 points.

Erasmus (2014) summarises the requirements of SEC as follows

The social and ethics committee must comprise no fewer than three members. These members may be directors or prescribed officers of the company. However, at least one must be a non-executive director who is not involved in the day-to-day management of the company's business and must not have been so involved during the previous three financial years.

In terms of Companies Regulation 43, a social and ethics committee has to monitor the company's activities with regard to matters relating to social and economic development, including the company's standing in terms of the goals and purposes of:

- The 10 principles set out in the United Nations Global Company Principles;

- The OECD recommendations regarding corruption;
- The Employment Equity Act, No 55 of 1998; The Broad-Based Black Economic Empowerment Act, No 53 of 2003;
- Good corporate citizenship, including the company's promotion of equality, prevention of unfair discrimination and measures to address corruption;
- Contribution to development of the communities in which its activities are predominantly conducted or within which its products or services are predominantly marketed; and
- Record of sponsorship, donations and charitable giving;
- The environment, health and public safety, including the impact of the company's activities and its products or services;
- Consumer relationships, including the company's policies and records relating to advertising, public relations and compliance with consumer protection laws; and
- Labour and employment matters.

In the light of the above, it is evident that the SEC is an important structure of good governance because it is directly responsible for the oversight of managing revenue for beneficiary communities although the ultimate responsibility rests with the board of directors of the RE company. The SEC may also choose to appoint a sub-committee, such as the project review committee (PRC) to carry out the appraisal of SED and ED projects. All of these committees and sub-committees are guided by terms of reference approved by the board. The SEC is guided by the SEC charter, which sets out the objectives, composition, authority, roles and responsibilities of committee members, meeting procedures, remuneration and overall function of the SEC.

Having sound and functioning good governance structures within an RE company is the link between the independent variables and the perceived success of managing revenue for beneficiary communities in the renewable energy sector in RSA.

It is therefore hypothesised that:

H11: There is a positive relationship between good governance and the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa.

4.5 Summary

Chapter 4 shows the detailed development of the conceptual theoretical model detailing the 10 independent variables and the relationship with the dependent variable the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa (H1-10) as well as the relationship between the intervening variable and the independent variable. The variables were empirically tested and verified through observation. The presentation of the model as well as the variables influencing the perceived success of managing revenue for beneficiary communities in the renewable energy sector in RSA were explained. The variables included: the use of specialist outside advice, the implementation of strategic financial management, incorporating change management processes, the level of human development, access to and the level of education, the use of support services. the need for strategic planning, strategic partnerships, the importance of infrastructure development, the benefits of project management and the importance of good governance. In Chapter 5, the research methodology is discussed including definitions of the instruments used to measure the proposed theoretical model.

Chapter 5
Research Design and Methodology

5.1 Introduction

Although research into revenue management systems is widespread, research into a model for managing revenue for beneficiary communities of renewable energy companies in RSA is very limited. The uniqueness of the REIPPP Programme has made this revenue management obligation a first for the country and perhaps the world. The research recorded in this study addresses the limitation of available research that identifies variables that might influence a theoretical model of managing revenue for beneficiary communities of renewable energy companies in RSA. The research, therefore, was aimed at developing model for managing revenue for beneficiary communities of renewable energy companies in RSA. The aim was to investigate and test revenue management systems for beneficiary communities empirically within the renewable energy sector in RSA. The purpose of this chapter is to describe the research design and methodology that was implemented to address research objectives. The chapter includes data collection methods, population and sampling methods, an explanation of how the research tool was designed and the nature of the research instrument.

5.2 Research Design

According to Mouton (1996), the main function of research design is to enable the researcher to anticipate what the appropriate research decisions are likely to be, and to maximise the validity of the eventual results. The research design is the conceptual structure within which research is conducted; it constitutes the blueprint for the collection, measurement and analysis of data. As such, the design includes an outline of what the researcher will do from writing the hypotheses and their operational implications to the final analysis of data (Kothari, 2004). Research design provides the overall structure for the procedure the researcher follows and the plan of investigation used to obtain empirical evidence in relation to the research problem (Leedy & Ormrod, 2005). The primary aim of the research design is to provide epistemic knowledge on the subject of managing revenue for beneficiary communities in the renewable energy sector.

To address the ain of the research study, the following research design objectives were identified:

- To develop a theoretical model which consists of the factors that will promote the successful management of revenue for beneficiary communities of renewable energy companies in RSA.
- To develop an appropriate measuring instrument that empirically tests the relationships described in the proposed theoretical model.
- To test the proposed model and the proposed hypotheses empirically by sourcing data from the relevant stakeholders in the RE and community development sector in RSA.
- To analyse the source data statistically.
- To propose specific recommendations based on the results of the statistical analysis and research findings.

Table 5.1: Research design steps

Number	Steps taken	Research design
1	Identify and collect primary and secondary literature sources about managing revenue for beneficiary communities	Secondary research
2	Literature reviews that focus on renewable energy	Qualitative research design by means of interpretation
3	Identification of variables that are perceived to influence the success of managing revenue for beneficiary communities in the renewable energy sector in RSA.	Qualitative research design by means of interpretation
4	Based on literature reviews develop a research instrument to test the hypotheses constructed on the basis of identified factors	Quantitative research design by means of interpretation

5	Test the measuring instrument through a pilot study: target a minimum of 25 respondents	Quantitative research design by means of interpretation
6	Adapt the measuring instrument where necessary and distribute it to identified groups both nationally and internationally: Target a minimum of 320 respondents	Quantitative research design by means of interpretation
7	Data analysis and hypothesis testing	Quantitative design
8	Draw conclusions and recommendations	Interpretation of quantitative design

5.3 Research Methodology

The research methodology refers to the researcher's general approach to carrying out the research project (Babbie & Mouton, 2001). Du Toit and Mouton (2013) state that in designing a methodology to investigate a problem, the researcher is building on an edifice of assumptions around claims to knowledge and these assumptions should be explored and justified where appropriate. According to the definition posited by Babbie and Mouton (2001: 647), research methods are the: "methods, techniques and procedures that are employed in the process of implementing the research design or research plan, as well as the underlying principles and assumptions that underlie their use". This section provides information on how the research design was implemented which includes:

- Methods of data collection
- Population and sampling methods
- An explanation of how the research instrument was designed
- An explanation of the nature of the research instrument
- Data collection and analysis
- Process and procedural methods

5.4 Method of Data Collection

Primary and secondary data collection were used for this research study. Secondary data is data that has already been collected and recorded by someone else, usually for other purposes (Blumberg, Cooper & Schindler, 2008). According to Mouton (2004), primary data is new data that the researcher has to collect for the research. The choice of data collection methodology was based on both qualitative and quantitative data collection methods (Creswell, 2007; Singh, 2007). Data collection using both methods and the description of how the data was collected is explained in the sections that follow. Qualitative data were collected first, analysed, and the findings were used to design a measuring instrument to collect quantitative data for the dominant part of the research. The data collection instrument was then used to collect the quantitative data. Creswell and Clark (2007: 121) refer to this process as “sequential data collection.” The results obtained from the questionnaires that were completed was then analysed statistically using Structural Equation Modelling (SEM).

Following ethical clearance to conduct the data collection, the researcher proceeded to collect data from 27 respondents. A sample of the covering letter for the research instrument is included in Appendices A and B.

5.5 Secondary Research

Data relevant to the renewable energy sector were collected from books, journals, working papers, articles and additional papers reviewed by the researcher. The scope of the secondary research included the status of renewable energy in the world, the BRICS nations, in Africa, in the SADC region and in RSA. The purpose of the secondary sources of literature was to ascertain the extent of revenue being managed for beneficiary communities in the renewable energy sector and the best practices employed by the sector. The study included research material and relevant studies conducted on the topic in other countries but more especially in RSA.

Other relevant publications included reports published by South African Government, the Independent Power Producers office in the Department of Energy, renewable energy agencies, research institutions and non-governmental institutions that are in some way connected with renewable energy and managing revenue for beneficiary communities. All elements of the research problem statement were researched and reviewed systematically to achieve the objectives stated in Chapter 1.

The research study also included a review of case studies of managing revenue for beneficiary community projects internationally and nationally. reports on renewable energy reviewed included:

- International Energy Agency (IEA)
- Renewable Energy Network (REN21)
- Global Wind Energy Council (GWEC)
- International Renewable Energy Agency (IRENA)
- World Wind Energy Association (WWEA)
- United Nations Environment Programme (UNEP)
- World Wildlife Fund (WWF)
- Greenpeace
- King Commission III
- Africa Progress Panel
- Department of Minerals and Energy (the RSA), (DME)

Non-academic publications on renewable energy were also reviewed. These included corporate annual reports about energy and managing revenue for beneficiary communities, regulatory bodies, banks, non-governmental bodies involved in the renewable energy sector and other renewable energy stakeholders. Comprehensive reviews of secondary sources through the NMMU University library were also conducted and included:

- Research projects in the University's research data bases
- Research journals published online by EBSCOhost
- Emerald Insight

- Science Direct
- Taylor and Francis Online

The researcher's own personal experience as a community operations manager for three large renewable energy companies as well as conversations with industry professionals all contributed to the secondary research.

5.6 Primary Research

The researcher used qualitative and quantitative research designs for primary research as indicated in Table 5.1 using a survey to collect the data. Surveys are a flexible tool, which can produce both qualitative and quantitative information depending on how they are structured and analysed (MacDonald & Headlam, 1999). Quantitative data offer the advantages that numbers have over words as measures of some attribute (Johnson, 2005). On the other hand, they also carry the disadvantages that numbers have, including a potential loss in richness of meaning (Johnson, 2005).

5.6.1 Qualitative Research Design

Qualitative research has been described as being primarily inductive because it is derived from real life observations and questions, and the researcher's understanding of the phenomenon generates theories or hypotheses (Bass *et al*, 1993; Creswell, 1994; De Vos, *et.al*. 2002; Botha, 2006). Qualitative methods are generally associated with the evaluation of social dimensions and provide results that are usually rich and detailed (MacDonald & Headlam, 1999). Qualitative methods can reveal how people feel and what they think, but cannot indicate how many of the target population feel or think that way as quantitative methods can (MacDonald & Headlam, 1999). However, qualitative data have the disadvantage of purely verbal descriptions (Babbie, 2010). The qualitative research therefore made use of literature and thinking from experts in the field of renewable energy and community development. The researcher's own practical experience as a community operations manager for three large renewable energy companies as well as conversations with industry professionals all contributed to the research. The primary literature highlighted pertinent issues regarding the management of revenue for beneficiary communities in the RE sector such as: the value of outside advisors, the importance of financial management, the importance of effective change management, the need for human development, the benefits of education, the need for support services, the need for strategic planning, the requirements for strategic partnerships, the importance of infrastructure development, and the benefits of project management. Ten hypotheses were developed from the identified independent variables and a research instrument was constructed from the variables.

5.6.2 Quantitative Research Design

The researcher made use of the descriptive research approach to profile the respondents. Descriptive research includes surveys and fact-finding enquiries of different kinds (Kothari, 2008). The main purpose of descriptive research is to describe the state of affairs as it exists in the present (Kothari, 2008). The purpose of using the descriptive research approach was to describe the correlation between the responses of the respondents and their relationship with the independent and dependent variables. The collection of data was done using a quantitative methodology because quantitative methods of data analysis can be of great value to the researcher when drawing meaningful results from a large body of qualitative data (Abeyasekera, 2005). The main benefit is that quantitative methodology provides the means to separate out the large number of confounding factors that often obscure the main qualitative findings (Abeyasekera, 2005).Therefore, the quantitative method of data analysis has both strengths and weaknesses as listed in Tale 5.2 (ACAPS, 2012):

Table 5.2: Strengths and weaknesses of conducting a survey		
Strengths	**Weaknesses**	**Comments on research instrument**
Numeric estimates	Gaps in information - issues which are not included in the questionnaire, or secondary data checklist, will not be included in the analysis	Most of the data pertinent to the research study was captured in the research instrument
Opportunity for relatively uncomplicated data analysis	A labour intensive data collection process	Data analysis using Structural Equation Modelling. Data were collected through an online questionnaire.
Data which are verifiable	Limited participation by affected people in the content of the questions or direction of the information collection process.	Questions were directed at industry professionals, community development practitioners and community-based organisations.
Data which are comparable between different communities within different locations	The inability of the researcher to ensure a sufficiently high return rate of questionnaires is a problem that researchers face.	Data are comparable between respondents connected to RE and those that are not.
Data which do not require analytical judgment beyond consideration of how information is presented in the dissemination process	Low number of returned questionnaires	Low returns on surveys might affect the relevance of the research findings.
Source: Adapted from AGPS (2005)		

5.7 Survey Research

The most common method of generating primary data is through surveys. A survey is a research technique in which information is gathered from a sample of people by using a questionnaire (Zikmund, 1994). Surveys are chiefly used in studies that have individual people as the units of analysis, and are probably the best method available to the social scientist interested in collecting original data for describing a population too large to observe directly (Farrington, 2009). Surveys are also excellent vehicles for measuring attitudes and orientations in a large population (Babbie & Mouton, 2001). According to Leedy and Ormrod (2005), survey research involves acquiring information about one or more groups of people, about their characteristics, opinions, attitudes or previous experiences by asking them questions and tabulating their answers (Leedy & Ormrod, 2005). A series of questions is posed by the researcher to willing respondents. The results from the responses to the questions are summarised as demographics, frequency, percentage and cumulative counts. The survey for this study covered the entire RE sector population in South Africa as well as community development practitioners which meant the survey research methodology was ideal.

5.8 Population and Sampling Methods

A population or universe refers to any complete group or body of people, or any collection of items under consideration for the purpose of research (Collis & Hussey 2003; Zikmund, 2003). The RE population is relatively small in RSA at present since the RE industry is relatively new. The community development population, however, is quite extensive and, therefore, it is very difficult to ascertain the overall research population size. However, the composition of the population that was targeted for this research study included practitioners from various sectors including the RE sector, governmental institutions, non-governmental institutions, renewable energy researchers, community development specialists and academics.

5.8.1 The RSA Renewable Energy Institutions

The following is an outline of the South African RE institutions that play a direct or indirect role in managing revenue for beneficiary communities in RSA. Some of these institutions, such as the government institutions, have a formalised oversight role because managing revenue for beneficiary communities in the renewable energy sector is obligatory and forms part of the implementation agreement agreed to by the IPPs with the DoE.

5.8.1.1 The RSA Department of Energy (DoE)

The DoE is the official department of the RSA Government responsible for the implementation of the energy policy. The DoE is accountable for ensuring responsible exploration, development, processing, utilisation and management of mineral and energy resources. It is mandated to oversee the transformation and governance of minerals and energy sectors, and to see to sustainable development. The DoE is mandated to ensure the secure and sustainable provision of energy for socio-economic development through the development of an integrated development plan, regulating the industries, and promoting investment in accordance with the integrated resource plan (GCIS, 2014). For the purposes of this study, which deals specifically with renewable energy, the applicable goals of the department are to (GCIS, 2014):

- ensure that there is an efficient and diverse energy mix for universal access within a transformed energy sector;
- ensure that environmental assets and natural resources are protected and continually enhanced by cleaner energy technologies;
- implement policies that adapt to and mitigate the effects of climate change;
- implement good corporate governance for effective and efficient service delivery.

The DoE also emphasises the broadening of electricity supply technologies to include renewable energy (wind, solar and hydro) to meet the country's future electricity needs and reduce carbon (CO_2), emissions (GCIS, 2014). The goals of the DoE include contracting for more than 20 000 megawatts of renewable energy, including an increased share from hydro-electricity (GCIS, 2014). To that end, the DoE has established the IPP office as a sub-department to focus specifically on renewable energy in RSA.

5.8.1.2 The Independent Power Producers (IPP) Office

In November 2010, the DoE and National Treasury entered into a memorandum of agreement with the Development Bank of Southern Africa (DBSA) to facilitate the implementation of the Independent Power Producers Procurement Programme (IPPPP) and to establish an IPP Office to supplement the DoE in its role as designated procurer of IPPs (DOE, 2015). While accountability for the procurement function resides with the DoE, the need to establish a function and capacity to execute the procurement mandate was recognised (DOE, 2015). The researcher had informal discussions with members of the IPP office about concerns that they might have regarding the state of revenue management for beneficiary communities by renewable energy companies.

5.8.1.3 The South African Wind Energy Association (SAWEA)

SAWEA is a not-for-profit association that represents the South African wind industry with a membership which includes national and international entities that are active in the entire wind energy supply chain (SAWEA, 2016). SAWEA's main mission is the removal of obstacles to the implementation of sustainable wind energy activities in Southern Africa. The organisation's website contains useful information relating to the renewable energy sector in RSA, specifically the wind energy sector, which has been pertinent to this research study.

5.8.1.4 Renewable Energy Researchers and Industry Experts

During this research study, a number of renewable energy and economic development researchers were identified and engaged. These included economic development practitioners, research analysts, community development officers, local economic development officers, community liaison officers, community project managers and various members of the public who are directly or indirectly connected to renewable energy or community beneficiation. Specialist and industry experts from the various institutions were invited to participate in the research study. The link to the online questionnaires was sent to public, private and academic institutions, both locally and internationally.

5.8.2 Categories of Respondents

The respondents to the survey included the following

- Senior managers of renewable energy companies
- Economic development managers of renewable energy companies
- Economic development practitioners
- Community development practitioners
- Renewable energy researchers based in RSA

5.8.3 Hypotheses Tested in this Research Study

Table 5.3 shows the hypotheses tested in this research study.

Table 5.3: Hypotheses tested by the research study

Hypothesis	Statistical test
H_1: There is a positive relationship between the use of specialist outside advice and the perceived success of managing revenue for beneficiary communities.	Multivariate and exploratory factor analysis
H_2: There is a positive relationship between the implementation of strategic financial management measures and the perceived success of managing revenue for beneficiary communities.	Multivariate and exploratory factor analysis
H_3: There is a positive relationship between incorporating change management processes and the perceived success of managing revenue for beneficiary communities.	Multivariate and exploratory factor analysis

H_4: There is a positive relationship between the level of human development and the perceived success of managing revenue for beneficiary communities.	Multivariate and exploratory factor analysis
H_5: There is a positive relationship between the access and level of education and the perceived success of managing revenue for beneficiary communities.	Multivariate and exploratory factor analysis
H_6: There is a positive relationship between the use of support services and the perceived success of managing revenue for beneficiary communities.	Multivariate and exploratory factor analysis
H_7: There is a positive relationship between the extent of strategic planning and the perceived success of managing revenue for beneficiary communities.	Multivariate and exploratory factor analysis
H_8: There is a positive relationship between the development of strategic partnerships and the perceived success of managing revenue for beneficiary communities.	Multivariate and exploratory factor analysis
H_9: There is a positive relationship between infrastructure development projects and the perceived managing revenue for beneficiary communities.	Multivariate and exploratory factor analysis
H_{10}: There is a positive relationship between project management methodologies and the perceived success of managing revenue for beneficiary communities.	Multivariate and exploratory factor analysis
H_{11}: There is a positive relationship between the use of specialist outside advice and good governance	Multivariate and exploratory factor analysis
H_{12}: There is a positive relationship between the implementation of strategic financial management measures and good governance.	Multivariate and exploratory factor analysis
H_{13}: There is a positive relationship between incorporating change management processes and good governance.	Multivariate and exploratory factor analysis
H_{14}: There is a positive relationship between the level of human development and good governance.	Multivariate and exploratory factor analysis
H_{15}: There is a positive relationship between the access and level of education and good governance.	Multivariate and exploratory factor analysis

H_{16}: There is a positive relationship between the use of support services and good governance.	Multivariate and exploratory factor analysis
H_{17}: There is a positive relationship between the extent of strategic planning and good governance.	Multivariate and exploratory factor analysis
H_{18}: There is a positive relationship between the development of strategic partnerships and the perceived success of managing revenue for beneficiary communities.	Multivariate and exploratory factor analysis
H_{19}: There is a positive relationship between infrastructure development projects and good governance.	Multivariate and exploratory factor analysis
H_{20}: There is a positive relationship between strategic planning and good governance.	Multivariate and exploratory factor analysis
H_{21}: There is a positive relationship between good governance structures and the perceived success of managing revenue for beneficiary communities.	Multivariate and exploratory factor analysis

5.9 Sample Unit and Sampling Method

The definition of a sample is that it is a subset of a population or group of participants carefully selected to represent the population (Cooper & Schindler, 2007; Collis & Hussey, 2003). There are two main categories of sampling methods: probability and non-probability sampling. Probability sampling is a technique by which the samples are gathered in a process that gives all the individuals in the population an equal chance of being selected (Explorable.com, 2009). Non-probability sampling is a technique by which units of the sample are selected on the basis of personal judgment or convenience (Zikmund, 2003). Convenience snowball, or non-probability sampling, was used in this research study rather than pure random or probability sampling because the sample populations could not be identified readily using probability sampling (File & Prince, 1996). The advantage of snowball sampling was that additional respondents were obtained from information received from initial respondents. This technique is used to locate members of rare populations by referrals (Cooper & Schindler, 2007; Zikmund, 1994). In this instance, the respondents were not readily identifiable because the RE sector managing revenue for SED and ED had only been implemented for just over one year when this research study was conducted.

As the snowball sampling progressed, databases were received from interested parties within the RE community and economic development sector. The potential respondents were then contacted by personal email and invited to participate in the study. The email also requested feedback from the participants and referrals to other potential respondents. The participants were requested to forward the questionnaire to other respondents whom they thought would be suitable to participate in the study. A dedicated email address was set up for the study to ensure that the data and feedback could be captured accurately and a database of respondents could be maintained.

5.10 Sample Bias

The researcher is constantly aware of any inherent bias that might affect the integrity of the research. A bias occurs when respondents either consciously or unconsciously tend to answer questions with a certain slant that misrepresents the truth (Zikmund, 2012). According to Leedy (1997), questionnaires especially fall victim to bias because researchers tend to be more concerned about the percentage return of the questionnaires than about the bias of the respondents who do return the questionnaires. In the current research study an attempt was made by the researcher to include a population that is directly or indirectly associated with managing revenue for beneficiary communities. According to Leedy (1989), random sampling would be an ideal sampling technique, as all the members of a population would have an equal and independent chance of being selected and bias is reduced. However, in this current study, the researcher made use of judgement sampling, where the researcher selected items deemed to be representative of the population (Kothari, 2004). However, although the population included were determined on the basis of judgement, the selection of units within each category, such as renewable energy, community development, local government and social responsible, was random (Elder, 2009).

5.11 Research instrument developed

An online survey in the form of a questionnaire was the method used to collect data. Surveys are used primarily in studies that have individual people as the units of analysis. It is the preferred method in cases where the population size it too big or widespread to observe directly. Surveys are also excellent vehicles for measuring attitudes and orientations in a large population (Babbie & Mouton, 2001). Based on the literature reviewed about revenue management for beneficiary communities in the RE sector in the previous chapters, a structured questionnaire was developed to source the primary data to test the hypothesised relationships depicted in the theoretical model. The research instrument is included in Annexure B.

5.11.1 Questionnaire Design

Collis and Hussey (2003) describe a questionnaire as a list of carefully structured questions, chosen after considerable testing, with a view to eliciting reliable responses from a chosen sample. The purpose of the measuring instrument in this research study was to source primary data to test the hypothesised relationships depicted in the theoretical model and, subsequently, to identify the factors influencing the perceived success of managing revenue for beneficiary communities of the renewable energy sector in RSA.

The measuring instrument used in this research study consisted of a covering letter and two sections sent by email (See Appendices A and B). The covering letter provided details about the purpose of the research study and the type of information that was required from the respondent. The covering letter also assured the respondent of anonymity and confidentiality as well as the approximate time it would take to complete the questionnaire. The email contained a quick link to the online survey which further explained how the questionnaire should be completed.

The survey was conducted under the auspices of the Developmental Studies Department at the Nelson Mandela Metropolitan University. Section A consisted of five demographic or qualifying questions related to the status and involvement .of the respondent with the renewable energy sector. Answers were chosen from a series of drop-down options from which respondents could select the most suitable.

Section B consisted of an instruction section using a 7-point Likert-type interval scale. Respondents were requested to indicate the extent of their agreement with regard to each statement in the questionnaire. Likert-type scales are used to quantify results and obtain shades of perceptions (Simon & Goes, 2013). Choices (or categories of responses) usually range from strongly disagree to strongly agree and the categories are distinguished by the numerical value of one unit. Likert-type scales are assumed to have equal units as the categories range from most negative to most positive (Simon & Goes, 2013). This allows measurement of attitudes, beliefs, and perceptions, and provides a means of quantifying the data. Items were designed to assess the factors influencing the success of managing revenue for beneficiary communities as perceived by the respondent. Adopting an interval scale for the measuring instrument enables the required, inferential, statistical data analysis to be undertaken (Cooper & Schindler, 2003; Leedy & Ormrod, 2005).
The Likert scale used for the questions in this study ranged from 1–7 where 1 = strongly disagree; 2 = disagree; 3 = somewhat/slightly disagree; 4 = neither agree nor disagree (neutral); 5 = somewhat/slightly agree; 6 = agree; 7 = strongly agree.

5.11.2 Qualifying Questions

5.11.2.1 Section A

For the purpose of the research study, Section A consisted of five questions to establish the demographic details of the respondent. The idea was to establish the respondent’s age, gender, level of education, experience in community development and connection with the renewable energy sector. Thus, in this research, demographic data are any data that provide an understanding of population size, distribution, and composition (Murdock & Ellis, 1991). The results are summarised in Table 5.4.

Table 5.4: Available demographics			
Total Respondents	Respondents in renewable energy	Respondents in community development	Respondents in both community development and renewable energy
219	116	103	52
100%	53%	47%	24%
National respondents		171	78%
International respondents		48	22%

The researcher extended the questionnaire to community development practitioners in the extraction industry in South Africa because the extraction industry has similar legislative obligations as the renewable energy sector in terms of the economic development of beneficiary communities. However, the number of respondents in the renewable energy sector alone (116) was deemed sufficient for the study. The main challenge was that South Africa is currently the only country with a Renewable Energy Independent Power Producers Programme (REIPPPP) where the surrounding communities derive direct monetary and shareholding benefits from the renewable energy facility (e.g. wind or solar farms).

5.11.2.2 Section B

Respondents were requested to indicate the extent to which they agreed or disagreed with a series of statements by using the indicated scales and marking in the appropriate box. The final questionnaire contained 60 worded statements. Although Likert-type scales are very common when survey instruments are used to measure variables in a study, they are also surrounded by controversy (Simon & Goes, 2013). It is important to understand the debate surrounding this measurement tool when statistics are needed to test a claim based on the data obtained from a survey using a Likert-type scale (Simon & Goes, 2013). This was borne in mind when the data was correlated and analysed.

5.12 Operationalisation of Variables

Research involves the measurement of concepts and constructs, which requires more rigorous definitions than, for example, those found in a dictionary (Farrington, 2009). Such definitions are known as operational definitions, which are stated in terms of specific criteria for testing or measurement (Farrington, 2009). The definition of operationalisation is to define specific testing or measurement criteria, the purpose of which is to provide a way of understanding and measuring concepts (Blumberg, Cooper & Schindler, 2008). The process of defining the constructs and their relationships must precede their empirical testing (Welman & Kruger, 2001). The specifications and procedures must be clear enough for anyone using these concepts to classify the object in the same way, as confusion about the meaning of concepts can destroy the value of a research study (Cooper & Schindler, 2007). Questionnaires represent a common and concrete illustration of the operationalisation process, and the questions themselves serve as the operationalisation of variables (Babbie & Mouton, 2001). Although the definitions do not guarantee accuracy, they assist the researcher to comprehend an abstract construct by means of concrete variables (Oberholster, 2014).

This section defines the variables of interest operationally as well as the process followed to develop valid and reliable scales of measurement. The formulation of the questions was done in such a way that five items measured each latent variable in the measuring instrument. The definitions of each of the variables in the conceptual model, namely independent variables, intervening variables and dependent variables follow.

5.12.1 Operationalisation of the Independent Variables

5.12.1.1 Outside Advice

For the purpose of this research study, outside advice refers to specialist consultants and experts in the field of renewable energy and revenue management who can add value to the process of revenue management and ensure sustainable and transformational socio-economic development in the beneficiary communities. This would include the streamlining of legal process, baseline assessments of beneficiary communities, finance management, strategic planning and change management, SED and ED project management, multi-stakeholder management and monitoring, evaluation and reporting procedures, all of which would grow and develop beneficiary communities and increase economic growth in the RSA.

5.12.1.2 Financial Management

For the purpose of this research study, financial management refers to the financial systems and processes employed to ensure sound financial management in an RE company which include the management of revenue for beneficiary communities. Factors such as financial planning and budgeting, financial controls, value management, governance and accountability contribute to the success of managing revenue for beneficiary communities.

5.12.1.3 Change Management

For the purpose of this research study, change management refers to all the participants, methodologies and activities that contribute to the success of managing revenue for beneficiary communities in a transformational and sustainable manner, thereby promoting human development, socio-economic development, creativity and innovation with a view to assisting in closing the poverty gap where it exists.

5.12.1.4 Human Development

For the purpose of this research study, human development refers to the increase of both capabilities and opportunities that ensure successful management of revenue for beneficiary communities; to improve the quality of life and life expectancy of community members in beneficiary communities including improved health, knowledge and skills, and the use people make of their acquired capabilities for leisure, productive purposes or being active in cultural, social and political affairs in beneficiary communities.

5.12.1.5 Education

For the purpose of this research study, education refers to formal and informal education and training that seeks to increase the success of managing revenue for beneficiary communities in the form of learnerships, mentorships, further education and training, educational support and resourcing that will improve the socio-economic circumstances of members of beneficiary communities so that they are able to access the economy and add to the growth of the local and national economy of the country.

5.12.1.6 Support Services

For the purpose of this research study, the term “support services” refers to the level of assistance to renewable energy companies that will allow them to improve their management of revenue for beneficiary communities, which goes beyond the capabilities of the company and its immediate service providers, thus including specialists in economic development, training, project and stakeholder management to promote successful socio-economic growth in the communities.

5.12.1.7 Strategic Planning

For the purpose of this research study, strategic planning refers to the formulation of achievable policy objectives for future growth and development of organisation over a period of years, based on its mission and goals and on a realistic assessment of the resources, human and material, that are available to implement the plan that will lead to the successful management of revenue for beneficiary communities. Strategic planning enables a company to incorporate long-term SD and ED initiatives that will have both a socio-economic and transformational outcome for the beneficiary communities.

5.12.1.8 Strategic Partnerships

For the purpose of this research study, strategic partnerships refer to the development of strategic alliances between governmental, non-governmental and private institutions or companies to pool resources, including funding, to undertake large projects that would otherwise not be undertaken by one entity because of the cost estimate. This requires the effective management of revenue for beneficiary communities. This includes taking advantage of multiple resources and skills that would otherwise not be accessible or affordable for a single RE company.

5.12.1.9 Infrastructure Development

For the purpose of this research study, infrastructure development refers to the physical systems of RE companies or beneficiary communities such as buildings, transportation, communication, sewage, water and electrical systems as well as Infrastructure governance that can contribute to the outcomes of successful management of revenue for beneficiary communities in RSA and thereby contribute to increased economic growth.

5.12.1.10 Project Management

For the purpose of this research study, project management refers to all the processes employed by RE companies that involve achieving SED and ED project objectives (schedule, budget and performance) through a set of activities that start and end at certain points in time and produce quantifiable and qualified deliverables for the successful management of revenue for beneficiary communities in the short-, medium- and long-term.

5.12.2 Operationalisation of the Intervening Variable: Good Governance

For the purpose of this research study, good governance refers to the influence of good governance practices and their relationship with the identified variables and the perceived success of managing revenue for beneficiary communities in RSA. This includes good governance infrastructure, processes, policies, systems and procedures.

5.12.3 Operationalisation of the Dependent Variable: Perceived Success of Managing Revenue for Beneficiary Communities

For the purpose of this research, the perceived success of managing revenue for beneficiary communities is defined as the degree to which the proposed model of revenue management results in an increase in the quality and sustainability of benefits for beneficiary communities in the short-, medium- and long- term, thus resulting in transformational socio-economic development that will add to the overall economic development of the country, better job creation and the reduction of poverty.

5.13 Administration of the Questionnaire

5.13.1 Pilot Study

According to Blumberg, Cooper and Schindler (2008), piloting questionnaires has saved countless survey studies from disaster by using the suggestions of the respondents to identify and change confusing, awkward and offensive questions and techniques that were adopted by researchers. As part of this research study, an initial 27 questionnaires were completed online and were assessed for reliability to reveal any final changes that needed to be made to ensure a better measure of success. Reliability is the extent to which measuring the same property repeatedly produces the same result (Thayer-Hart *et al,* 2010). Validity, on the other hand, is the extent to which a survey question measures the property it is supposed to measure (Thayer-Hart *et al.*, 2010). Ideally, each survey question will mean the same thing to everyone, including those administering the survey (Thayer-Hart *et al.*, 2010). The preliminary test carried out with 27 respondents was to ensure the following:

- ease of understanding of the questionnaire,
- the relevance of the items included in the questionnaire,
- the ease with which questions could be answered,
- the time required to complete the questionnaire.

The validity of the content of the measuring scales and the questionnaire was assessed by a research expert and academic. The research expert was given the construct definitions of the different variables and asked to assess whether the 60 questions in the measuring instrument were considered relevant, necessary, meaningful, and correctly worded, thereby checking the content validity. The content validity has been defined as "the degree to which an instrument has an appropriate sample of items for the construct being measured'' (Polit & Beck, 2004: 423).

Based on these initial reliability assessments and on the feedback received from the initial respondents, minor changes and corrections to the original questions were made before the questionnaire was finalised. The final items were then drafted in a random sequence and uploaded onto the NMMU survey website.

5.13.2 Validity and Reliability of the Data

The validity and reliability of measurement instruments influence the extent to which a researcher can learn something about the phenomenon under investigation, the probability that the researcher will obtain statistical significance in any data analysis, and the extent to which the researcher can draw meaningful conclusions from the data (Leedy & Ormrod, 2005).

5.13.2.1 Validity of the Research Instrument

According to Collis and Hussey, validity is concerned with the extent to which the data collected is a true reflection of what is being studied (Collis & Hussey 2003:186). Leedy and Ormrod and others (Leedy & Ormrod, 2005; Blumberg, Cooper and Schindler, 2008) contend that the validity of the research instrument is the extent to which the instrument measures what it is supposed to measure. Diamantopoulos and Schlegelmilch (2006) state that validity is the extent to which a particular measurement is free from both systematic and random error, which indicates the validity of the measure. According to Leedy and Ormrod (2005), the research approach selected must be validated for the accuracy, meaningfulness and credibility of the research approach and this can be addressed through internal and external validity.

In order to establish whether the measuring instrument used in the research study truly measured what it was supposed to measure, construct validity was considered. The construct validity refers to the degree to which a measure confirms a number of related hypotheses generated from a theory based on the constructs (Zikmund, 2003). Construct validity implies that the empirical evidence generated by a measure is consistent with the theoretical logic surrounding the constructs (Farrington, 2009). When researchers ask questions (or make statements) as a way of assessing an underlying construct, they should have obtained some kind of evidence that their approach does, in fact, measure the construct in question (Leedy & Ormrod, 2005). Construct validity is the extent to which the instrument measures a characteristic that cannot be directly observed but must be inferred instead from patterns in people’s behaviour (Leedy & Ormrod, 2005). This empirical study confirmed the construct validity of the measuring instrument and it is explained in detail in Chapter 6. The multivariate technique of exploratory factor analysis has been used to assess discriminant validity by numerous researchers (Venter, 2003; Adendorff, 2004; Han, 2006), and is also applied to test hypotheses with confirmatory models using SEM (Cooper & Schindler, 2007:592).

5.13.2.2 Reliability of the Research Instrument

Reliability applies to a measure when similar or consistent results are obtained over time and across situations (Zikmund, 2003). Reliability is concerned with estimates of the degree to which a measurement is free from random or unstable error, and a measuring instrument is considered to be reliable to the degree that it supplies consistent results (Cooper & Schindler, 2007: 321). Therefore, the chosen technique, applied repeatedly to the same object, would yield the same result each time (Mouton & Babbie, 2001). Reliability is the extent to which the obtained scores may be generalised to different measuring occasions and forms of measurement (Mouton, 1996; Welman & Kruger, 2001).

The researcher paid close attention to the formulation of the questions based on the literature reviews in Chapters 2, 3 and 4 that were pertinent in the formulation of the theoretical model of the perceived success of managing revenue for beneficiary communities in the RE sector in RSA. The high level of the researcher's knowledge of the domain acquired over 25 years in the field of community development, also contributed immensely to the formulation of the measurable questions. The researcher was mindful of the possible sources of errors that could have taken place during the data collection and which might have had an effect on the reliability of the data as noted by Kothari (2004):

- Respondent: At times the respondent may be reluctant to express strong negative feelings or it is just possible that the respondent might have very little knowledge but might not admit this ignorance;
- Situation: Situational factors might also hinder correct measurement. Any condition which places a strain on the respondent can have serious effects on the accuracy of the data;
- Instrument: Error might arise because of a defective measuring instrument. The use of complex words, beyond the comprehension of the respondent, ambiguous meanings, poor printing, inadequate space for replies, omission of response choice, etc. are a few things that make the measuring instrument defective and might result in measurement errors.

The reliability of the measuring instrument (questionnaire) was tested for internal consistency for survey constructs using Cronbach's alpha co-efficients for the factors. According to Christmann and Van Aelst (2006), Cronbach's alpha is a popular method to measure reliability, for example, in quantifying the reliability of a score to summarise the information of several items in questionnaires.

5.13.3 Cronbach's alpha Measurement

The Cronbach's alpha co-efficient is widely used as a reliable procedure to indicate how well various items are positively correlated to one another (Drucker-Godard *et al.,* 2001; Sekaran & Bougie, 2010). The Cronbach's alpha is constructed on the inter-item correlations. If the items are strongly correlated to each other, the internal consistency of the items is high and the alpha co-efficient will be close to one. However, if the items are poorly formulated and do not correlate strongly with each other, the alpha co-efficient will be close to zero (Vosloo, 2014). Cronbach's alpha co-efficient is a very suitable assessment of the reliability of the construct indicators, because it has the most utility for multi-item scales at the interval level of measurement (Cooper & Schindler, 2001).
Therefore, the Cronbach's alpha reliability co-efficient was used to assess the consistency of the entire scale of the research instrument. According to Hair *et al.,* (1998: 118), the generally agreed lower limit for the Cronbach's alpha co-efficient is 0.70 but it can be decreased to 0.60 in the case of exploratory research.

5.14 Method of Data Analysis

Once the reliability of the measuring instrument has been established, the theoretical model can be tested statistically. Inferential statistics allow a researcher to make inferences about whether relationships observed in a sample are likely to occur in the wider population from which that sample was drawn (MacDonald & Headlam, 1999). With inferential statistics, it is important to have a sound understanding of the population (the set of individuals, items, or data, also called the universe) and the sample (a sub-set of elements taken from a population), (MacDonald & Headlam, 1999). Inferences (conclusions) are made about a population from a sample taken from it. Therefore it is important that population and sampling is well understood, as any error will influence the researcher’s inferences (MacDonald & Headlam, 1999). If the research is able to establish a relationship between the variables that appears in the research hypothesis, it is expected of the research hypothesis and chosen statistical methodology to bring this relationship to light as the researcher wishes to draw statistically valid conclusions about the population being researched. Therefore, the causal interpretation must be based on the theoretical grounding of empirical support for a proposed model (Pearl, 2000).

5.14.1 Structural Equation Modelling (SEM)

Hair *et al.* (1998) indicate that numerous multivariate, statistical, analysis methods provide researchers with powerful tools for addressing a wide range of managerial and theoretical questions (Hair, 1998). Unfortunately, they all share one common limitation in that each technique can examine only a single relationship at a time (Adendorff, 2004). Hair *et al.* (1998) also indicate that even those techniques which allow for multiple dependent variables, such as multivariate analysis of variance, still only present a single relationship between the dependent and independent variables at one time (Adendorff, 2004). This statistical limitation has been overcome with the development of SEM, which is a multivariate technique that combines aspects of multiple regression and factor analysis to estimate a series of interrelated dependence relationships simultaneously (Adendorff, 2004). The advantage of SEM is that it has the ability to employ multiple measures to represent a construct in a manner similar to factor analysis (Hair *et al.* 2006).

According to Lee and Zhu (2000) and Shah and Goldstein (2005), SEM is a technique that is used to specify, estimate and evaluate models of linear relationships among a set of observed variables (also referred to as manifest variables or indicators) and unobserved variables (also referred to as latent variables) that can either be independent (exogenous) or dependent (endogenous).

Therefore, SEM has two distinct advantages: (1) it provides a straightforward method of dealing with multiple relationships simultaneously while providing statistical efficiency, and (2) it has the ability to assess the relationships comprehensively and provide a transition from exploratory to confirmatory analysis (Adendorff, 2004). SEM consists of two parts: (1) the structural model that indicates potential causal dependencies between independent and dependent variables, and (2) the measurement model showing the relationships between the latent variables and the indicators (Lee, 2007 & Garson, 2012). It needs to be noted however that, when undertaking structural equation analysis, the sample size should not be small, as SEM relies on tests which are sensitive to sample size as well as to the magnitude of differences in co-variance matrices. In the literature reviewed, sample sizes commonly vary from 200 to 400 for models with 10 to 15 indicators (Farrington, 2009). In this research study, the sample size consisted of 219 respondents.

5.14.2 The Role of Theory in Structural Equation Modelling

Theory provides the rationale for almost all aspects of SEM because it is considered to be a confirmatory technique, a technique which is useful for testing and potentially confirming theory (Farrington, 2009). There are two basic conditions suggested for the successful use of SEM: firstly, that the model has sound theoretical underpinning and, secondly, that a sound modelling strategy is adopted (Hair *et al.,* 1995; Venter, 2002).

In order to meet these conditions, in the first instance, a detailed and accurate questionnaire has to be developed, on the basis of the findings in a literature review, in order to provide a theoretical foundation of variables (observable questions) to measure the theoretical constructs (latent variables) for the model under investigation (Adendorff, 2004).

A theory-based approach is a necessity for the SEM technique, which needs to be specified by the researcher (Hair, 1998). The researcher must conduct an extensive literature review to obtain theoretical justification for the model, which forms the basis that reinforces the model of SEM (1998). A theoretical model is particularly needed when modifying the model and serves the purpose of directing the estimation development (Hair *et al.,* 2006)

The flexibility of SEM, however, does create a relatively high risk of “over-fitting” the model, or developing a model with general ability (Hair *et al.,* 2010: 590). As a result, SEM is a confirmatory system, guided more by theory than by empirical results (Hair *et al.,* 1998).

Secondly, the development of a modelling strategy is the next condition for the successful application of SEM. There is no single correct method of applying multivariate techniques (Hair, 2006). The modelling strategy is dependent on the formulation of the objectives to be achieved and the application of the appropriate method in the most correct manner. There are three separate modelling strategies that are proposed, namely: the confirmatory modelling strategy; the competing models strategy; and the model development strategy (Garson 2006; Hair *et al.* 2006: 732; Hair *et al.* 1998: 590-592). The confirmatory modelling strategy was adopted to apply SEM for this research study. When using this strategy, a single model is specified and SEM is used to assess how well the model fits the data (Hair *et al.* 2006: 732). Therefore, for the purpose of the present research study, the application of SEM is used to test and potentially confirm the factors identified as influencing the perceived success of managing revenue for beneficiary communities in the renewable energy sector in RSA.

5.14.3 Steps of Structural Equation Modelling

The following seven steps of SEM were proposed by Hair *et al.* (2010):

1) Develop a theoretical model.
2) Construct a path diagram of causal relationships.
3) Convert a path diagram into a set of structural equations and measurement equations.
4) Choose the input matrix and estimate the proposed model.

5) Assess the identification of the structural model.
6) Evaluate the results for goodness of fit.
7) Make theoretically justified modifications to the model.

A brief explanation of each of the seven steps and a description of how they were implemented in each stage of the research process follows.

5.14.3.1 Step 1: Developing a Theoretical Model

Hair *et al.* (1998) contend that SEM is based on causal relationships in which the change in one variable is assumed to result in a change in another variable. Hair *et al.* (1998) also specify that the strength and conviction with which the researcher can assume causality between two variables lies in the theoretical justification to support the analysis, and not in the analytical methods chosen. According to Venter (2002), the theoretical justification of the model to be investigated is the foundation that underpins the method of structural equation analysis.

In Chapter 4, a theoretical model was presented for testing, which was based on the findings of the literature reviews in Chapter 2 and 3. The different factors that could influence the perceived success of managing revenue for beneficiary communities (the dependent variable) were presented and links among the numerous factors were hypothesised.

5.14.3.2 Step 2: Constructing a Path Diagram of Causal Relationships

A path diagram portrays the dependence relationships between two constructs included in the theoretical model under investigation and therefore the effect that one construct has on another. Path diagrams are a convenient way of portraying a model in a visual form (Hair, 2006). Path diagrams enable the researcher to depict the predictive relationships amongst constructs visually (i.e. the independent-dependent variable relationships) as well as the associative relationships (correlations) amongst constructs and even indicators (Farrington, 2009). However, SEM alone cannot establish causality and, therefore, path diagrams are especially helpful in depicting a series of causal relationships (Hair *et al*., 1998).

Hair *et al*. (1998) indicate that a path diagram is more than just a virtual portrayal of the relationships, for it allows the researcher to present not only the predictive relationships amongst constructs (i.e. the independent-dependent variable relationships), but also the associative relationships (correlations) amongst constructs and even indicators. In constructing a path diagram of causal relationships, the hypothesised relationships amongst the constructs included in the model under investigation are portrayed (Adendorff, 2004).

In a path diagram, dependence relationships are depicted by a straight arrow, with the arrow emanating from the predictor variable (independent variable) pointing to the dependent construct or variable (Hair, Black, Babin & Anderson, 2010). Curved arrows represent correlations between constructs or indicators, but no causation is implied (2010). In a path diagram, an endogenous or dependent construct is referred to as a variable that is predicted or caused by any other constructs in the model. A variable that is not predicted or caused by another variable in the model is referred to as an exogenous construct or independent variable, and no arrows point to these constructs from other constructs (Lee, 2007). Intervening variables are variables which are both effects of other exogenous (intervening) variables and are causes of other intervening and dependent variables (Garson, 2008). The path diagrams suggested for this research study are presented in Chapter 7.

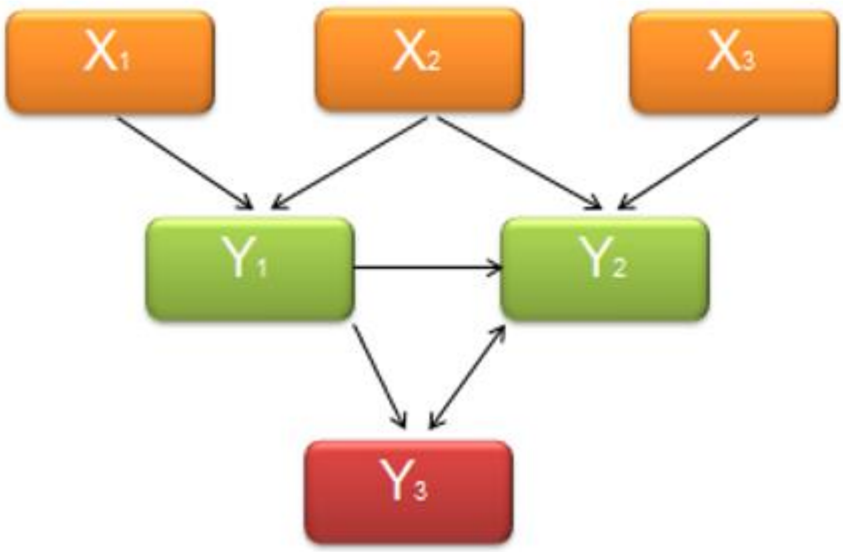
5.14.3.3 Step 3: Converting a Path Diagram into a Set of Structural Equations and Measurement Equations

It is necessary to present the model in more formal terms using a set of equations. The equations define the structure linking constructs, the measurement model, and set of matrices that indicate the hypothesised correlations between the constructs or variables (Oberholster, 2014). Hair *et al* (2010) further points out that the objective of the equations is to link the operational definitions of the variables to theory in order to subject them to appropriate empirical tests.

The SEM model comprises two models: the measurement model and the structural model (Hair *et al.*, 2010). The measurement model (1) specifies the indicators for each construct and (2) enables an assessment of construct validity of which these are the two major steps in a complete structural model analysis (Hair *et al.*, 2010). Secondly the structural model is a set of one or more dependence relationships linking the hypothesised constructs of the model. The structural model is most useful in representing the inter-relationships of variables between constructs (Hair *et al.*, 2010). The process is then followed by specifying a set of matrices indicating any hypothesised correlation between the constructs or variables.

For each equation, a structural co-efficient (b) is estimated and an error term (E) is included to provide for the sum of the effects of specification and random selection errors. Figure 5.1. is an example of a path diagram that will be converted into structural equations.

Figure 5.1: Path diagram example indicating structural relationships



Source: Hair *et al.* (1998)

Figure 5.2: Structural Equation Example

Source: Hair *et al*. (1998)

It can be seen from figures 5.1 and 5.2 that X_1 and X_2 have an effect on the endogenous variable Y_1, and that provision is made for the measurement and specification error E_1 of the magnitude b_1 and b_2. Y_2, in turn, is influenced (co-efficients b_3 and b_4,) by the exogenous variables X_2, X_3, and Y_1, and provision is made for the measurement and specification error (E_1). The endogenous variable Y_3 is influenced by endogenous variables Y_1 and Y_2, to the extent of b_6 and b_7, with an error term E_1 (Hair *et al.,* 1998).

5.14.3.4 Step 4: Choosing the Input Matrix and Estimating the Proposed Model

SEM will use either a co-variance or a correlation matrix as its input matrix (Hair *et al.,* 1998). According to Hair *et al.* (1998), for confirmatory factor analysis, either type of input matrix can be utilised but, since the objective is an exploration of the pattern of relationships across respondents, correlations are the preferred input data type (Hair *et al.,* 1998). This then activates the correlation of the co-variance matrix of all the indicators in the model (Hair *et al.,* 1998). According to Venter (2002), the measurement model then specifies which manifest variables (indicators) correspond with each latent construct and, in so doing, the structural co-efficients will estimate the relationships between the latent variables.

Once the structural and measurement models have been specified and the input data have been selected, the computer programme for estimation is then chosen. The computer programme LISREL (Linear Structural Relations) version 8.54 was used in the current study. Hair *et al.* (1998: 619) mentions that, because of the estimation procedure, constructs must be made scale-invariant so that the indicators are “standardised” in order to compare the constructs. Two approaches are used for this procedure: firstly, to set one of the loadings in each construct to the fixed value of 1.0 and, secondly, to estimate the construct variance directly. Hair *et al.* (1998: 619) concur that either approach results in the same estimates but, for theory testing purposes, the second approach is recommended.

5.14.3.5 Step 5: Assessing the Identification of Model Equations

During Step 5, the research analyst assesses whether the computer programme has produced any meaningless or illogical results in the identification of the structural model. The following is a list of four symptoms of identification problems noted by Venter (2002):

1) Very large standard errors for one or more co-efficients;
2) The inability of the programme to invert the information matrix;
3) Unreasonable and impossible estimates such as negative error variances; or
4) High correlations of approximately 0.90 or greater amongst estimated co-efficients.

Hair *et al.* (2010) points out that if these identification problems are encountered, the researcher should check the following three, main causes:

1) Large numbers of estimated co-efficients relative to the number of variances or correlations which are indicated by a small number of degrees of freedom;
2) Reciprocal effects (the use of two-way causal arrows between two constructs); or
3) Failure in fixing the scale of a construct.

The solution to an identification problem is to impose more constraints on the model in order to eliminate some of the estimated co-efficients (Adendorff, 2004).
This should be followed by a controlled process of adding more constraints and deleting paths from the path diagram until the problem is corrected. Attempts are therefore made to achieve an over-identified model that has degrees of freedom available to provide a better estimation of the true causal relationships (Hair *et al.,* 1998).

5.14.3.6 Step 6: Evaluating the Results for the Goodness-of-Fit (GOF)

According to Hair *et al.* (2010), the goodness-of-fit (GOF) is a measure indicating how well a specified model reproduces the co-variance matrix among the indicator variables (Hair *et al.*, 2010). The evaluation of the goodness-of-fit results is an assessment of the extent to which the data and the theoretical models meet the assumptions of SEM (Farrington, 2009). After the model has been established to provide acceptable estimates, the goodness-of-fit has to be established for the overall model and then separately for the measurement and the structural models (Adendorff, 2004). According to Venter (2002), further assumptions must include: that the observations were independent; that a random sampling of respondents was conducted; and that all relationships were linear.

Hair *et al.* (2010) notes that a number of alternative GOF models are available to the researcher and, even though each GOF measure is unique, they are classed into three general groups: absolute measures, incremental measures, and parsimony fit measures (Hair *et al.*, 2010). Firstly, absolute measures assess the overall fit of the model, both structural and measurement fit collectively, with no adjustment for the degree of over fitting that might occur. Secondly, increment fit measures compare the proposed model to another model specified by the researcher. Thirdly, parsimonious fit measures adjust the measures of fit to provide comparisons between models with differing numbers of estimated co-efficients, in order to determine the number of fit by the estimated co-efficients (Hair *et al.*, 2010).

The closer the structural model compares to the structural model's GOF to the measurement model, the better the structural model fit (Hair *et al.*, 2010). Goodness-of-fit (GOF) tests are measures of how closely the actual or observed input correlation or co-variance matrix matches the matrix that is predicted by the theoretical model (2009). For the purpose of this research study, an assessment of the overall fit of the model of factors that influence the management of revenue for beneficiary communities in the renewable energy sector in RSA was made during the evaluation step. In Chapter 6, an assessment is provided that reflects the results of the absolute fit measures based on the Robust Maximum Likelihood method of estimation which reflects the assessed relationships rather than obtaining a good model fit.

5.14.3.7 Step 7: Making the Indicated Modifications to the Model if Theoretically Justified..

The last step in structural equation analysis involves modifying the proposed model in search of a better fit. According to (Hair *et al.,* 2010), during this step, the results should be examined for their correspondence to the proposed theory. In maximising the fit of the model, the researcher must fix parameters that were formerly free or free parameters that were formerly fixed (Cooper & Schindler 2007: 584). Additionally, modifications to the model include the process of adding or deleting estimated parameters from the original model. These modifications should be made with great care and only after theoretical justification has been obtained for what is deemed empirically significant (Hair *et al.,* 2010). The researcher must ensure that the principal relationships in the theory are still supported even if the modifications are found to be of statistical significance. Modifications must be theoretically justified and deemed empirically significant, and must have highlighted that a theoretical model is supported and considered valid to the extent to which the parameter estimates are statistically significant and in the predicted direction (Hair *et al.*, 2010).
Identification of the significant causal relationship is important in the interpretation of the results. Residual values greater than 2.58 are to be considered statistically significant of the 0.05 level (Hair *et al.,* 1998). Modification indices should also be inspected. A value of 3.84 or greater suggests that a statistically significant

reduction in the chi-square is obtained when the co-efficient is obtained (Hair *et al.,* 1998).

5.14.4 The Use of a Software Programme

For the current research study, the software programme LISREL 8.8 (Jöreskog & Sörbom 2006) was used to convert the path diagrams referred to into structural equations (structural models) and measurement models as represented in Chapter 7. The name of the software was derived from LInear Structural Relations. LISREL was not the first software to perform SEM or path analysis, but it was the first to gain widespread usage (Hair *et al.*, 2010). A key element in the path diagram is the labelling notation for indicators, constructs and relationships between them (Hair *et al.*, 2010). Each software program uses a unique approach, although a standard convention has been associated with LISREL that is simply referred to as LISREL notation (Hair *et al.*, 2010). Although widely used, LISREL notation is tied uniquely to the program's use of the matrix notation and thus it becomes unwieldy for those who have no experience with LISREL (Hair *et al.*, 2010). The software therefore requires that the researcher knows the underlying assumptions of the chosen application method, as well as how to apply and report these assumptions correctly.

5.15 Summary

Detailed descriptions of all the processes to pre-test the proposed theoretical model have been provided in Chapter 5. These included a description of the population studied, the sampling unit and the sampling technique. The variables were operationalised through clear and concise definitions and an explanation was also given on how the measuring instrument was developed and administered. The demographic information required from the respondents was also provided in this chapter. A description of Structural Equation Modelling (SEM), which is the statistical technique used in this research study to ensure the reliability and validity of the findings, was provided. In Chapter 6, detailed feedback based on the statistical analysis performed is presented.

Chapter 6
Empirical Results

6.1 Introduction

Chapter 5 provided an overview of the research design and methodology used to investigate the factors influencing the perceived success of managing revenue for beneficiary communities. The empirical data were subjected to a variety of different statistical analyses to assess the validity and reliability of the measuring instrument. With the use of Structural Equation Modelling (SEM), the theoretical model was tested empirically.

Chapter 6 begins with a summary of the results of the exploratory factor analysis. The discriminant validity of the constructs in the theoretical model were either confirmed or redefined, depending on the findings. Once the reliability of these constructs had been confirmed, using a Cronbach’s alpha co-efficient analysis, the theoretical model proposed in Chapter 4 was revised to reflect only those constructs that demonstrated sufficient discriminate validity and reliability. A path diagram was then constructed to present the relationships between these constructs and was then converted into a structural model for which the path co-efficients of the relations were estimated. The goodness-of-fit of the theoretical model to the empirical data that was presented by the analysis was then assessed. An assessment of the relationships between various input and process constructs was made.

6.2 Validity of the Measuring Instrument

Validity is the degree to which a measure accurately represents what it is supposed to (Hair, Black, Babin & Anderson, 2010). In the present study an exploratory factor analysis (EFA) was employed to assess the discriminant validity of the instrument used to measure the constructs incorporated in the theoretical model using IBM Statistical Product and Service Solutions 23 (SPSS 23) for Windows, prior to the implementation of SEM. In this study, the sample size was 219 respondents and the measuring instrument contained 60 questionnaire items. Owing to the limited sample size, the entire matrix of responses in the present study could not be subjected to a single exploratory factor analysis and, consequently, the model was split into three sub-models: Sub-model A (Multi-sector participation), Sub-model B (Transformational change), and Sub-model C (Sustainable initiatives). Each sub-model was individually factor analysed. In sub-models where it was expected that the factors would be correlated, Principal Axis Factoring was used as the factor extraction method. Once the initial solutions were obtained, the loadings were subjected to Oblique Rotation (direct quartimin), which accounts for the correlation between the factors in addition to the loadings (Newsom, 2005). Bartlett's Test of Sphericity, which compares the observed correlation matrix to the identity matrix, was used to assess the factor-analysability of the data in all three sub-models. In determining the number of factors to extract for each sub-model, Eigenvalues, the Percentage of Variance, was explained, and the individual factor loadings were considered.

In order to assess the factor-analysability of the data, the IBM software programme, SPSS 23, includes Bartlett's Test of Sphericity and Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy. The closer the KMO is to 1, the more factor-analysable the data. It is suggested that a KMO near 1 permits a factor analysis and that anything less than 0.5 does not (Rennie, 2002). According to Kaiser (1974: 31-36), KMOs in their 0.70s are considered as “middling”, whereas values below 0.70 are considered as “mediocre”, “miserable” or “unacceptable”. Consequently, for the purpose of this study, data with KMOs of >0.7 (p<0.00) are considered factor-analysable. Eigenvalues are used to explain the variance captured by the factor. Eigenvalues greater than 1 are considered significant, whereas factors with Eigenvalues less than 1 are considered insignificant and are discarded (Hair *et al.*, 2010). In this study, in exceptional cases, factors with Eigenvalues lower than 1 were considered for retention provided that the factors (and items) could be interpreted.

Factor loadings indicate the correlation between the original variables and the factors, and are the key to understanding the nature of a particular factor (Hair *et al.*, 2010). Data items measuring a similar aspect would have high loadings on (i.e. correlations with) one specific factor and low loadings on another (Hair *et al.*, 2010). Squared factor loadings indicate what percentage of the variance in an original variable is explained by a factor (Hair *et al.*, 2010). According to Hair *et al.* (2006), factor loadings of 0.30 and 0.40 are considered significant for sample sizes of 350 and 200 respectively. In Section 6.4, the extraction and rotation method, as well as KMO and Bartlett's Test of Sphericity, is reported for each sub-model. The Eigenvalues and the Percentage of Variance are also explained, and the individual factor loadings for each construct, extracted by means of an exploratory factor analysis, are given.

6.3 Reliability of the Measuring Instrument

Reliability measures the degree to which a set of indicators of a latent construct are internally consistent in their measurements (Hair *et al.*, 2010). The indicators of highly reliable constructs are highly inter-related, indicating that they all seem to measure the same thing (Hair *et al.*, 2010). Once again, the software programme SPSS 23 for Windows was used to calculate the Cronbach's alpha co-efficient for each of the factors identified during the exploratory factor analysis. In the present study a Cronbach's alpha co-efficient of greater than 0.70 is used to indicate that a factor is reliable (Nunally 1978:226; Nunnally & Bernstein 1994; Peterson 1994).

6.4 Factors Influencing the Perceived Success of Managing Reveneue for Beneficiary Communities

In the following section, measures of factor-analysability, discriminant validity, and reliability are reported for sub-models A, B and C and the resultant factors are identified. The pattern matrix for each factor for each sub-model has also been tabled.

6.4.1 Sub-model A: Multi-Sector Participation

For Sub-model A, labelled *Multi-sector participation*, the Principal Axis Factoring estimation method with an Oblique Rotation(Oblimin with Kaiser Normalisation) was specified as the extraction and rotation method. Bartlett's Test of Sphericity returned a KMO value of 0.91 ($p<0.00$) indicating that the data were factor-analysable. In Sub-model A, items expected to measure the factors: *outside advice, financial management, strategic partnerships, support services and good governance* were assessed for discriminant validity by means of an exploratory factor analysis.

Initially the number of factors to be extracted was not specified, but the Eigenvalues suggested a total of five factors to be used as the independent variables in sub-model A. The final solution was reached through an iterative process of deleting items that did not demonstrate sufficient discriminant validity (low loading and cross-loading) and re-running the exploratory factor analysis until all the remaining items loaded to a significant extent ($p \geq 0.4$) with no cross-loadings (i.e. loaded on only one factor). The most interpretable factor structure is presented in Table 6.1. All items with loadings <0.4 were deleted. The independent variables were firstly analysed and the following results were obtained:

Table 6.1: Rotated factor loadings: Sub-model A

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
	Good governance	Distinctive benefits	Support services	Outside advice	Financial management
GG3	0.955	0.049	0.028	-0.078	-0.067
FM5	0.823	-0.070	-0.016	0.035	0.026
GG2	0.809	-0.005	-0.004	0.109	-0.080
GG4	0.723	-0.012	-0.033	0.087	0.038
GG5	0.663	0.087	0.001	-0.079	0.127
FM3	0.520	0.077	-0.051	-0.051	0.269
GG1	0.417	-0.109	-0.052	0.151	0.235
OA1	0.038	0.938	0.116	0.005	-0.013
OA3	-0.004	0.591	-0.179	0.207	-0.015

SS1	-0.008	0.554	-0.220	-0.041	0.112
SS5	-0.023	-0.005	0.947	0.011	-0.041
SS4	0.050	0.046	0.638	-0.020	0.072
OA2	0.016	0.026	0.094	0.693	0.113
OA4	0.101	0.025	-0.152	0.457	0.062
OA5	0.073	0.034	-0.258	0.430	-0.201
FM1	0.048	0.033	0.024	0.108	0.738
FM2	0.102	0.027	-0.072	0.028	0.696
Eigenvalue:	6.969	2.632	1.037	0.875	0.772
Rotation converged in 8 iterations					
Loadings in red represent significant loadings (p≥0.4)					

Table 6.1 shows that a total of 17 items (4 independent variables and 1 intervening variable) were grouped into five factors, and explained 72.27% of the variance in the data. The same procedure with the factor analyses of the intervening variable was followed.

6.4.1.1 Factor 1: Intervening Variable - Good Governance

All 5 items expected to measure the construct: *good governance* loaded together on one factor as expected. *Good governance* explained 41.00% of the variance in the data and an Eigenvalue of 6.97 was reported in Table 6.2. Two items expected to measure the factor *financial management* also loaded on the factor *good governance*. All factor loadings exceeded 0.4 and were thus regarded as significant. Sufficient evidence of discriminant validity of the construct was thus provided. The Cronbach's alpha co-efficient of 0.91 for *good governance* suggests that the instrument used to measure this construct was reliable.

Table 6.2: Sub model A - Factor structure - Good governance				
Eigenvalue: 6.97 % of Variance: 41.00		Cronbach's alpha: 0.91		
Item	**Question**	**Factor loading**	**Item-total correlation**	**Cronbach's alpha if item deleted**
GG3	Good governance can help to build trust between our organisation and the beneficiary communities	0.955	0.819	0.891
FM5	Effective strategic financial management promotes accountability of our organisation	0.823	0.806	0.892
GG2	Good governance improves relationships between our organisation and the beneficiary communities.	0.809	0.760	0.898
GG4	Good governance ensures that our organisation acts with integrity when involved in community development projects	0.723	0.762	0.897
GG5	Good corporate governance is essential to effective infrastructure development in beneficiary communities	0.663	0.705	0.903
FM3	Strategic financial management is important to ensure successful community development projects	0.520	0688	0.905
GG1	Our organisation believes in the value of good governance in all our activities.	0.417	0.615	0.912
Loadings in red represent significant loadings (p≥0.4)				

Despite the inclusion of 2 of the items loading on to the factor: *good governance*, the operationalisation of *good governance*, as described in Chapter 5, remains unchanged. For the purposes of this study, *good governance* refers to the influence of good governance practices and their relationship with the identified variables and the perceived success of managing revenue for beneficiary communities in RSA that includes good governance infrastructure, processes, policies, systems and procedures.

6.4.1.2 Factor 2 – Distinctive Benefits

Only 2 of the 5 items (OA1 and OA3) expected to measure the construct: *outside advice* loaded together on Factor 2. Three items, namely OA2, OA4 and OA5 loaded on Factor 4 which also measured *outside advice*. The inclusion of one of the items (SS1) loading on to the factor: *outside advice* resulted in this construct being renamed: *distinctive benefits*, and redefined based on the results of the factor analysis.

Distinctive benefits explained 15.49% of the variance in the data and an Eigenvalue of 2.63 was reported in Table 6.3. All factor loadings exceeded 0.4 and were thus regarded as significant. Sufficient evidence of discriminant validity of the construct was thus provided. The Cronbach's alpha co-efficient of 0.82 for *distinctive benefits* suggests that the instrument used to measure this construct was reliable.

Table 6.3: Sub model A - Factor structure — Distinctive benefits

Eigenvalue: 2.63 % of Variance: 15.49		Cronbach's alpha: 0.82		
Item	**Question**	**Factor loading**	**Item-total correlation**	**Cronbach's alpha if item deleted**
OA1	Our organisation makes use of outside consultants to provide expert advice on community development	0.938	0.710	0.710
OA3	Our organisation makes use of various outside experts for our community development projects.	0.591	0.677	0.744
SS1	Our organisation makes use of support services to enhance community development projects.	0.554	0.631	0.789
Loadings in red represent significant loadings (p≥0.4)				

The operationalisation of *distinctive benefits* for the purpose of this study refers to the use of the services of highly specialised outside consultants and experts in the field of community development that provide unique and community-specific benefits for the beneficiary communities, for example, language, culture and baseline knowledge of the specific area's needs and risks.

6.4.1.3 Factor 3: Support Services

Only 2 of the 5 items used to measure the construct: *support services* loaded together on this factor. The item SS3 did not load on any of the factors and was deleted and therefore not used in the subsequent analysis. *Support services* explained 6.10% of the variance in the data and an Eigenvalue of 1.04 was reported in Table 6.4. All factor loadings exceeded 0.4 and were thus regarded as significant. Sufficient evidence of discriminant validity of the construct was thus provided. The Cronbach's alpha co-efficient of 0.78 for *support services* suggests that the instrument used to measure this construct was reliable.

Table 6.4: Sub model A - Factor structure — Support services

Eigenvalue: 1.04 % of Variance: 6.10		Cronbach's alpha: 0.78		
Item	**Question**	**Factor loading**	**Item-total correlation**	**Cronbach's alpha if item deleted**
SS4	Our organisation makes use of community based support service providers such as NGOs and NPOs.	0.947	0.635	
SS5	Our organisation makes use of support service providers to assess the impact of community development projects. objectively	0.638	0.635	

Loadings in red represent significant loadings (p≥0.4)

Despite the inclusion of only 2 of the items loading on to the factor: *support services* the operationalisation of *support services*, as described in Chapter 5, remains unchanged. For the purposes of this study, *support services* refers to the level of assistance to renewable energy companies that will allow them to improve their management of revenue for beneficiary communities, which goes beyond the capabilities of the company and its immediate service providers, thus including specialists in economic development, training, project and stakeholder management to achieve successful socio-economic growth in the communities.

6.4.1.4 Factor 4: Outside Advice

A total of 3 of the 5 items expected to measure the construct: *outside advice* loaded together on one factor. *Outside advice* explained 5.15% of the variance in the data and an Eigenvalue of 0.88 was reported in Table 6.5. All factor loadings exceeded 0.4 and were thus regarded as significant. Sufficient evidence of discriminant validity of the construct was thus provided. The Cronbach's alpha co-efficient of 0.66 for *outside advice* suggests that the instrument used to measure this construct was reliable.

Table 6.5: Sub model A - Factor structure — Outside advice				
Eigenvalue: 0.88 % of Variance: 5.15		**Cronbach's alpha: 0.66**		
Item	**Question**	**Factor loading**	**Item-total correlation**	**Cronbach's alpha if item deleted**
OA2	Outside advisers can give our organisation a different perspective on beneficiary communities	0.693	0.485	0.546
OA3	Our organisation makes use of various outside experts for our community development projects.	0.457	0.475	0.552
OA5	Our organisation believes that there is value in spending money on outside advisors	0.430	0.459	0.588
Loadings in red represent significant loadings (p≥0.4)				

With the inclusion of only 3 out of 5 of the items loading on to the factor: outside advice, the operationalisation of *outside advice*, as described in Chapter 5, remains unchanged. For the purpose of this study, *outside advice* refers to specialist consultants who provide advice in the field of renewable energy and revenue management who have insight into the process of revenue management and ensure sustainable and transformational socio-economic development in the beneficiary communities.

6.4.1.5 Factor 5: Effective Financial Management

Only 2 of the 5 items expected to measure the construct: *financial management* loaded together on one factor. *Financial management* explained 4.54% of the variance in the data and an Eigenvalue of 0.77 was reported in Table 6.6. All factor loadings exceeded 0.4 and were thus regarded as significant. Sufficient evidence of discriminant validity of the construct was thus provided. The Cronbach's alpha co-efficient of 0.78 for *financial management* suggests that the instrument used to measure this construct was reliable.

Table 6.6: Sub model A - Factor structure — Financial management				
Eigenvalue: 0.88 % of Variance: 4.54		**Cronbach's alpha: 0.78**		
Item	**Question**	**Factor loading**	**Item-total correlation**	**Cronbach's alpha if item deleted**
FM1	Sound financial management is important for successful community development.	0.738	0.643	
FM2	Effective strategic financial management is important for successful community development projects	0.696	0.643	
Loadings in red represent significant loadings (p≥0.4)				

Despite the inclusion of only 2 of the 5 items loading on to the factor: *financial management*, the operationalisation of *financial management*, as described in Chapter 5, remains important. For the purpose of this study, *financial management* refers to the financial systems and processes employed to ensure sound financial management in an RE company which includes the management of revenue for beneficiary communities.

6.4.2 Sub-model B: Transformational Change

For Sub-model B, labelled *Transformational change*, the Principal Axis Factoring estimation method with an Oblique Rotation (Oblimin with Kaiser normalisation) was used as the extraction and rotation method. Bartlett's Test of Sphericity returned a

KMO value of 0.93 (p<0.00) indicating that the data were factor-analysable. In sub-model B, items expected to measure the factors education, infrastructure development, human development and good governance were assessed for discriminant validity by means of an exploratory factor analysis.

Initially the number of factors to be extracted was not specified, but the Eigenvalues suggested a total of 3 factors to be used as the independent variables. The final solution was reached through an iterative process of deleting items that did not demonstrate sufficient discriminant validity, and re-running the exploratory factor analysis until all the remaining items loaded to a significant extent (p > 0.4) with no cross-loadings (i.e. loaded on only one factor). The most interpretable factor structure is presented in Table 6.7. All items with loadings <0.4 were deleted. The independent variables were firstly analysed and the following results were obtained:

Table 6.7: Rotated factor loadings: Sub-model B

	Factor 1	Factor 2	Factor 3
	Developmental benefits	Human development	Good governance
ED5	0.822	-0.032	-0.009
ID5	0.813	0.020	-0.212
ED3	0.768	0.051	0.054
ID4	0.746	0.025	0.106
ED4	0.709	0.041	0.136
ID2	0.673	0.024	0.184
ED2	0.602	-0038	0.194
ID3	0.551	0.009	0.276
ID1	0.533	0.011	0.233
ED1	0.462	0.011	0.289
HD4	-0.097	0.895	0.004
HD3	0.025	0.853	-0.084
HD2	-0.041	0.744	0.033
HD1	0.168	0.678	-0.131
HD5	-0.038	0.528	0.143
GG3	0.162	-0.009	0.732
GG1	-0.009	0.012	0.702
GG4	0.205	0.05	0.658

GG2	0.227	0.061	0.616
GG5	0.377	0.090	0.413
Eigenvalue:	9.001	2.919	1.128
Rotation converged in 14 iterations			
Loadings in red represent significant loadings (p≥0.4)			

Table 6.7 indicates that a total of 20 items (3 independent variables and 1 intervening variable) were grouped into three factors and explained 65.24% of the variance in the data. The next step was to analyse the intervening variables. The same procedure as that used for the factor analysis of the intervening variable was followed.

6.4.2.1 Factor 1 – Developmental Benefits

All 5 items expected to measure the construct: *education* loaded together with all 5 items expected to measure the construct: *infrastructure development* on the same factor. This construct was consequently renamed *developmental benefits* and redefined based on the results of the factor analysis.

Developmental benefits explained 45.01% of the variance in the data and an Eigenvalue of 9.00 was reported in Table 6.8. All factor loadings exceeded 0.4 and were thus regarded as significant. Sufficient evidence of discriminant validity of the construct was thus provided. The Cronbach's alpha co-efficient of 0.93 for *developmental benefits* suggests that the instrument used to measure this construct was reliable.

Table 6.8: Sub model B - Factor structure — Developmental benefits				
Eigenvalue: 9.00 % of Variance: 45.01		**Cronbach's alpha: 0.93**		
Item	**Question**	**Factor loading**	**Item-total correlation**	**Cronbach's alpha if item deleted**
ED5	Education can give people in beneficiary communities' better access to the formal economy	0.822	0.766	0.920

ID5	Infrastructure development can significantly reduce levels of poverty in beneficiary communities.	0.813	0.625	0.930
ED3	Education can improve the lifestyle choices of people in beneficiary communities.	0.768	0.780	0.919
ID4	Infrastructure development improves the quality of life of beneficiary communities.	0.746	0.798	0.919
ED4	Education can improve the quality of life of people in beneficiary communities	0.709	0.784	0.919
ID2	Infrastructure development has long-term economic benefits for beneficiary communities	0.673	0.776	0.920
ED2	Education increases the employability of people in beneficiary communities	0.602	0.711	0.923
ID3	Infrastructure development can ensure better service delivery in beneficiary communities	0.551	0.725	0.922
ID1	Infrastructure development can accelerate economic growth in beneficiary communities.	0.533	0.682	0.925
ED1	Improving the education for people in beneficiary communities can have a positive impact on their communities	0.462	0.650	0.926
Loadings in red represent significant loadings (p≥0.4)				

For the purpose of this study, *developmental benefits* are operationally defined as the benefits that the beneficiary community can derive from formal and informal education; training in the form of learnerships; mentorships; further education and training, educational support and resourcing. Benefits also include the development of physical systems such as buildings, transportation, communication, sewage, water and electricity that will improve their socio-economic circumstances.

6.4.2.2 Factor 2 – Human Development

All 5 items expected to measure the construct: *human development* loaded together on one factor. *Human development* explained 14.60% of the variance in the data and an Eigenvalue of 2.92 was reported in Table 6.9. All factor loadings exceeded 0.4 and were thus regarded as significant. Sufficient evidence of discriminant validity of the construct was thus provided. The Cronbach's alpha co-efficient of 0.856 for *human development* suggests that the instrument used to measure this construct was reliable.

Table 6.9: Sub model B - Factor structure — Human development				
Eigenvalue: 2.92 % of Variance: 14.60		Cronbach's alpha: 0.86		
Item	Question	Factor loading	Item-total correlation	Cronbach's alpha if item deleted
HD4	Most people in beneficiary communities have the capability to improve their own living circumstances.	0.895	0.782	0.794
HD3	People in beneficiary communities have the capability to satisfy their own human needs.	0.853	0.766	0.799
HD2	People in beneficiary communities are capable of developing their own resources.	0.744	0.676	0.824
HD1	Most people in beneficiary communities have the capability to improve their own living circumstances.	0.678	0.634	0.835
HD5	People in beneficiary communities generally know what they need to survive	0.528	0.498	0.867
Loadings in red represent significant loadings (p≥0.4)				

The operationalisation of *human development*, as described in chapter 5, remains unchanged. For the purpose of this study, *human development* refers to the increase of both capabilities and opportunities that will ensure successful management of revenue for beneficiary communities; to improve the quality of life and life expectancy of community members in beneficiary communities; to contribute to the formation of human capabilities, such as improved health, knowledge and skills, and the use people make of their acquired capabilities for leisure, productive purposes or being active in cultural, social and political affairs in beneficiary communities.

6.4.2.3 Factor 3: Good Governance

All 5 items expected to measure the construct: *good governance* loaded together on one factor as expected. *Good governance* explained 5.64% of the variance in the data and an Eigenvalue of 1.13 was reported in Table 6.10. All factor loadings exceeded 0.4 and were thus regarded as significant. Sufficient evidence of discriminant validity of the construct was thus provided. The Cronbach's alpha co-efficient of 0.88 for *good governance* suggests that the instrument used to measure this construct was reliable.

Table 6.10: Sub model B - Factor structure — Good governance				
Eigenvalue: 1.13 % of Variance: 5.64		Cronbach's alpha: 0.88		
Item	**Question**	**Factor loading**	**Item-total correlation**	**Cronbach's alpha if item deleted**
GG3	Good governance can help to build trust between our organisation and the beneficiary communities	0.732	0.791	0.836
GG1	Our organisation believes in the value of good governance in all our activities.	0.702	0.617	0.877
GG4	Good governance ensures that our organisation acts with integrity when involved in community development projects.	0.658	0.754	0.847
GG2	Good governance improves relationships between our organisation and the beneficiary communities	0.616	0.753	0.846
GG5	Good corporate governance is essential to effective infrastructure development in beneficiary communities.	0.413	0.667	0.866
Loadings in red represent significant loadings (p≥0.4)				

The operationalisation of *good governance*, as described in Chapter 5, remains unchanged. For the purposes of this study, *good governance* refers to the influence of good governance practices and their relationship with the identified variables and the perceived success of managing revenue for beneficiary communities in RSA that includes *good governance* infrastructure, processes, policies, systems and procedures.

6.4.3 Sub-model C: Sustainable Initiatives

For Sub-model C, labelled *Sustainable initiatives*, the Principal Axis Factoring estimation method with an Oblique Rotation (Oblimin with Kaiser Normalisation) was used as the extraction and rotation method. Bartlett's Test of Sphericity returned a KMO value of 0.94 ($p<0.00$) indicating that the data were factor-analysable. In Sub-model C, items expected to measure the factors project management, strategic planning, financial management and good governance were assessed for discriminant validity by means of an exploratory factor analysis. Initially the number of factors to be extracted was not specified, but the Eigenvalues suggested a total of 4 factors to be used as the independent variables. The final solution was reached through an iterative process of deleting items that did not demonstrate sufficient discriminant validity, and re-running the exploratory factor analysis until all the remaining items loaded to a significant extent ($p > 0.4$) with no cross-loadings (i.e. loaded on only one factor). The most interpretable factor structure is presented in Table 6.11. All items with loadings < 0.4 were deleted. The independent variables were firstly analysed and the following results were obtained:

Table 6.11: Rotated factor loadings: Sub-model C

	Factor 1	Factor 2	Factor 3	FACTOR 4
	Project management	Strategic planning	Financial management	Good governance
PM1	0.915	0.150	0.122	0.007
PM2	0.886	-0.057	0.095	0.118
PM3	0.752	-0.047	0.076	0.170
PM5	0.750	-0.202	0.024	0.029
PM4	0.652	-0.076	0.123	0.169
FM4	0.519	-0.196	0.072	0.249
GG5	0.486	-0.224	0.023	0.170
SPL1	-0.131	0.787	0.334	0.006
SPL2	0.141	0.777	0.064	0.044
SPL3	0.075	0.777	0.137	0.156
SPL4	0.057	0.760	0.070	0.123
SPL5	0.299	0.694	0.013	0.055
FM1	0.177	-0.156	0.621	0.233
FM2	0.307	0.174	0.569	0.144
GG1	0.002	0.105	0.230	0.861
GG2	0.162	0.261	0.164	0.614
GG3	0.165	0.300	0.098	0.592
Eigenvalue:	10.093	0.972	0.908	0.716

Rotation converged in 13 iterations

Loadings in red represent significant loadings (p≥0.4)

Table 6.11 indicates that a total of 17 items (3 independent variables and 1 intervening variable), were grouped into 4 factors and explained 74.64% of the variance in the data. The next step was to analyse the intervening variables. The same procedure as that used for the factor analysis of the intervening variable was followed.

6.4.3.1 Factor 1 – Effective Project Management

All 5 items expected to measure the construct: *project management* loaded together on one factor. *Project management* explained 59.37% of the variance in the data and an Eigenvalue of 10.09 was reported in Table 6.12. Two items expected to measure the factors, financial management and good governance, also loaded on the factor *project management*. All factor loadings exceeded 0.4 and were thus regarded as significant. Sufficient evidence of discriminant validity of the construct was thus provided. The Cronbach's alpha co-efficient of 0.93 for *project management* suggests that the instrument used to measure this construct was reliable.

Table 6.12: Factor structure – Sub model C – Project management

Eigenvalue: 10.09 % of Variance: 59.37		Cronbach's alpha: 0.93		
Item	**Question**	**Factor loading**	**Item-total correlation**	**Cronbach's alpha if item deleted**
PM1	Project management is a key component of managing revenue for beneficiary communities.	0.915	0.753	0.917
PM2	Project management skills can improve management of revenue for beneficiary communities	0.886	0.793	0.913
PM3	Effective project management when dealing with beneficiary communities is valuable.	0.752	0.822	0.910
PM5	Effective project management ensures that community development projects meet quality standards.	0.750	0.813	0.911
PM4	Effective project management reduces risks to the organisation when involved in community development projects.	0.652	0.706	0.922

FM4	Effective strategic financial management improves good governance for community development projects.	0.519	0.788	0.913
GG5	Good corporate governance is essential to effective infrastructure development in beneficiary communities.	0.486	0.705	0.921
Loadings in red represent significant loadings (p≥0.4)				

Despite the inclusion of 2 of the items loading on to the factor: *project management*, the operationalisation of *project management*, as described in Chapter 5, remains unchanged. For the purpose of this study, *project management* refers to all the processes employed by an RE company that involves achieving SED and ED project objectives (schedule, budget and performance), through a set of activities that start and end at certain points in time and produce quantifiable and qualified deliverables for successful management of revenue for beneficiary communities in the short-, medium- and long-term.

6.4.3.2 Factor 2 – Strategic Planning

All five items expected to measure the construct: *strategic planning* loaded together on one factor. *Strategic planning* explained 5.72% of the variance in the data and an Eigenvalue of 0.97 was reported in Table 6.13. All factor loadings exceeded 0.4 and were thus regarded as significant. Sufficient evidence of discriminant validity of the construct was thus provided. The Cronbach's alpha co-efficient of 0.91 for *strategic planning* suggests that the instrument used to measure this construct was reliable.

Table 6.13: Sub model C - Factor structure - Strategic planning				
Eigenvalue: 0.97 % of Variance: 5.72		**Cronbach's alpha: 0.91**		
Item	**Question**	**Factor loading**	**Item-total correlation**	**Cronbach's alpha if item deleted**
SPL1	Formal strategic planning can promote effective management of revenue for beneficiary communities.	0.787	0.666	0.904
SPL2	Formal strategic planning increases the chances of successful community	0.777	0.790	0.879

	development projects.			
SPL3	Formal strategic planning can maximise the use of available resources within our organisation.	0.777	0.821	0.872
SPL4	Formal strategic planning will give our organisation a clear direction on how to manage community development projects better.	0.760	0.754	0.887
SPL5	Formal strategic planning improves community development in beneficiary communities	0.694	0.791	0.878
Loadings in red represent significant loadings (p≥0.4)				

The operationalisation of *strategic planning*, as described in Chapter 5, remains unchanged. For the purpose of this study, strategic planning refers to the formulation of achievable policy objectives for future growth and development of an organization over a period of years, based on its mission and goals and on a realistic assessment of the available resources, human and material, to implement the plan that will lead to the success managing revenue for beneficiary communities. *Strategic planning* enables the company to incorporate a long-term Socio-economic and Enterprise Development (SED and ED) initiatives that will have both a socio-economic and transformational outcome for the beneficiary communities.

6.4.3.3 Factor 3 – Effective Financial Management

All 5 items expected to measure the construct: *financial management* loaded together on one factor. *Financial management* explained 5.34% of the variance in the data and an Eigenvalue of 0.91 was reported in Table 6.14. All factor loadings exceeded 0.4 and were thus regarded as significant. Sufficient evidence of discriminant validity of the construct was thus provided. The Cronbach's alpha co-efficient of 0.78 for *financial management* suggests that the instrument used to measure this construct was reliable.

Table 6.14: Sub model C - Factor structure – Financial management				
Eigenvalue: 0.91 **% of Variance: 5.34**		**Cronbach's alpha: 0.78**		
Item	**Question**	**Factor**	**Item-total**	**Cronbach's**

		loading	correlation	alpha if item deleted
FM1	Sound financial management is important for successful community development	0.621	0.643	-
FM2	Effective strategic financial management is important for successful community development projects.	0.569	0.643	-
Loadings in red represent significant loadings (p≥0.4)				

The operationalisation of financial management, as described in Chapter 5, remains unchanged. For the purpose of the study, financial management refers to the financial systems and processes employed to ensure sound and effective financial management in an RE company which includes the management of revenue for beneficiary communities.

6.4.3.4 Factor 4 - Good Governance

A total of 3 of the 5 items expected to measure the construct: ***good governance*** loaded together on one factor. *Good governance* explained 4.21% of the variance in the data and an Eigenvalue of 0.72 was reported in Table 6.15. All factor loadings exceeded 0.4 and were thus regarded as significant. Sufficient evidence of discriminant validity of the construct was thus provided. The Cronbach's alpha co-efficient of 0.82 for *good governance* suggests that the instrument used to measure this construct was reliable.

Table 6.15: Sub model C - Factor structure – Good governance				
Eigenvalue: 0.72 **% of Variance: 4.21**		**Cronbach's alpha: 0.82**		
Item	**Question**	**Factor loading**	**Item-total correlation**	**Cronbach's alpha if item deleted**
GG1	Our organisation believes in the value of good governance in all our activities	0.861	0.585	0.845
GG2	Good governance improves relationships between our organisation and the beneficiary communities	0.614	0726	0.709
GG3	Good governance can help to build trust between our organisation and the beneficiary communities	0.592	0.734	0.699
Loadings in red represent significant loadings (p≥0.4)				

The operationalisation of *good governance*, as described in Chapter 5, remains unchanged. For the purposes of this study, *good governance* refers to the influence of good governance practices and their relationship with the identified variables (improvement, value and trust) and the perceived success of managing revenue for beneficiary communities in RSA which includes *good governance* infrastructure, processes, policies, systems and procedures.

6.5 Latent Variables Removed from the Proposed Theoretical Model

Figure 4.1 presented a proposed theoretical model derived from the literature reviewed. Two latent variables were removed from the model after the assessment of the discriminant validity and reliability of the items used to measure the various constructs in the model. Some items from the deleted variables, however, did load on other factors in the exploratory factor analysis. The following variables from the proposed theoretical model were altered as shown in Table 6.16.

Table 6.16: Proposed theoretical model

Proposed independent variables	**Rename independent variables**
Outside advice	Distinctive benefits
Support services	
Education	Developmental benefits
Infrastructure	

6.6 Reformulation of the Hypothesis

Two variables, namely, *outside advice* and *support services*, however, did load together to form a factor labelled: *distinctive benefits* and the two variables, namely, *education* and *infrastructure development* loaded together to form a factor labelled: *developmental benefits*. The independent variables: ***change management*** and *strategic partnerships* were removed from the proposed theoretical model because their discriminant validity could not be confirmed by the exploratory factor analysis.

The following are the new hypotheses that are discussed in the remainder of this study:

Table 6.17: Hypotheses	
Sub-model A – Multi-sector participation	
H_1	There is a positive relationship between distinctive benefits and the perceived success of managing revenue.
H_2	There is a positive relationship between the implementation of outside advice measures and the perceived success of managing revenue.
H_3	There is a positive relationship between support services and the perceived success of managing revenue.
H_4	There is a positive relationship between the importance of financial management and the perceived success of revenue management
H_5	There is a positive relationship between the use of good governance and the perceived success of managing revenue.
H_{5a}	There is a positive relationship between distinctive benefits and good governance.
H_{5b}	There is a positive relationship between the implementation of outside advice and good governance.
H_{5c}	There is a positive relationship between support services and good governance.
H_{5d}	There is a positive relationship between financial management and good governance.
Sub-model B – Transformational change	
H_6	There is a positive relationship between developmental benefits and the perceived success of managing revenue.
H_7	There is a positive relationship between human development and the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa.
H_8	There is a positive relationship between good governance and the perceived success of managing revenue.
H_{8a}	There is a positive relationship between developmental benefits and good governance.
H_{8b}	There is a positive relationship between human development and good governance.
Sub-model c – Sustainable initiatives	

H_9	There is a positive relationship between project management methodologies and the perceived success of managing revenue.
H_{10}	There is a positive relationship between the extent of strategic planning and the perceived success of managing revenue.
H_{11}	There is a positive relationship between the implementation of financial management measures and the perceived success of managing revenue.
H_{12}	There is a positive relationship between good governance and the perceived success of managing revenue.
H_{12a}	There is a positive relationship between project management methodologies and good governance.
H_{12b}	There is a positive relationship between the extent of strategic planning and good governance.
H_{12c}	There is a positive relationship between the implementation of financial management measures and good governance.

After the reliability and discriminant validity of all the variables remaining in the empirical model had been confirmed, the statistical technique, Structural Equation Modelling (SEM), was used to test the series of relationships of the revised version of model shown in Figure 6.1 below. The results of the above hypotheses are discussed in the remainder of this chapter.

6.7 Empirical Results and Interpretations of the Structural Equation Modelling Analysis

In Chapter 4, the first step of the structural equation modelling analysis was completed which was to develop a model that was theoretically justified based on the literature reviews. This step also included the revision of the model through an exploratory factor analysis (Section 6.6). The remaining six steps to be discussed in this chapter are as follows (Hair *et al.*, 2010):

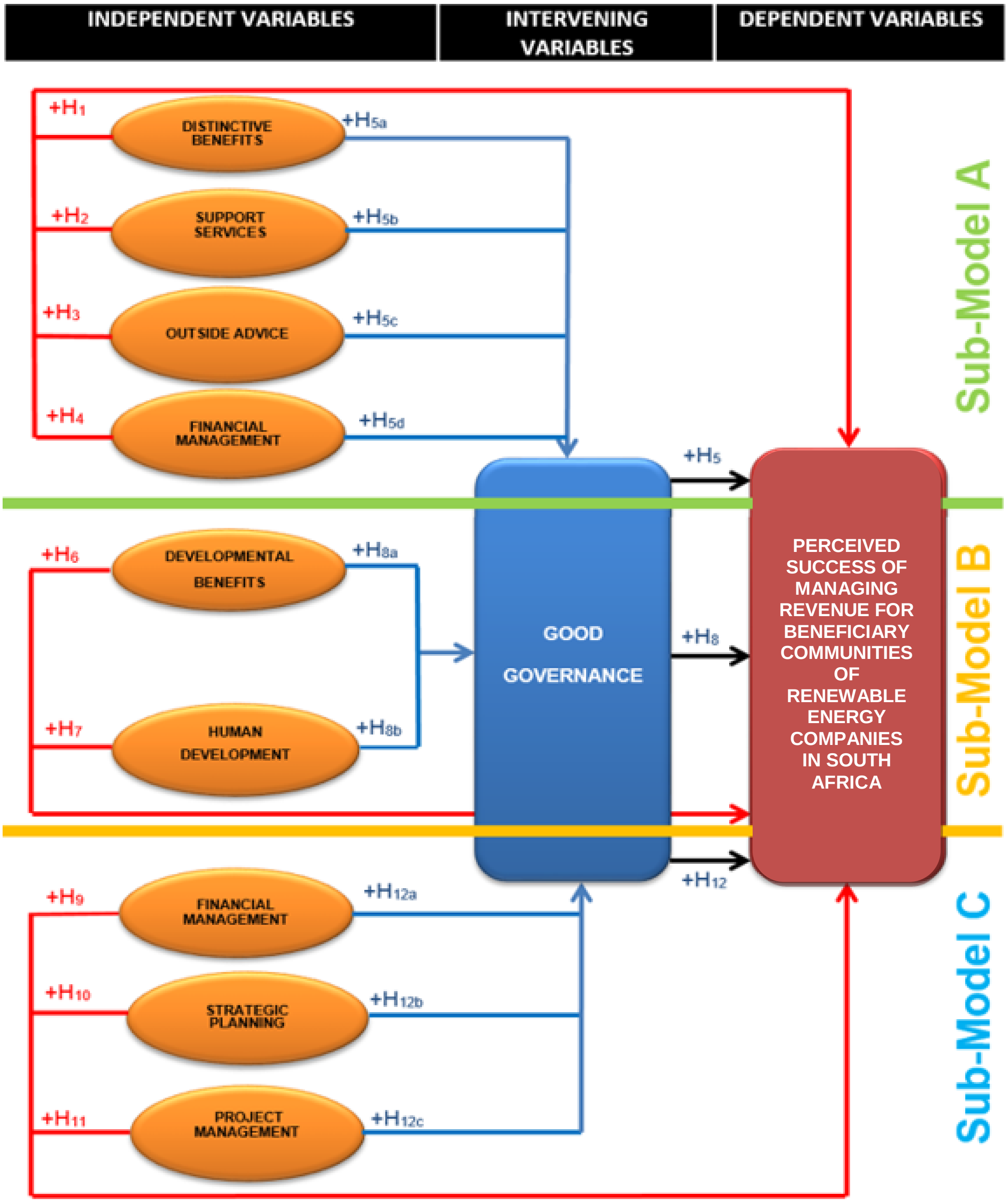
2) Constructing the path diagram of causal relationships
3) Converting the path diagram measurement models into structural and measurement models
4) Choosing the input matrix type and estimating the proposed model
5) Assessing the identification of the structural model

6) Evaluating the goodness-of-fit results
7) Making theoretically justified modifications to the model.

6.8 Step 2: Construct the Path Diagram of Causal Relationships

The second step was to illustrate the relationships between the constructs in a path diagram. A path diagram is a visual representation of a model and the complete set of relationships among the model's constructs (Hair *et al.*, 2010). Each theoretically proposed relationship is defined by a hypothesis as shown in Figures 6.1 below..

Figure 6.1: Path diagram of causal relationships: Revised theoretical model



Source: Researcher's own construction

Various methods were used to make the path diagram in Figure 6.1 easier to read. All the independent variables are depicted as orange oval shapes, the intervening variable as a blue rectangular shape, and the dependent variables as a red rectangular shape. The single-headed arrows indicate the dependence relationships. Red arrows indicate the relationship between the independent variable and the dependent variable, and blue arrows indicate the relationship between the independent variable and the intervening variable. The black arrows indicate the relationship between the intervening variable and the dependent variable. The constructs with no arrows pointing to them, are called the exogenous variables (independent variables) and are not caused by any other variable in the model. The constructs with arrows pointing to them, are called endogenous variables (dependent variables). Endogenous constructs can predict other endogenous constructs, but an exogenous construct can only be causally related to endogenous constructs. Outside advice is an example of an exogenous variable in the path diagram as it is causally related to the endogenous variable *Perceived success of managing revenue*.

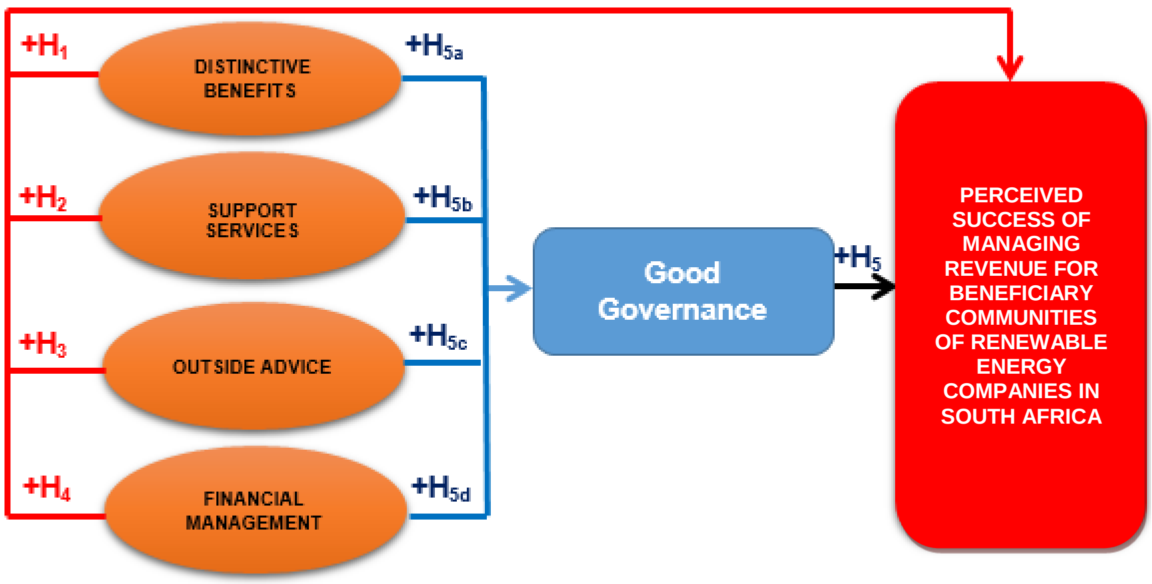
Based on the ratio of “sample size to number of indicators” recommended (see Section 5.1), the sample size (219) of the present study was too small to test the model in its entirety. Hair et al. (2006: 741) suggest that simpler models can be tested with smaller samples. Consequently, it was decided to split the original model of factors influencing the *perceived success of managing revenue* into three sub-models to subject each one to SEM individually. The three sub-models were: Sub-model A (Multi-sector participation), Sub-model B (Transformational change) and Sub-model C (Sustainable initiatives). Each sub-model was factor analysed individually by means of SPSS 23 and, therefore, separate path diagrams were constructed. Hair *et al.* (2010) state that the desire to include all variables, however, must be balanced against the practical limitations of SEM.

The first sub-model was constructed using a path diagram to represent the causal relationships between the antecedent variables of *distinctive benefits*, *outside advice*, *support services, financial management* and the intervening variable of *good governance* and the dependent variable of *perceived success of managing revenue* (Figure 6.2).

The second sub-model was constructed using a separate path diagram to depict the causal relationships between the antecedent variables of *developmental benefits* and *human development* and the intervening variable of *good governance* and the dependent variable of *perceived success of managing revenue* (Figure 6.3).

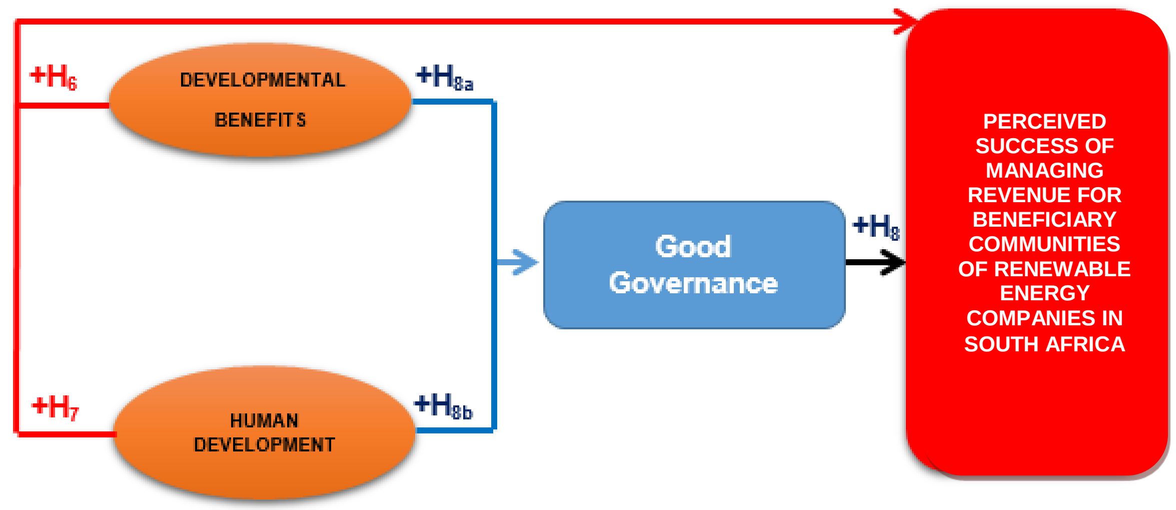
The third sub-model was also constructed using a separate path diagram and illustrated the causal relationships between the antecedent variables of *financial management*, *strategic planning* and *project management* and the intervening variable of *good governance* and the dependent variable **of** *perceived success of managing revenue* (Figure 6.4).

Figure 6.2: Path diagram of causal relationships: Revised theoretical model (Sub-model A)



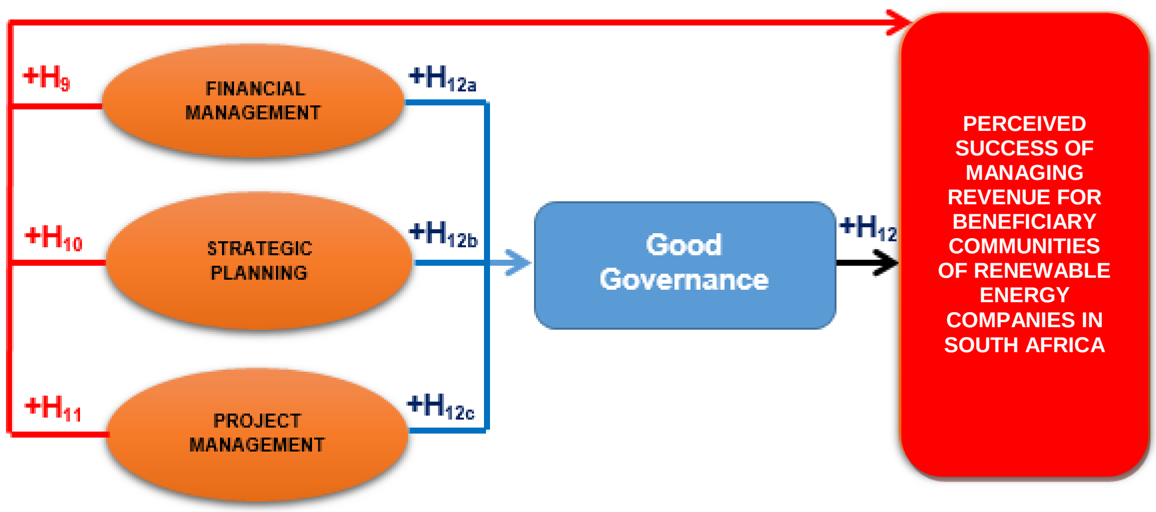
Source: Researcher's own construction

Figure 6.3: Path diagram of causal relationships: Revised theoretical model (Sub-model B)



Source: Researcher's own construction

Figure 6.4: Path diagram of causal relationships: Revised theoretical model (Sub-model C)



Source: Researcher's own construction

In the present study, each of the three sub-models identified above was subjected to empirical assessment using SEM. The software programme, LISREL 8.8 (Jöreskog & Sörbom 2006) was used for this purpose. The various steps involved in performing SEM were described in Section 5.15.3 and their application in the present study is discussed below.

6.9 Step3: Converting the Path Diagram into Measurement and Structural Models

The third step involves the development of the path diagram of causal relationships in the revised theoretical model shown in Figure 6.1 through a series of structural equations linking constructs of the measurement model, The model had to be specified in more prescribed terms by indicating which item measured which construct. Relationships in the path diagram had to be converted into structural equations. For each equation, a structural co-efficient (b) was estimated and an error term (E) was included to provide for the sum of the effects of specification and random selection errors. An example of a structural equation is provided below for the endogenous construct, *perceived success of managing revenue.*

$$\text{PERCEIVED SUCCESS OF MANAGING REVENUE} = b_1 * \text{DEVELOPMENTAL BENEFITS} + B_2 * \text{HUMAN DEVELOPMENT} + E_1$$

Table 6.18 below is a summary of all the endogenous and exogenous variables (structural equations used as inputs for the LISREL programme).

Table 6.18: The measurement and structural model	
MEASUREMENT MODEL: SUB-MODEL A	
ANTECEDENT VARIABLES	**MANIFEST VARIABLES**
DISTINCTIVE BENEFITS	OA1, OA3, SS1
SUPPORT SERVICES	SS4, SS5
OUTSIDE ADVICE	OA2, OA3, OA5
FINANCIAL MANAGEMENT	FM1, FM2
INTERVENING VARIABLE	**MANIFEST VARIABLES**
GOOD GOVERNANCE	GG3, FM5, GG2, GG4, GG5, FM3, GG1
MEASUREMENT MODEL: SUB-MODEL B	
ANTECEDENT VARIABLES	**MANIFEST VARIABLES**
DEVELOPMENTAL BENEFITS	ED5, ID5, ED3, ID4, ED4, ID2, ED2, ID3, ID1, ED1
HUMAN DEVELOPMENT	HD4, HD3, HD2, HD1, HD5
INTERVENING VARIABLE	**MANIFEST VARIABLES**
GOOD GOVERNANCE	GG1, GG2, GG3, GG4, GG5
MEASUREMENT MODEL: SUB-MODEL C	
ANTECEDENT VARIABLES	**MANIFEST VARIABLES**
PROJECT MANAGEMENT	PM1, PM2, PM3, PM5, PM4, FM4, GG5
STRATEGIC PLANNING	SPL1, SPL2, SPL3, SPL4, SPL5
FINANCIAL MANAGEMENT	FM1, FM2
GOOD GOVERNANCE	GG1, GG2, GG3
DEPENDENT VARIABLE	**MANIFEST VARIABLES**
PERCEIVED SUCCESS OF MANAGING REVENUE	RM1, RM2, RM3, RM4, RM5
STRUCTURAL MODEL	
DEPENDENT VARIABLE	**INDEPENDENT VARIABLES**
PERCEIVED SUCCESS OF MANAGING REVENUE	**SUB-MODEL A:** • DISTINCTIVE BENEFITS (DB) • SUPPORT SERVICES (SS) • OUTSIDE ADVICE (OA) • FINANCIAL MANAGEMENT (FM)
PERCEIVED SUCCESS OF MANAGING REVENUE	**SUB-MODEL B:** • DEVELOPMENTAL BENEFITS (DVB) • HUMAN DEVELOPMENT (HD)
PERCEIVED SUCCESS OF MANAGING REVENUE	**SUB-MODEL C:** • PROJECT MANAGEMENT (PM) • STRATEGIC PLANNING (SPL) • FINANCIAL MANAGEMENT
Source: Researcher's own construct	

Hair *et al.*(2010) indicate that the transition from factor analysis, where there is no control over which variable defines a factor, must be made to a more confirmatory mode in which variables define each construct factor, as specified by the analyst, when developing the specifications for the structural model. To indicate and measure the latent constructs, the manifest variables (questionnaire items) in the structural model are used (Hair *et al.*, 2010). These manifest variables are collected from the respondents by completing a questionnaire and are termed “indicators” in the measurement model, as they are used to measure or “indicate” the latent constructs (factors), (Hair *et al.*, 2010:118).

To confirm the reliability of all the indicators, an empirical estimation approach is used, which specifies the loading matrix along with an error term for every indicator (variable). During the measurement model estimation process, the loading co-efficients provide an estimation of the reliability of the indicators and the over-all construct (Hair *et al.*, 2010). In this approach, researchers have no effect on the reliability value of the estimation process, except through the inclusion of the set of indicators (Hair *et al.*, 2010).

The specification of the measurement model is similar to an exploratory factor analysis but differs in that the number of factors and the items loading onto each factor must be known and specified before the analysis can be conducted (Garson, 2006; Hair *et al.*, 2010). As can be seen from Figure 6.5 on pg. 233, the measurement model specifies the rules of correspondence between measured and latent variables (Hair *et al.*, 2010). The measurement model can be represented by a series of regression-like equations mathematically relating a factor to the measurement variables (Hair *et al.*, 2010). All the specifications of the structural model are identified in Table 6.15 on pg. 221, and consist of ten constructs, identified during the exploratory factor analysis.

6.10 STEP 4: The Input Matrix and Model Estimation

The fourth step in structural equation modelling involves selecting the input matrix type and estimating the proposed model. The co-variance matrix is then used as the input data. The focus of structural equation analysis is not on individual observations, but on the pattern of relationships across respondents (Hair *et al.*, 2010). The measurement model then specifies which manifest variables (indicators) correspond with each latent construct. Structural co-efficients are then estimated for the relationships between the latent variables (Hair *et al.*, 2010). Version 8.54 of the LISREL (Linear Structural Relations) programme (Jöreskog & Sörbom, 2003) was used for the structural equation modelling assessment.

The data in the present study shows evidence of non-normality, therefore, as opposed to the more commonly used Maximum Likelihood method for estimating the parameters in SEM, an alternative analytical procedure is used, namely, Robust Maximum Likelihood. Robust Maximum Likelihood compensates for non-normality of the data (Hoogland & Boomsma 1998; Satorra & Bentler 1994).

6.10.1 Assessment of the Multivariate Normality of the Data

Before the SEM analysis was conducted, an assessment of the multivariate normality of the data was conducted. The following hypotheses were formulated for this purpose:

H^0: The data are normally distributed.

H^a: The data are not normally distributed.

The null hypothesis and the alternative hypothesis, as formulated above, were evaluated by assessing the skewness and the kurtosis of the data, while the Chi-square ($\chi 2$) value was used to determine the relevant p-value. The results of the test for multivariate normality of the relationship between the independent and intervening variables were as follows:

- Chi-square – 5694.208
- p- value – <0.00

Based on the Chi-square it was concluded that the data were not multivariate normally distributed. Therefore, use was made of the Robust Maximum Likelihood (Satorra-Bentler) method of estimation for all the subsequent SEM analyses.

The results of the test for multivariate normality of the relationship between the independent and dependent variables were as follows:

- Chi-square – 4396.454
- p- value – <0.00

Based on the Chi-square statistics, it was concluded that the data were not multivariate normally distributed. Therefore, use was made of the Robust Maximum Likelihood (Satorra-Bentler) method of estimation for all the subsequent SEM analyses.

The one-tailed test was used to assess the statistical significance because one directional (or one-tailed) hypotheses were proposed in this study. The one-tailed test uses only one tail of an underlying distribution of values to determine significance. Therefore, it is noted that if:

t – value ≥1.282 but less than 1.64, it is significant at the 10% level. (0.1)
t – value ≥1.64 but less than 2.330, it is significant at the 5% level. (0.05)
t – value ≥2.330 but less than 3.090, it is significant at the 1% level. (0.01)
t – value >3.090 it is significant at the 0.1% level. (0.001)

6.10.2 Assessing the Measurement Model

The measurement model represents how successfully measured variables (the manifest variables) represent the latent constructs, and how well the structural model shows how constructs are associated with one another. The specification of the measurement model, which indicates which variables measure which constructs in the structural model, precedes the structural equation model (Mulaik, 2009).

6.10.1.1 Fit Indices for the Measurement Model

To establish the degree to which the proposed models represent an acceptable approximation of the data, various fit indices were considered for each of the 3 sub-models. Tables 6.17, 6.18 and 6.19 indicate the fit indices for the three measurement modes assessed in this study.

Table 6.19: Criteria for goodness-of-fit indices

CRITERIA FOR GOODNESS-OF-FIT INDICES		
Goodness-of-fit measure	**Values**	**Indicators (Reference)**
χ2 /degrees of freedom	<2	Good fit (Politis, 2003; Ullman, 1996)
Root mean square error of approximation (RMSEA)	<0.05	Good fit
	<0.06	Close fit (Hu & Bentler, 1999)
	0.05 – 0.08	Acceptable or reasonable fit (Grimm & Yarnold, 2000; Baumgartner & Homburg, 1996; Hair, 2010)
	>0.08	Poor fit (MacCullum, Browne & Sugawara, 1996)
	0.10<	Acceptable models (Hair, 2010)
90% confidence interval for RMSEA	<0.08	Upper limit of confidence level / good fit (Roberts, Stephen & Ilardi, 2003)
	>0.08 – 0.10	Poor fit (MacCullum, Browne & Sugawara, 1996)

- **Sub-model A (Multi-sector participation)**

Table 6.20 below shows the fit indices for Sub-model A which assesses the relationship between the 4 independent variables (*distinctive benefits, outside advice, support services* and *financial management*) and *good governance*.

Table 6.20: Fit indices for the measurement model (Sub-model A)

(Relationship between the independent variables and good governance (intervening variable)	
Sample size	219
Degrees of Freedom	215
Satorra-Bentler Scaled Chi-Square	361.691 (p=0.00)

$SB\chi2$ / Degrees of Freedom	1.68
Root Mean Square Error of Approximation ((RMSEA)	0.0559
90 Percent Confidence Interval for RMSEA	(0.0450;0.932)
Expected Cross-validation Index (ECVI)	2.219

The fit indices for the measurement model depicted in Figure 6.8 on pg.236 below are reported in Table 6.20. The Satorra-Bentler $\chi2$ divided by the degrees of freedom is 1.68, which is lower than the acceptable value of 2 and is an indicator of a good fit. The RMSEA 0.0559<0.06 and indicates a relatively good fit (Hu & Bentler, 1991), while the upper limit of the 90% confidence interval for RMSEA (0.0932) is less than 0.08 (Browne & Sugawara, 1996). These fit indices all provide evidence of a model with a reasonable fit. Consequently, the null hypothesis that the data fits the model perfectly must be rejected. However, although the data does not fit the model perfectly, it can be described as having a good fit.

- **Sub-model B (Transformational change)**

Table 6.21 shows the fit indices for Sub-model B which assesses the relationship between the independent variables (*developmental benefits* and *human development*) *and good governance*.

Table 6.21: Fit indices for the measurement model (Sub-model B)	
(Relationship between the independent variables and good governance (intervening variable)	
Sample size	219
Degrees of Freedom	269
Satorra- Bentler Scaled Chi-Square	466.463 (p=0.00)
$SB\chi2$ / Degrees of Freedom	1.73
Root Mean Square Error of Approximation ((RMSEA)	0.0580
90 Percent Confidence Interval for RMSEA	(0.0491;0.0668)
Expected Cross-validation Index (ECVI)	2.654

The fit indices for the measurement model illustrated in Figure 6.8 on pg. 236 are reported in Table 6.21. The Satorra-Bentler $\chi2$ divided by the degrees of freedom is

1.73, which is lower than the acceptable value of 2 and is an indicator of a good fit. The RMSEA (0.0580) is less than 0.06 and indicates a close fit (Hu & Bentler, 1991), while 90% confidence interval for RMSEA (0.0668) is less than 0.08 and is considered to be in the upper limit of the confidence level (Browne & Sugawara, 1996). These fit indices all provide evidence of a model with a reasonable fit. Consequently, the null hypothesis that the data fits the model perfectly must be rejected. However, although the data does not fit the model perfectly, it can be described as having a close fit.

- **Sub-model C (Sustainable initiatives)**

Table 6.22 shows the fit indices for Sub-model C which assesses the relationship between the independent variables (*project management, strategic planning and financial management*) and *good governance*.

Table 6.22: Fit indices for the measurement model (Sub-model C)	
(Relationship between the independent variables and good governance (Intervening variable)	
Sample size	219
Degrees of Freedom	199
Satorra- Bentler Scaled Chi-Square	313.495 (p=0.00)
$SB\chi 2$ / Degrees of Freedom	1.58
Root Mean Square Error of Approximation (RMSEA)	0.0514
90 Percent Confidence Interval for RMSEA	(0.0403;0.0620)
Expected Cross-validation Index (ECVI)	1.933

The fit indices for the measurement model depicted in Figure 6.8 on pg. 236. are reported in Table 6.22. The Satorra-Bentler $\chi 2$ divided by the degrees of freedom is 1.58, which is considerably lower than the generally accepted cut-off of 2 and is an indicator of a good fit. The RMSEA (0.0514) is regarded as a good fit (Hu & Bentler, 1991), while the upper limit of the 90% confidence interval for RMSEA (0.0620) is <0.08. These fit indices all provide evidence of a model with a good fit. Consequently, the null hypothesis that the data fits the model perfectly must be rejected. However, although the data does not fit the model perfectly, it can be described as having a good fit.

- **Sub-model A (Multi-sector participation)**

Table 6.23 shows the fit indices for Sub-model C which assesses the relationship between the independent variables (*distinctive benefits, outside advice, support services* and *financial management*) and *perceived success of managing revenue* (dependent variable).

Table 6.23: Fit indices for the measurement model (Sub-model A)	
(Relationship between the independent variables and Perceived success (dependent variable)	
Sample Size	219
Degrees of freedom	94
Satorra-Bentler Scaled Chi-Square $\chi 2$	231.120 (p=0.00)
$SB\chi 2$ / Degrees of Freedom	2.46
Root Mean Square Error of Approximation (RMSEA)	0.0818
90 Percent Confidence Interval for RMSEA	(0.0685;0.952)
Expected Cross-Validation Index (ECVI)	1.446

The ratio $\chi 2$ to degrees of freedom depicted in Table 6.23 is 2.46, which is slightly higher than the acceptable value. A value of lower than 2 is an indicator of a good fit. The RMSEA (0.0818) is higher than 0.08 which indicates a poor fit (MacCullum, Browne & Sugawara, 1996), while the upper limit of the 90% confidence interval for RMSEA (0.0952,) is higher than 0.08 (Browne & Sugawara, 1996). These fit indices all provide evidence of a model that does not fit particularly well. Consequently, the null hypothesis that the data fits the model perfectly must be rejected. Bearing in mind that the purpose of the study was not to ensure a good fitting model but to assess the strength of the relationships among latent constructs in the theoretical model, it was decided not to modify the model considering that the fit indices were only marginally outside the accepted norms.

- **Sub-model B (Transformational change)**

Table 6.24 shows the fit indices for Sub-model B which assesses the relationship between the independent variables (*developmental benefits* and *human development*) and the perceived success of managing revenue (dependent variable).

Table 6.24: Fit indices for the measurement model (Sub-model B)	
(Relationship between the independent variables and perceived success (dependent variable}	
Sample size	219
Degrees of freedom	167
Satorra-Bentler Scaled Chi-Square $\chi 2$	279.470 (p=0.00)
$\mathrm{SB}\chi 2$ / Degrees of Freedom	1.67
Root Mean Square Error of Approximation(RMSEA)	0.0556
90 Percent Confidence Interval for RMSEA	(0.0439;0.0668)
Expected Cross-Validation Index (ECVI)	1.676

The ratio $\chi 2$ to degrees of freedom is 1.67, which is significantly lower than 2. A value of lower than 2 is an indicator of a good fit. The RMSEA (0.0556,) is within the reasonable fit range of 0.05 – 0.08, while the upper limit of the 90% confidence internal for RMSEA (0.0668) is less than 0.08. These indices all provide evidence of a model with a reasonable fit. Consequently, the null hypothesis that the data fits the model perfectly must be rejected. However, although the data does not fit the model perfectly, it can be described as having a reasonable or acceptable fit.

- **Sub-model C (Sustainable initiatives)**

Table 6.25 shows the fit indices for Sub-model C which assesses the relationship between the independent variables (*project management, strategic planning* and *financial management*) and the perceived *success of managing revenue*.

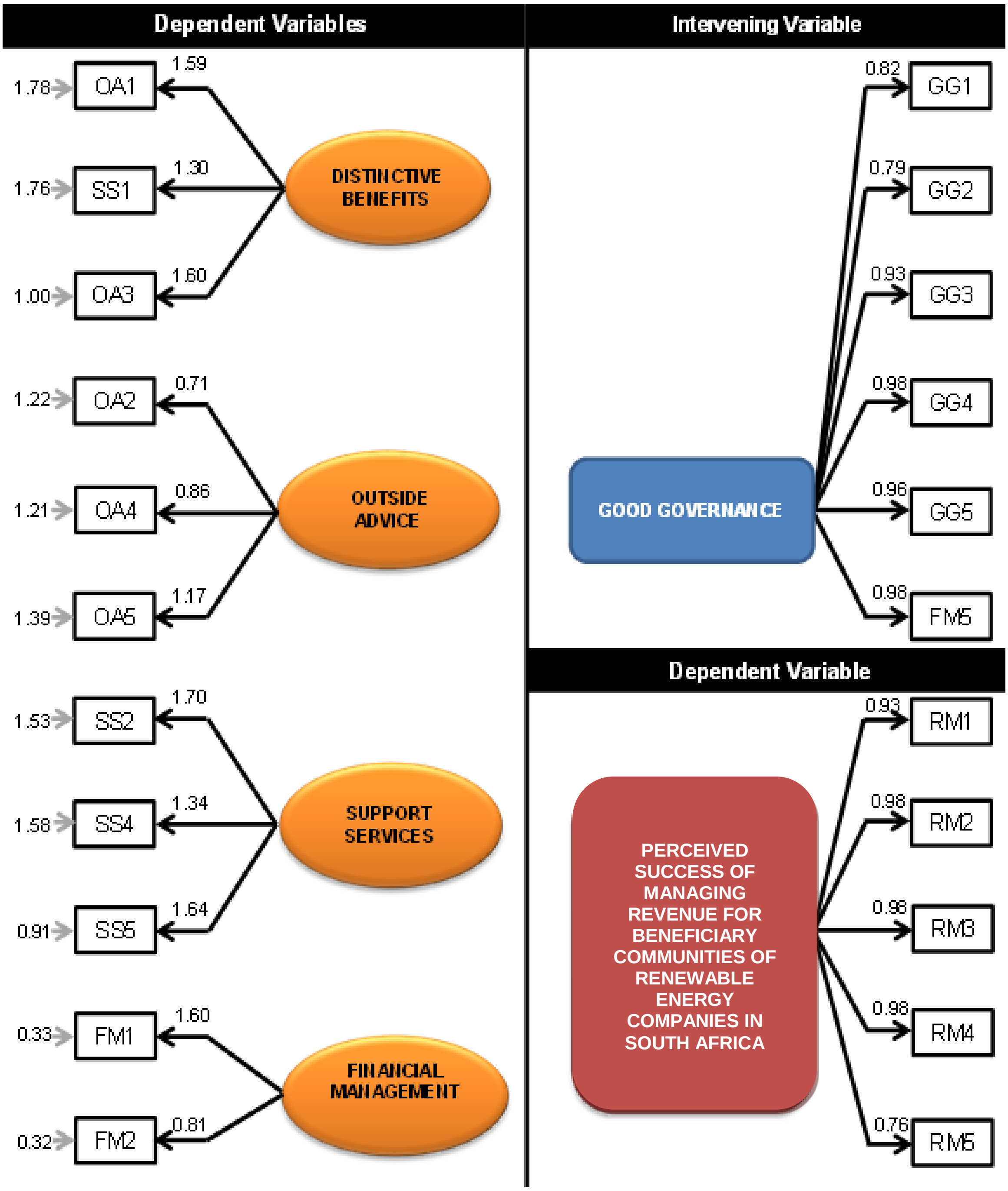
Table 6.25: Fit indices for the measurement model (Sub-model C)	
(Relationship between the independent variables and perceived success (dependent variable)	
Sample size	219
Degrees of freedom	199
Satorra-Bentler Scaled Chi-Square$\chi 2$	313.495 (p=0.00)
$SB\chi 2$ / Degrees of Freedom	1.57
Root Mean Square Error of Approximation (RMSEA)	0.0514
90 Percent Confidence Interval for RMSEA	(0.0403;0.0620)
Expected Cross-Validation Index (ECVI)	1.933

The Satorra-Bentler Chi-square divided by the degrees of freedom is 1.57, which is considerably lower than 2. A value of lower than 2 is an indicator of a good fit. The RMSEA (0.0514) is within the acceptable fit range of 0.05 – 0.08, while the upper limit of the 90% confidence internal for RMSEA (0.0620) is <0.08. These indices all provide evidence of a model with an acceptable or reasonable fit. Consequently, the null hypothesis that the data fits the model perfectly must be rejected. However, although the data does not fit the model perfectly, it can be described as having a reasonable or acceptable fit.

Therefore, no modification was made to the model.

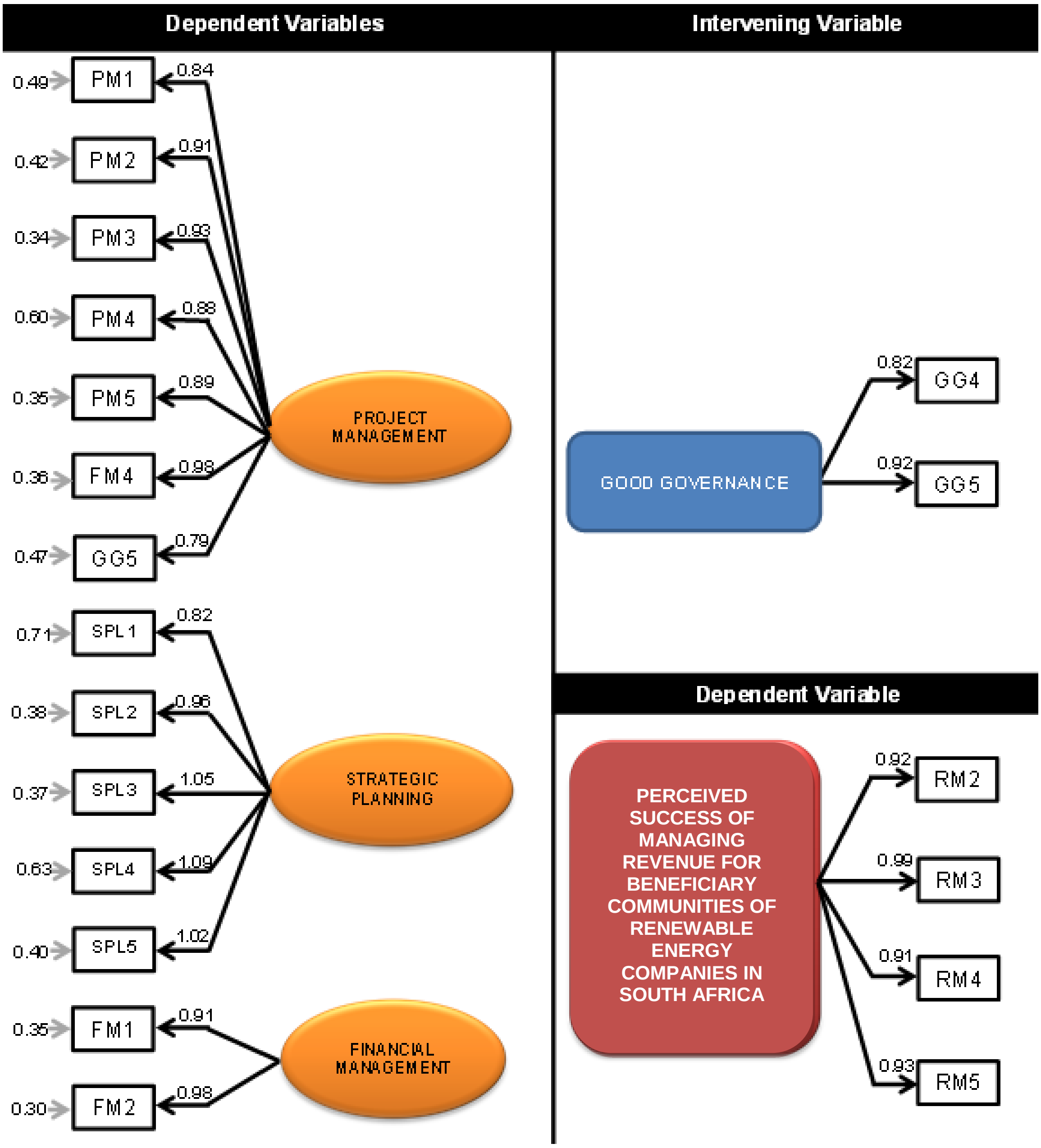
The next step in the data analysis process was to assess the relationships between the latent constructs empirically in each of the sub-models. Figures 6.5, 6.6 and 6.7 graphically present the measurement model as constructed in Table 6.15. The constructs are represented in their various indicative colours (i.e. antecedent is orange, intervening is blue and the dependent construct is red). Manifest variables are depicted in the black rectangular boxes and the measurement errors in black numbers. The arrows (the directions of which denote the causal effect) indicate the dependence relationship of the constructs.

Figure 6.5: Measurement model specifications: Sub-model A



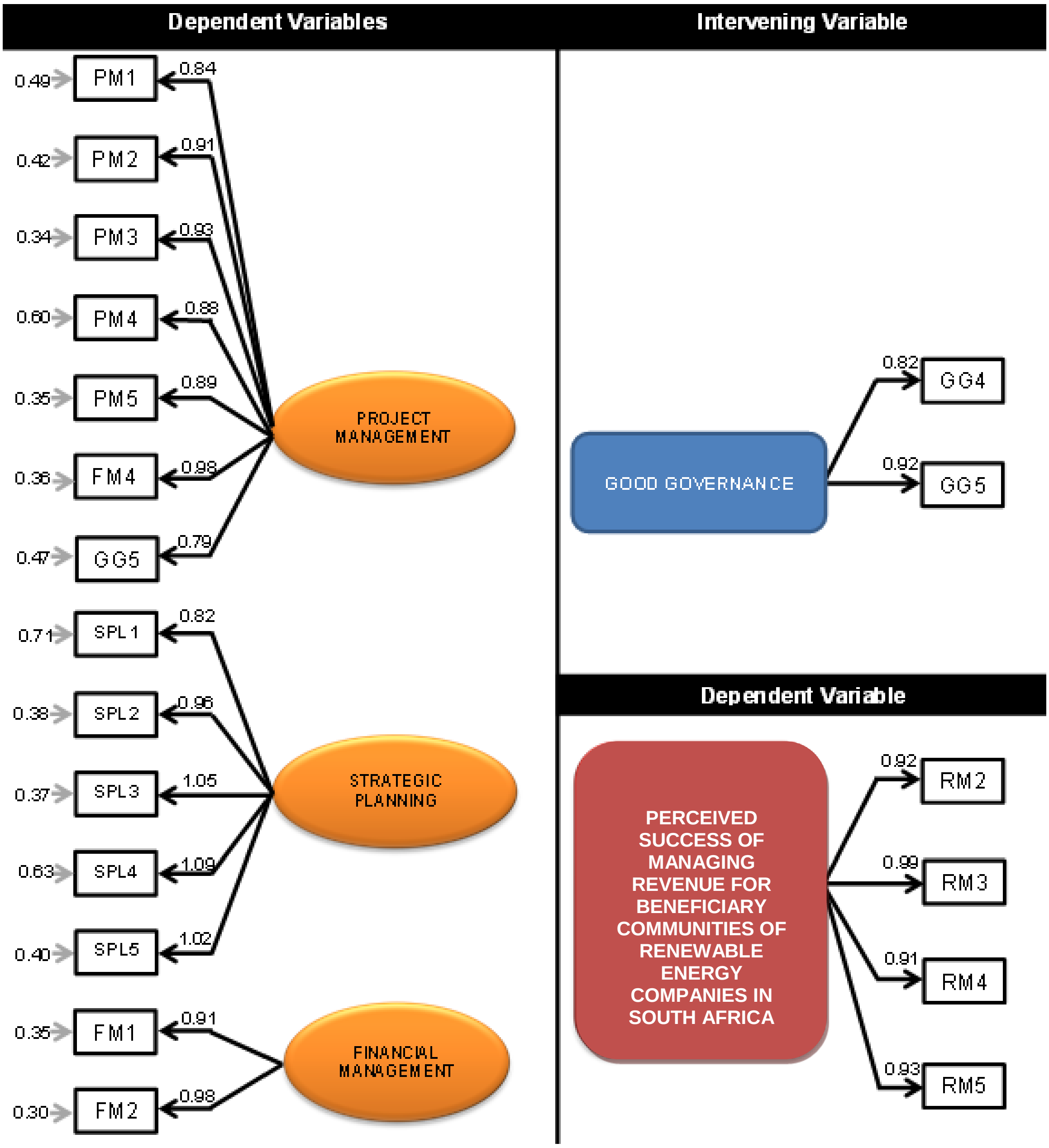
Source: Researcher's own construction

Figure 6.6: Measurement model specifications: Sub-model B



Source: Researcher's own construction

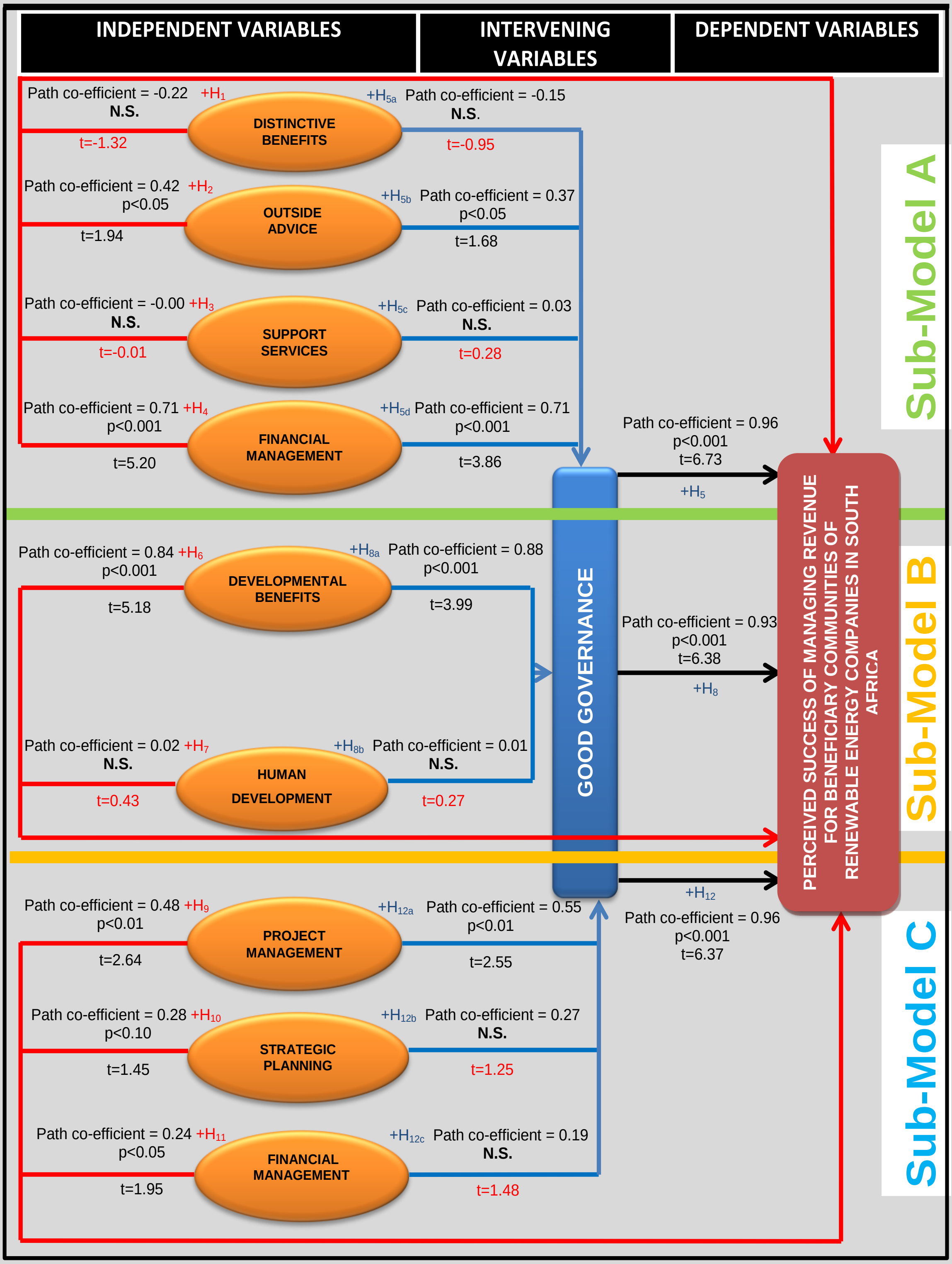
Figure 6.7: Measurement model specifications: Sub-model C



Source: Researcher's own construction

The following Figure 6.8 shows the structural model estimation as constructed in Table 6.15.

Figure 6.8: Structural Model Estimation



Source: Researcher's own construction

6.10.3 Empirical Results: Sub-Model A (Perceived Success of Managing Revenue)

In the sections below, the various steps of SEM are applied to Sub-Model A, as depicted in Figure 6.8, in order to evaluate whether the various hypotheses associated with this sub-model should be accepted or rejected.

6.10.3.1 Distinctive Benefits and the Perceived Success of Managing Revenue

H_1 There is a positive relationship between distinctive benefits and the perceived success of managing revenue.

The empirical results of this study showed that *distinctive benefits* do not have a significant influence on the perceived success of managing revenue (point estimate = - 0.22, $p > 0.00$, $t = 1.32$). Hypothesis 1 must thus be rejected.

6.10.3.2 Outside Advice and the Perceived Success of Managing Revenue

H_2 There is a positive relationship between the implementation of outside advice measures and the perceived success of managing revenue.

Various sources, both practitioner orientated and academic, have suggested that the use of *outside advice* can improve the perceived success of managing revenue and it is against this background that Hypothesis 2 was *assessed.* It can be seen from Figure 6.8 that the use of outside advice is positively related (point estimate = 0.42, $p<0.05$, $t=1.94$) to the perceived success of managing revenue at the 5% level of significance. Hypothesis 2 is thus accepted. Hypothesis 2 suggests that, when renewable energy companies make use of outside advice, it will have a favourable effect on revenue management processes. This empirical result is consistent with prior research carried out by Jonker and De Witte (2006); Engelbrecht (2009); Durant (2013); and South African Department of Social Development (2009).

6.10.3.3 Support Services and the Perceived Success of Managing Revenue

H_3 There is a positive relationship between support services and the perceived success of managing revenue.

The empirical results of this study revealed that *support services* do not have a significant influence on the perceived success of managing revenue (point estimate = - 0.00, p > 0.00, t = -0.01). Hypothesis 3 must thus be rejected.

6.10.3.4 Financial Management and the Perceived Success of Managing Revenue

H_4 There is a positive relationship between the importance of financial management and the perceived success of Managing revenue.

Various sources, including academic and industry experts, have suggested that the use of *financial management* systems will enhance the perceived success of managing revenue. It is against this background that Hypothesis 4 was assessed. Figure 6.8 illustrates that the implementation of sound financial management practices is positively related (point estimate = 0.71, p<0.001, t=5.20) to the perceived success of managing revenue for beneficiary communities. Hypothesis 4 suggests that, when renewable energy companies implement sound financial management practices, this will improve their management of beneficiary revenue significantly. This empirical result is supported by prior research carried out by D'Amato, Henderson and Florence (2009); Wong and Guggenheim (2005); Watkins, Meiers and Visser (2012) and the World Bank (2012).

6.10.4 Empirical Results: Sub-Model B (Perceived Success of Managing Revenue)

In the sections below, the various steps of SEM are applied to Sub-Model B, as depicted in Figure 6.8, in order to evaluate whether the various hypotheses associated with this sub-model should be accepted or rejected.

6.10.4.1 Developmental Benefits and the Perceived Success of Managing Revenue

H_6 There is a positive relationship between developmental benefits and the perceived success of managing revenue.

On the basis of various academic and practitioner sources that suggested that the use of *developmental benefits* would improve the perceived success of revenue management, Hypothesis 6 was assessed. Figure 6.8 confirms that *developmental benefits* are positively related (point estimate = 0.84, $p<0.001$, $t=5.18$) to the perceived success of managing revenue for beneficiary communities at the 0.01% level of significance. Hypothesis 6 must thus be accepted. Hypothesis 6 confirms that, when renewable energy companies incorporate development benefit projects such as education and infrastructure development into their socio-economic development approach, this will affect the company's management of revenue for beneficiaries positively. This empirical result concurs with prior research carried out by Halina, Wilson and Zarsky (2007); Dutton (2004) and Nyahuye (2012)

.

6.10.4.2 Human Development and the Perceived Success of managing revenue

H_7 There is a positive relationship between human development and the perceived success of managing revenue.

The empirical results of this study reveal that *human development* does not have a significant influence on the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa (point estimate = - 0.02, $p > 0.00$, $t = 0.43$). Hypothesis 7 must thus be rejected.

6.10.5 Empirical Results: Sub-Model C (Perceived Success of Managing Revenue)

In the sections below, the various steps of SEM are applied to Sub-Model C as depicted in Figure 6.8 in order to evaluate whether the various hypotheses associated with this sub-model should be accepted or rejected.

6.10.5.1 Project Management and the Perceived Success of Managing Revenue

H_9 There is a positive relationship between project management methodologies and the perceived success of revenue management

A number of sources, both academic and practitioner orientated, were of the view that the use of *project management* methods will improve the perceived success of managing revenue. It is against this background that Hypothesis 9 was assessed. It can be seen from Figure 6.8 that *project management* is positively related (point estimate = 0.48, $p<0.01$, $t=2.64$) to the perceived success of managing revenue for beneficiary communities. According to Hypothesis 9, when renewable energy companies implement project management methodologies this will improve the effectiveness of managing revenue for beneficiary communities and could promote better transformational and sustainable outcomes. this empirical result 2014is consistent with prior research carried out Gillespie (2004); Mazurkiewicz (2004) and Casey, Glennerster and Miguel (2014).

6.10.5.2 Strategic Planning and the Perceived Success of Managing Revenue

H_{10} There is a positive relationship between strategic planning and the perceived success of managing revenue.

After consulting various academic and industry practitioner sources that were of the view that the use of *strategic planning* will enhance the perceived success of managing revenue, Hypothesis 10 was assessed. The empirical results of this study revealed that *strategic planning* has a significant influence on the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa (point estimate = 0.28, $p > 0.10$, $t = 1.45$), as suggested by Hypothesis 10 with 10% level of significance. Hypothesis 10 must therefore be accepted. This means that, when renewable energy companies make use of strategic planning there will be an improvement in their management of revenue for beneficiary communities. This result is substantiated by prior research carried out by the World Bank (2007; Crowther and Aras (2008); and Petkoski and Twose (2003).

6.10.5.3 Financial Management and the Perceived Success of Managing Revenue

H_{11} There is a positive relationship between the implementation of financial management measures and the perceived success of managing revenue.

Several sources, including academic and practitioner-orientated sources who were consulted, were of the opinion that the use of *financial management* processes will significantly improve the perceived success of managing revenue. It is against this background that Hypothesis 11 was assessed. Figure 6.8 confirms that the use of *financial management* is positively related (point estimate = 0.24, $p<0.05$, $t=1.95$) to the perceived success of managing revenue at the 10% level of significance. Hypothesis 11 is thus accepted. Hypothesis 11 means that, when renewable energy companies make use of sound financial management systems, their revenue management will improve. This empirical result is supported by prior research carried out by D'Amato *et al.* (2009); Wong and Guggenheim (2005); Watkins *et al.* (*2*012 and the World Bank (2012).

6.10.6 Empirical Results: Sub-Model A (Good Governance)

In the sections below, the various steps of SEM are applied to Sub-Model A as depicted in Figure 6.8 in order to evaluate whether the various hypotheses associated with this sub-model should be accepted or rejected.

6.10.6.1 Good Governance and Perceived Success of Managing Revenue

H_5 There is a positive relationship between good governance and the perceived success of managing revenue.

Several sources, both academic and practitioner orientated, have suggested that the implementation of *good governance* practices can enhance the perceived success of managing revenue. Figure 6.8 confirms that the use of *good governance* practices is positively related (point estimate = 0.96, $p<0.001$, $t=6.37$) to the perceived success of managing revenue for beneficiary communities at the 0.1% level of significance. Hypothesis 5 is thus accepted. Hypothesis 5 suggests that when good governance measures are introduced by renewable energy companies in the management of beneficiary revenues, the outcomes of community development projects will be significantly improved. Researchers and writers such as Jonker and De Witte (2006); Walker and Mokoena (2011); Engelbrecht (2009); Erasmus (2014); Johnston (2009); Boyce, Griffith and King (2007); Rossouw (2012) concur with this empirical finding.

6.10.6.2 Distinctive Benefits and Good Governance

H_{5a} There is a positive relationship between distinctive benefits and good governance.

The empirical results of this study showed that *distinctive benefits* do not have a significant influence on good governance (point estimate = - 0.15, $p > 0.00$, $t = -0.95$) contrary to what was stated in Hypothesis 5_a. Hypothesis 5_a must thus be rejected.

6.10.6.3 Outside Advice and Good Governance

H_{5b} There is a positive relationship between the implementation of outside advice and good governance.

Several sources, both academic and practitioner orientated, have suggested that the use of *outside advice* can enhance the good governance practices of RE companies. It is against this background that Hypothesis 5_a was assessed. It can be seen from Figure 6.8 that the use of *outside advice* is positively related (point estimate = 0.37, $p<0.10$, $t=1.68$) to good governance at the 5% level of significance. Hypothesis 5_b is thus accepted. Hypothesis $5_{\mathbf{b}}$ suggests that, when renewable energy companies make use of outside advice before and during the implementation of community development projects in beneficiary communities they will improve their governance practices. This empirical result is supported by prior research carried out by Jonker and De Witte (2006); Engelbrecht (2009); Durant (2013); and the South African Department of Social Development (2009).

6.10.6.4 Support Services and Good Governance

H_{5c} - There is a positive relationship between support services and good governance.

The empirical results of this study revealed that *support services* do not influence the intervening variable of good governance (point estimate = - 0.03, $p > 0.00$, $t = -0.28$) contrary to what was stated in Hypothesis 5_c. Hypothesis 5_c is therefore rejected.

6.10.6.5 Financial Management and good governance

H_{5d} There is a positive relationship between financial management and good governance.

Several sources, both academic and practitioner orientated, have suggested that the use of *financial management* practices can improve the good governance practices of RE companies. It is against this background that $H5_d$ was assessed.

It can be seen from Figure 6.8. that there is a positive relationship between the use of *financial management* (point estimate = 0.71, $p<0.001$, $t=3.86$) and good governance at the 1% level of significance. Hypothesis 5_d is thus accepted. Hypothesis 5_d means that, when renewable energy companies make use of sound financial management systems, their governance practices will be improved significantly. This empirical result is supported by researchers and authors such as Jonker and De Witte (2006); Nickols (2016); Tang *et al.* (2013); Kepner and Wysocki (2012); Hill (2008); Paramasivan and Subramanian (2009).

6.10.7 Empirical Results: Sub-Model B (Good Governance)

In the sections below, the various steps of SEM are applied to Sub-Model B, as depicted in Figure 6.8. in order to evaluate whether the various hypotheses associated with this sub-model should be accepted or rejected.

6.10.7.1 Good Governance and Perceived Success of Managing Revenue

H_8 There is a positive relationship between good governance and the perceived success of managing revenue.

Various sources, both academic and practitioner orientated, have suggested that the use of *good governance* practices can improve the perceived success of revenue management by RE companies. H_8 was assessed against this background.

The results recorded in Figure 6.8 confirm that the use of good governance practices is positively related (point estimate = 0.93, $p<0.001$, $t=6.38$) to the perceived success of managing revenue for beneficiary communities at the 0.1% level of significance. Hypothesis 8 is thus accepted. Hypothesis 8 means that, when good governance measures are implemented, this will result in an improvement in the integrity of managing revenue for beneficiary communities. This empirical result concurs with previous research carried out by Jonker and De Witte (2006); Walker and Mokoena

(2011); Engelbrecht (2009); Erasmus (2014); Johnston (2009); Boyce *et al.* (2007); Rossouw, 2012.

6.10.7.2 Developmental Benefits and Good Governance

H_{8a} There is a positive relationship between developmental benefits and good governance

Various sources, both academic and practitioner orientated, have suggested that the use of *developmental benefits* can improve the perceived success of revenue management by RE companies. H_{8a} was assessed against this background.

Figure 6.8 confirms that *developmental benefits* are positively related (point estimate = 0.88, $p<0.001$, $t=3.99$) to the intervening variable of good governance at the 0.1% level of significance. Hypothesis 8a is thus accepted. This hypothesis suggests that when renewable energy companies consider the implementation of developmentally beneficial projects (education and infrastructure development), this will improve the company's good governance approach to managing revenue for beneficiaries. Prior research carried out by Pierre-Richard and Agenor (2013); Dorel *et al.* (2015); Boateng (2012); Fourie (2006); Economic Commission for Africa (2013) confirms this empirical result.

6.10.7.3 Human Development and Good Governance

H_{8b} There is a positive relationship between human development and good governance.

The empirical results of this study revealed that *human development* does not have a significant influence on good governance (point estimate = - 0.01, p > 0.00, t = -0.27), which disagrees with what was proposed in Hypothesis 8_b. Hypothesis 8_b is thus rejected.

6.10.8 Empirical Results: Sub-Model C (Good Governance)

In the sections below, the various steps of SEM are applied to Sub-Model C, as depicted in figure 6.8, in order to evaluate whether the various hypotheses associated with this sub-model should be accepted or rejected.

6.10.8.1 Good Governance and Perceived Success of Managing Revenue

H_{12} There is a positive relationship between good governance and the perceived success of managing revenue.

A number of academic and practitioner orientated sources have suggested that the use of *good governance* practices can have a positive effect on the perceived success of managing revenue and it is against this background that H_{12} was assessed. Figure 6.8. confirms that the use of *good governance* practices is positively related (point estimate = 0.96, $p<0.001$, $t=6.37$) to the perceived success of managing revenue for beneficiary communities at the 0.1% level of significance. Hypothesis 12 is thus accepted. Hypothesis 12 suggests that, when companies implement governance measures, this will improve the managing of revenues for beneficiary communities and possibly ensure more successful project outcomes. Prior research carried by Jonker and De Witte (2006); Walker and Mokoena (2011); Engelbrecht (2009); Erasmus (2014); Johnston (2009); Boyce *et al.* (2007); Rossouw (2012) supports this empirical result.

6.10.8.2 Project Management and Good Governance

H_{12a} There is a positive relationship between project management methodologies and good governance

Hypothesis 12_a was assessed on the basis of various sources, including academic and practitioner orientated, who were of the opinion that the implementation of *project management* methodologies would improve good governance practices. Figure 6.8 confirms that *project management* is positively related (point estimate =

0.55, $p<0.01$, $t=2.55$) to good governance at the 10% level of significance. Hypothesis 12_a must thus be accepted. According to Hypothesis 12_a, when renewable energy companies implement project management methodologies, this will improve the effectiveness of managing revenue for community projects and could thereby promote better transformational and sustainable outcomes. This empirical result is consistent with prior research carried by City of Chandler (2010; Hemson, Meyer and Kealeboga (2004); Too and Weaver (2013); PMI (2013); Van der Walt (2012).

6.10.8.3 Strategic Planning and Good Governance

H_{12b} There is a positive relationship between the extent of strategic planning and good governance.

The empirical results of this study reveal that, contrary to expectations, *strategic planning* does not have a significant influence on good governance (point estimate = - 0.27, $p > 0.00$, $t = -1.25$). Thus, Hypothesis H_{12b} must be rejected.

6.10.8.4 Financial Management and Good Governance

H_{12c} **-**There is a positive relationship between the implementation of financial management measures and good governance

Several sources, both academic and practitioner orientated, have suggested that the use of *financial management* practices can improve the good governance practices of RE companies. It is against this background that H_{12c} was assessed. From Figure 6.8, it can be seen that there is a positive relationship between the implementation of sound financial management (point estimate = - 0.19, $p > 0.00$, $t = 1.48$) and good governance at the 10% level of significance. Hypothesis 12c is thus accepted. This empirical result is supported by prior research carried out by Jonker and De Witte (2006); Nickols (2016); Tang *et al.* (2013); Kepner and Wysocki (2012); Hill, 2008; Paramasivan and Subramanian (2009).

6.11 Step 5: Assessing the Identification of the Structural Model

The fifth step in SEM is to assess the identification of the structural model and involves ascertaining whether the software programme (LISREL) has produced meaningless or illogical results (Hair *et al.*, 2010). Essentially, an identification problem is the inability of the proposed model to produce unique estimates (Hair *et al.*, 2010). In order to evaluate the identification of the structural model, the size of the co-variance matrix relative to the number of estimated co-efficients is of concern. According to Hair *et al.* (2010: 606), the difference between the number of co-variance and the actual number of co-efficients in the proposed model is termed "degrees of freedom".

Hair *et al.* (2010) point out that there is no single rule that confirms the identification of a model, but proposes two reliable indicators rank and order conditions. Hair *et al* (2010), indicate that in terms of the order condition, the model's degree of freedom should be equal to or greater than zero (Hair *et al.*, 2010). A just-identified model has exactly zero degrees of freedom, whereas an over-identified model has a positive number of degrees of freedom (Hair *et al.*, 2010). An over-identified model is the goal of all structural equation models (Hair *et al.*, 2010) and these over-identified models should have more information in the data matrix than the number of parameters to be estimated. What this means is that the larger the degrees of freedom, the more identified the model will be.

For the revised empirical model (independent variables and intervening variable), the degrees of freedom are 219 (Sub-Model A), 202 (Sub-Model B) and 271 (Sub-Model C) and for the empirical model (independent variables and dependent variable), degree of freedom are 219 (Sub- Model A), 167 (Sub-Model B) and 129 (Sub-Model C). In all of these models, the degrees of freedom are significantly greater than zero. The indicators for the three sub-models prove that there is no danger that the proposed theoretical model would produce meaningless or illogical results when generating unique estimates. The rank condition must be met by the proposed theoretical model in which certain existing heuristics are used to test it (Hair *et al.*, 2010). The three-measure rule, which asserts that any constructs with three or more indicators will always be identified, is the simplest of these (Hair *et al.*, 2010). In the present study, no single construct has less than three indicators and this also indicates a reduced risk of model identification problems.

6.12 Step 6: Evaluating the Results for Goodness-of-Fit of the Structural Model

The sixth step in SEM is to evaluate the goodness-of-fit of the structural model. According to Hair *et al.* (2010), the first assessment of goodness-of-fit must be done for the overall model (Hair *et al.*, 2010). By applying several tests of goodness-of-fit, the proximity of fit between the data and the model can be assessed (Hair *et al.*, 2010). The degree to which the structural equation model fits the sample data is evaluated by the goodness-of-fit. Model fit criteria commonly used are chi-square ($\chi 2$), goodness-of-fit index (GFI), adjusted goodness-of-fit index (AGFI), and root-mean-square residual (RMR), (Schumacker & Lomax, 1996). The commonly used goodness-of-fit (GOF) measure was not used in the present study owing to the use of Robust Maximum Likelihood as the method of estimation. Some of the fit indices evaluate different aspects of fit and it is important to evaluate fit based on multiple fit statistics, so that judgments will not be an artefact of analytic choice (Hair *et al.*, 2010). Assessment of model adequacy must be based on multiple criteria that take into account theoretical, statistical, and practical considerations (Grimm & Yarnold, 2000).

The overall model fit provided by the chi-square $\chi 2$ value is often used as the first step in evaluating model acceptance or rejection (Baumgartner & Homburg, 1996). The $\chi 2$ statistic in isolation is not a meaningful statistic without taking into account the degrees of freedom (df) of a model (Baumgartner & Homburg, 1996). A significant $\chi 2$ value relative to the degrees of freedom indicates that the observed and estimated matrices differ. Statistical significance indicates the probability that this difference is due to sampling variation. A non-significant $\chi 2$ value indicates that the two matrices are not statistically different. The $\chi 2$ criterion is, however, sensitive to sample size. If the sample size increases (generally above 200), the $\chi 2$ test has a tendency to indicate a significant probability level (Schumaker & Lomax, 1996). As the chi-square test is sensitive to sample size (the sample size for the current study is 219), it can lead to a rejection of a model differing in a trivial way from the data for large sample sizes. It is prudent, therefore, to examine other measures of fit (Bagozzi & Heatherton, 1994; Baumgartner & Homburg, 1996; Ferrara, 2000:106). Thus, a comparison of the GFI, AGFI, and RMR measures, which are independent of sample size, was performed to assess the model's fit (Smith *et al.,* 1996).

Root mean square error of approximation (RMSEA) is another measure that attempts to correct for the tendency of the chi-square statistic to reject any specified model with a sufficiently large sample (Hair *et al.*, 2010). RMSEA expresses the difference between the observed and estimated co-variance matrices in terms of degrees of freedom of the model, and is a fit index that focuses on estimated population fit. An empirical examination of several measures has found that the RMSEA was best suited to use in a confirmatory strategy with larger samples (Hair *et al.*, 2010).

Although rarely encountered, RMSEA values below 0.01 would indicate a model that fits the data exceptionally well, since values approaching zero are desired. Different RMSEA cut-off values have been suggested: some consider values below 0.05 to indicate a very good fit (Spangenberg & Theron, 2002); others indicate that values between 0.05 and 0.08 are indicative of acceptable fit (Baumgartner & Homburg, 1996; Hair *et al.*, 2010; Grimm & Yarnold, 2000). Hu and Bentler (1999) suggest a cut-off value close to 0.06 for RMSEA before one can conclude that there is a relatively good fit (Hu & Bentler, 1999).

The 90% confidence interval (CI) around each path estimate is very useful for model fit assessment (Browne & Cudeck, 1993). The CI provides an explicit indication of the degree of parameter estimate precision (Shah & Goldstein, 2006). Additionally, the statistical significance of path estimates can be inferred from the 90% CI. If the 90% CI includes zero, then the path estimate is not significantly different from zero (at a = 0.05), (Shah & Goldstein, 2006). If the 90% CV is <0.08 it is in the upper limit of confidence level (Roberts, Stephen & Ilardi, 2003). The following table is a summary of the above values and criteria which were used to determine the GOF of the structural models.

Once the model has been confirmed as providing acceptable estimates, the goodness-of-fit can then be assessed (Hair *et al.*, 2010). The indices for the goodness-of-fit for the structural model depicted in Figure 6.8 are shown in Tables 6.26, 6.27, 6.28, 6.29, 6.30 and 6.31 below.

It is emphasised that the objective of the current study was not to establish a well-fitting model, but rather to use SEM to test the strength of the relationships amongst the latent variables in the proposed theoretical model empirically. The Robust Maximum Likelihood was used as the estimation process as recommended by Satorra-Bentler (1994) because the data used in the current study were not normally distributed. Also, because of the non-normality distribution, the adjusted goodness-of-fit (AGFI) and the goodness-of-fit index (GFI) should not be used to assess model fit. This denotes that the purpose of the statistical analysis was focused on assessing relationships rather than model fit.

Table 6.26: Goodness-of-fit indices for the structural model (Sub-model A)	
Independent and intervening (good governance) variables	
GOODNESS-OF-FIT STATISTICS	
Sample size	219
Degrees of Freedom	219
Satorra- Bentler Scaled Chi-Square	371.234 (p=0.00)
$SB\chi 2$ / Degrees of Freedom	1.70
Root Mean Square Error of Approximation ((RMSEA)	0.0565
90 Percent Confidence Interval for RMSEA	(0.0464;0.0662)
Expected Cross-validation Index (ECVI)	2.226

The Satorra-Bentler $\chi 2$ divided by the degrees of freedom ratio is 1.70, which is lower than the acceptable value of 2 and is an indicator of a good fit. The RMSEA 0.0565 <0.06 indicates a relatively very close fit (Hu & Bentler, 1991), while the upper limit of the 90% confidence interval for RMSEA (0.0662) is less than 0.08 (Roberts, Stephen & Ilardi, 2003). These fit indices all provide evidence of a model with a good fit. Subsequently the null hypothesis that the data fits the model perfectly must be rejected. However, although the data does not fit the model perfectly, it can be described as having a good fit.

Table 6.27: Goodness-of-fit indices for the structural model (Sub-Model B)	
Independent and intervening (good governance) variables	
GOODNESS-OF-FIT STATISTICS	
Sample size	219
Degrees of Freedom	271
Satorra- Bentler Scaled Chi-Square	471.228 (p=0.00)
$SB\chi 2$ / Degrees of Freedom	1.74
Root Mean Square Error of Approximation ((RMSEA)	0.0582
90 Percent Confidence Interval for RMSEA	(0.0493;0.0669)
Expected Cross-validation Index (ECVI)	2.657

The Satorra-Bentler $\chi 2$ to degrees of freedom ratio is 1.74, which is lower than 2. Values lower than 2 indicate a good fit (Politis, 2003; Ullman, 1996). The RMSEA (0.0582),is less than 0.06 and indicates a very close fit (Hu & Bentler, 1991), while the upper limit of the 90% confidence interval for RMSEA 0.0669 is less than 0.08 (Roberts, Stephen & Ilardi, 2003). These fit indices all provide evidence of a model with a good fit. Consequently, the null hypothesis that the data fits the model perfectly must be rejected. However, although the data does not fit the model perfectly, it can be described as having a good fit.

Table 6.28: Goodness-of-fit indices for the structural model (Sub-model C)	
Independent and intervening (good governance) variables	
GOODNESS-OF-FIT STATISTICS	
Sample size	219
Degrees of Freedom	202
Satorra- Bentler Scaled Chi-Square	325.507 (p=0.00)
$SB\chi 2$ / Degrees of Freedom	1.61
Root Mean Square Error of Approximation ((RMSEA)	0.0530
90 Percent Confidence Interval for RMSEA	(0.0421;0.0634)
Expected Cross-validation Index (ECVI)	1.961

The goodness-of-fit indices for the structural model depicted in Figure 6.8 are reported in Table 6.19. The Satorra-Bentler $\chi 2$ divided by the degrees of freedom ratio is 1.61, which is considerably lower than 2. Values lower than 2 are considered a close fit. The RMSEA, 0.0530< 0.06, which is regarded as a very close fit (Hu & Bentler, 1991), while the upper limit of the 90% confidence interval for RMSEA (0.0634) is <0.08. These fit indices all provide evidence of a model with a close fit. Consequently, the null hypothesis that the data fits the model perfectly must be rejected. However, although the data does not fit the model perfectly, it can be described as having a close fit.

Table 6.29: Goodness-of-fit indices for the structural model (Sub-model A)	
Independent and dependent (perceived success) variables	
GOODNESS-OF-FIT STATISTICS	
Sample size	219
Degrees of Freedom	94
Satorra- Bentler Scaled Chi-Square	231.120 (p=0.00)
$\mathrm{SB}\chi 2$ / Degrees of Freedom	2.46
Root Mean Square Error of Approximation ((RMSEA)	0.0818
90 Percent Confidence Interval for RMSEA	(0.0685;0.0952)
Expected Cross-validation Index (ECVI)	1.446
Sample size	0.961

The Satorra Bentler $\chi 2$ divided by the degrees of freedom ratio is 2.46, which is slightly higher than the acceptable value of 2. Values <2 indicate a good fit. The RMSEA (0.0818), which is marginally greater than 0.08, indicates a poor fit according to MacCullum, Browne and Sugawara (1996), while the upper limit of the 90% confidence interval for RMSEA (0.0952) is in the range of 008 – 0.10, which is considered a mediocre or inadequate fit according to MacCullum, Browne and Sugawara (1996) and Roberts and Ilardi (1982). However, according to the Comparative Fit Index (CFI) of 0.961, the fit of this model is poor but marginally so (Roberts & Ilardi, 1982).

Table 6.30: Goodness-of-fit Indices for the Structural Model (Sub-Model B)	
Independent and dependent (perceived success) variables	
GOODNESS-OF-FIT STATISTICS	
Sample size	219
Degrees of Freedom	167
Satorra- Bentler Scaled Chi-Square	279.470 (p=0.00)
$SB\chi2$ / Degrees of Freedom	1.67
Root Mean Square Error of Approximation ((RMSEA)	0.0556
90 Percent Confidence Interval for RMSEA	(0.0439;0.0668)
Expected Cross-validation Index (ECVI)	1.676

The Satorra-Bentler $\chi2$ divided by the degrees of freedom is 1.67, which is lower than 2 and indicates a good fit (Politis, 2003; Ullman, 1996). The RMSEA (0.0556) is less than 0.06 and indicates a good fit (Hu & Bentler, 1991), while the upper limit of the 90% confidence interval for RMSEA (0.0668) is less than 0.08, which is in the upper limit of the confidence level (good fit), (Roberts, Stephen & Ilardi, 2003). These fit indices all provide evidence of a model with a good fit. Consequently, the null hypothesis, that the data fits the model perfectly, must be rejected. However, although the data does not fit the model perfectly, it can be described as having a good fit.

Table 6.31: Goodness-of-fit Indices for the structural model (Sub-model C)	
Independent and dependent (perceived success) variables	
GOODNESS-OF-FIT STATISTICS	
Sample size	219
Degrees of Freedom	129
Satorra- Bentler Scaled Chi-Square	202.449 (p=0.00)
$SB\chi2$ / Degrees of Freedom	1.57
Root Mean Square Error of Approximation ((RMSEA)	0.0511
90 Percent Confidence Interval for RMSEA	(0.0371;0.0643)
Expected Cross-validation Index (ECVI)	1.314

The goodness-of-fit indices for the structural model depicted in Figure 6.8 are reported in Table 6.27. The Satorra-Bentler $\chi2$ divided by the degrees of freedom is

1.57, which is considerably lower than 2. Values lower than 2 are considered to be a close fit. The RMSEA (0.0530) < 0.06 which is regarded as a close fit (Hu & Bentler, 1991), while the upper limit of the 90% confidence interval for RMSEA (0.0643) is less than 0.08 (good fit) and is considered to be below the upper limit of the confidence level. These fit indices all provide evidence of a model with a close fit. Consequently, the null hypothesis that the data fits the model perfectly must be rejected. However, although the data does not fit the model perfectly, it can be described as having a close fit.

6.13 Step 7: Modifications to the Model

The seventh step in the SEM analysis is to interpret and modify the proposed theoretical model if necessary. Hair *et al.* (2010) believes that once the model is deemed acceptable, the results should be examined first for their correspondence to the proposed theory. Based on observations and the empirical results of this research, it is confirmed that, in all three sub-models, all the principal relationships in the theory are supported, as expected, and statistically significant. Hair *et al.* (2010), further recommend that, once the model interpretations are complete, ways to improve model fit and/or its correspondence to the underlying theory should most likely be considered (Hair *et al.*, 2010). Model re-specification is the process of adding or deleting estimated parameters in the original model in an attempt to obtain a better goodness-of-fit result. Such modifications can, however, **only** be made if they are substantiated by theoretical justification for what is deemed significant empirically (Hair et al., 1998).

The final phase in the data analysis was to test all the hypotheses. Based on the empirical results of the path co-efficients, all the hypotheses that have been defined can be interpreted as being either supported or not. Table 6.20 6.32 ?? shows a summary of all the tested hypotheses.

Table 6.32: Summary of all the hypotheses		
SUMMARY OF ALL THE HYPOTHESES		
Sub-Model A – Multi-Sector Participation		
H_1	There is a positive relationship between *distinctive benefits* and the perceived success of managing revenue.	NOT SUPPORTED
H_2	There is a positive relationship between the implementation of *outside advice* measures and the perceived success of managing revenue.	SUPPORTED
H_3	There is a positive relationship between *support services* and the perceived success of managing revenue	NOT SUPPORTED
H_4	There is a positive relationship between the importance of *financial management* and the perceived success of managing revenue	SUPPORTED
H_5	There is a positive relationship between the use of *good governance* and the perceived success of managing revenue	SUPPORTED
H_{5a}	There is a positive relationship between *distinctive benefits* and good governance.	NOT SUPPORTED
H_{5b}	There is a positive relationship between the implementation of *outside advice* and good governance.	SUPPORTED
H_{5c}	There is a positive relationship between *support services* and good governance.	NOT SUPPORTED
H_{5d}	There is a positive relationship between *financial management* and good governance.	SUPPORTED
Sub-Model B – Transformational Change		
H_6	There is a positive relationship between *developmental benefits* and the perceived success of managing revenue.	SUPPORTED
H_7	There is a positive relationship between *human development* and the perceived success of managing revenue	NOT SUPPORTED
H_8	There is a positive relationship between *good governance* and the perceived success of managing revenue	SUPPORTED
H_{8a}	There is a positive relationship between *developmental benefits* and good governance.	SUPPORTED
H_{8b}	There is a positive relationship between *Human development* and good governance.	NOT SUPPORTED
Sub-Model c – Sustainable Initiatives		
H_9	There is a positive relationship between *project management* methodologies and the perceived success of managing revenue.	SUPPORTED

H_{10}	There is a positive relationship between the extent of *strategic planning* and the perceived success of managing revenue.	SUPPORTED
H_{11}	There is a positive relationship between the implementation of *financial management* measures and the Perceived success of managing revenue.	SUPPORTED
H_{12}	There is a positive relationship between *good governance* and the Perceived success of managing revenue.	SUPPORTED
H_{12a}	There is a positive relationship between *project management* methodologies and good governance.	SUPPORTED
H_{12b}	There is a positive relationship between the extent of *strategic planning* and good governance.	NOT SUPPORTED
H_{12c}	There is a positive relationship between the implementation of *financial management* measures and good governance.	SUPPORTED

6.14 Summary

The empirical results of the current study were presented in this chapter. The proposed theoretical model of the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa was tested empirically by means of Structural Equation Modelling. The influences of specifically identified factors were tested empirically to determine their influence on the dependent variable of the perceived success of managing revenue. These factors included:

- Distinctive benefits
- Outside advice
- Support services
- Financial management
- Developmental benefits
- Human development
- Project management
- Strategic planning
- Good governance

In the first instance, the focus was on the descriptive statistics and, thereafter, attention was given to the results of the exploratory factor analysis. The empirical analysis confirmed that the revenue management scale used in this study was both valid and reliable.

In this chapter, the splitting of the proposed theoretical model into three sub-models (A, B and C) with the themes of *multi-sector participation, transformational change* and *sustainable initiatives* respectively was also recorded. These themes were chosen in relation to their grouped constructs. Lastly, the empirical results were assessed against the formulated hypotheses. In the concluding Chapter 7, the findings reported in this chapter are interpreted with reference to their inferences for managing revenue for beneficiary communities of renewable energy companies in South Africa.

Chapter 7
Summary, Conclusions, Case Study and Recommendations

7.1 Introduction

Chapter 7 contains an overview of the study as well as a discussion of the significant findings based on the empirical results presented in Chapter 6. The empirical results are discussed against the background of informal insights gained during the study and professional working experience in social and economic development environments in the renewable energy sector in South Africa. An interpretation of the findings, as well as the implications for managing revenue for beneficiary communities of renewable energy companies in South Africa, is offered. Recommendations based on the empirical results, as well as a case study of managing revenue effectively for and by beneficiary communities, are discussed. The last part of the chapter includes the implications of the research results, followed by a discussion about the limitations of the study as well as suggestions for future research in this field of study.

7.2 Synopsis of the study

This study was concerned with the development of a theoretical model of the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa. The factors that influence the successful management of revenue for beneficiary communities were selected on the basis of a review of the available literature. A proposed theoretical model of independent, intervening and dependent variables was presented graphically. Operationalisations were formulated for each of the latent variables in the theoretical model based on the literature and the opinions of experts in the field. Each of the variables was operationalised by developing items that were included in the measuring instrument.

The formulation of the items in the research instrument was based on previous comparable research, opinions from industry experts, the literature review and the researcher’s own construction. A positive relationship between each of the independent variables and the dependent variable of the perceived success of managing revenue was hypothesised. Hypotheses for the inter-relationship between the independent variables and the intervening variable of good governance were also proposed.

Preliminary testing was done on the proposed theoretical model by engaging with industry experts and academics. Minor changes were made to the proposed theoretical model before the questionnaire was pre-tested with 27 respondents from the renewable energy sector in order to ensure ease of understanding and timely completion. Minor changes were made to some of the items on the questionnaire and specialists, industry experts, and practitioners from various institutions were invited to participate in this study. The link to the online questionnaires was sent to public, private and academic institutions, both locally and internationally.

The main research problem of the study was introduced in Chapter 1 as follows:
To identify the organisational and social variables that affect the sustainability and promotion of successful management of revenue for the beneficiary communities of renewable energy companies in South Africa.

The desired outcome of the study was to develop a model that will ensure the effective management of revenue for beneficiary communities of renewable energy companies in South Africa. In order to address the research problem and achieve the desired outcome, specific areas of interest were identified which included the renewable energy sector and managing revenue for beneficiary communities (encompassing community development and corporate social responsibility). The findings of the literature review were discussed in the following chapters:

- Chapter 2: The renewable energy sector
- Chapter 3: Managing revenue management for beneficiary communities

The literature study led to a theoretical framework of factors that affect the management of revenue for beneficiary communities of renewable energy companies. In Chapter 2, some of the different forms of renewable energy as an alternative source of energy were reviewed as well as the application of these energy sources globally, in the BRICS countries, in Africa and in RSA. The researcher investigated the link between renewable energy and socio-economic development globally, in BRICS countries, in Africa and in the RSA and also reviewed the REIPPP Programme specifically in South Africa and its implications for socio-economic development in the country. This researcher also explored stakeholder theory and the important role that it plays in revenue management for beneficiary communities.

In Chapter 3, the researcher investigated the link between corporate social responsibility (CSR) and the SED and ED obligations presented by the REIPPP Programme. This examination covered the global, BRICS, African and RSA perspectives on CSR. This chapter included a review of four CSR models and the best practices that could be drawn from them. Lastly, in this chapter, the researcher assessed the SED and ED obligations of the REIPPP Programme and the challenges and opportunities which the obligations present for the renewable energy sector in RSA.

Following from the literature review, the various constructs influencing the management of revenue for beneficiary communities were identified and then the relationships among them were empirically tested through the application of a theoretical model presented in Chapter 4.

The primary objective, therefore, was to develop a model for the successful management of revenue for beneficiary communities of renewable energy companies in South Africa. To address the primary objective of this study, the following research design objectives were identified:

- To analyse the existing global guidelines governing revenue management;
- To analyse existing ‘best practices” employed by global professionals in socio-economic and enterprise development consultancies;
- To evaluate the synergies between existing theoretical guidelines and practical procedures related to modelling the management of revenue for beneficiary communities in RSA;
- To identify the factors (variables) that will promote the sustainability and success of managing revenue for beneficiary communities in RSA;
- To develop a theoretical model, propose appropriate hypotheses, and construct a path diagram of relationships between the independent variables and the dependent variable.

To realise the research design objectives, a number of secondary objectives were developed:

- To construct a theoretical model that would describe the hypothesised relationships among the latent variables;
- To develop a measuring instrument that would assess the relationships described in the theoretical model empirically;
- To test the theoretical model and suggested hypotheses empirically by sourcing primary data from renewable industry experts and community development practitioners nationally and internationally, and by statistically analysing the sourced data;
- To discuss the results and interpretation of the research and make appropriate, meaningful recommendations based on the results of the statistical analysis;

The dependent variable was the perceived success of managing revenue for beneficiary communities, with good governance modelled as an intervening variable. Although theoretically modelled as an intervening variable, the role of good governance as a potential intervening variable was not statistically assessed. There were a total of 10 independent variables identified including: outside advice, financial management, change management, human development, education, support services, strategic planning, strategic partnerships, infrastructure development and project management. The positive relationship between these independent variables was illustrated in the theoretical model as represented in Chapter 4 and each relationship was linked to a hypothesis. Each of the latent variables was then operationalised. The scale development and operationalisation of each of the latent variables was described. It is generally accepted that the operational definitions do not guarantee the accuracy of the proposed model. However, it aids the interpretation of the results.

7.3 Conclusions from the Study

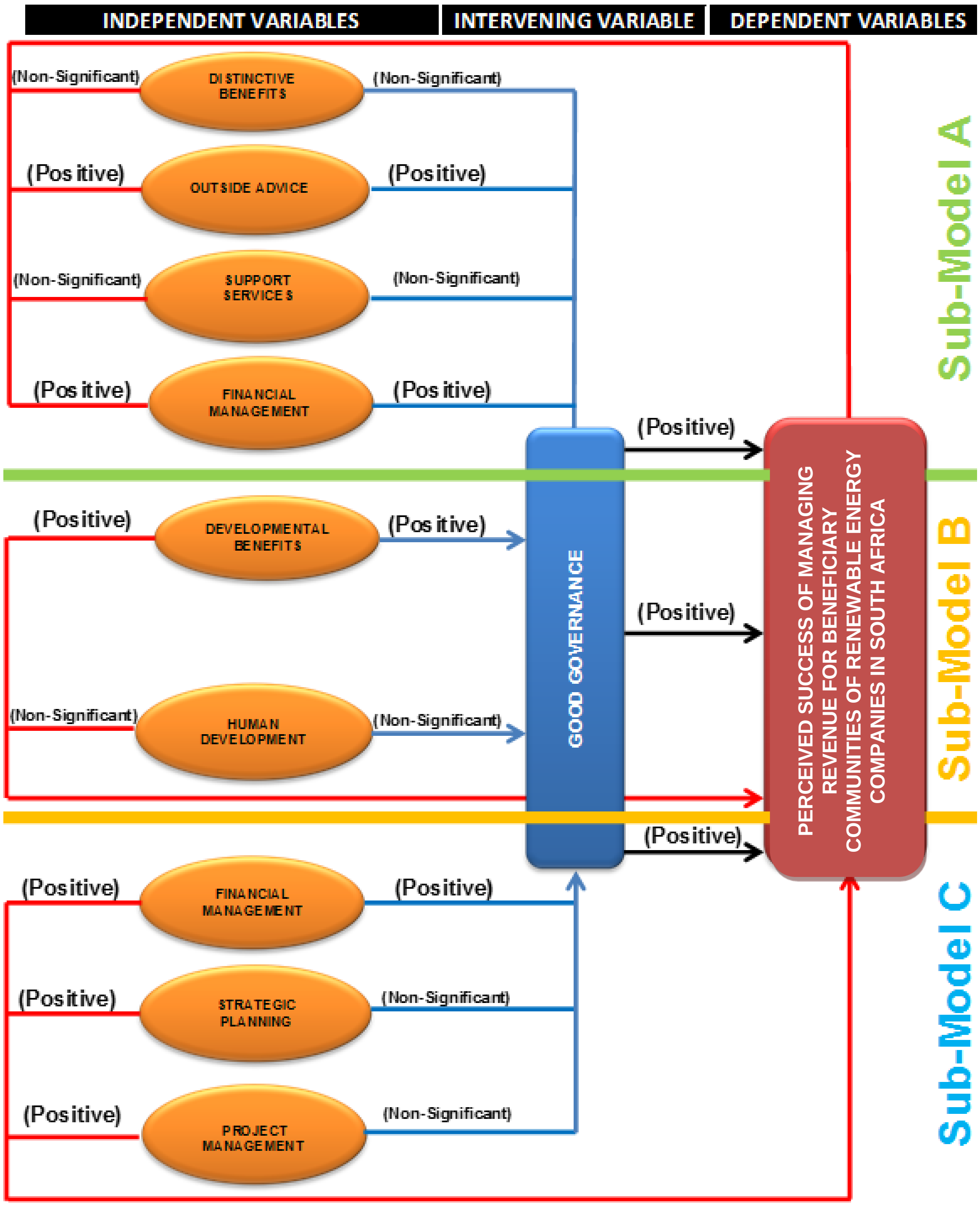
In order to test and develop the theoretical model, a positivistic research paradigm was used in this study. The positivistic paradigm is known alternatively as the quantitative, objectivist, scientific, experimentalist or traditionalist research paradigm (Collis & Hussey, 2003). A self-administered questionnaire is common to a positivistic research paradigm (Collis & Hussey 2003) and one was developed accordingly to source the primary data. Adjustments were made to the measuring instrument after it had been subjected to a pilot study and, thereafter, structured questionnaires were distributed to respondents identified by means of the convenience snowball sampling technique. The return of 219 fully completed questionnaires, which were used for the statistical analysis of the data, indicated the achievement of the fourth, secondary objective. The raw data were collated online on an Excel-based spreadsheet and then downloaded for analysis.

An exploratory factor analysis was conducted to assess the discriminant validity of the research instrument using the unique factors present in the data underlying the perceived success of management revenue for beneficiary communities. Two of the independent variables, included in the theoretical model proposed originally, were deleted as a result of this analysis. In two cases two variables (*outside advice* and *support services*) loaded together to form a new variable called *distinctive benefits* and another two variables (*education infrastructure development*) loaded together to form a new variable which was renamed *developmental benefits*.

To confirm the reliability of the measuring instrument used, the Cronbach's alpha co-efficient of each factor (latent variable) was calculated separately. Nine factors were identified during the exploratory factor analysis. The significance of the relationships hypothesised between variables/factors that influence good governance was then tested using the Structural Equation Modelling statistical technique.

The significant relationships, as identified in the study (Figure 7.1 below), including recommendations about how these determinants can be presented to ensure successful management of revenue for beneficiary communities renewable energy companies in South Africa, is discussed in the following section.

Figure 7.1: Factors that influence the success of management revenue for beneficiary communities of renewable energy companies in South Africa



Source: Researcher's own construction

7.4 Interpretations of the Empirical Results and Recommendations

The following section contains interpretations and recommendations based on all the factors found to have a significant influence on the dependent variable of the perceived success of managing revenue for beneficiary communities.

7.4.1 Distinctive benefits

The operationalisation of distinctive benefits for the purpose of this study refers to the use of the services of highly specialised outside consultants and experts in the field of community development that provide unique and community-specific benefits for the beneficiary communities, for example, language, culture and baseline knowledge of the specific areas needs and risks.

The empirical results showed that there was neither a significant relationship between distinctive benefits and the variable of good governance nor the dependent variable of perceived success of management revenue for beneficiary communities. The result contradicts the literature which stresses the importance of using specialists with in-depth knowledge of the specific beneficiary communities, especially in terms of language, culture, traditions, protocols, felt needs, etc. The non-significant result could be a consequence of respondents having had unsatisfactory experiences with consultants previously or a consequence of the relative newness of the renewable energy industry and the high cost of hiring consultants. Beneficiary communities have highly complex local community systems and many companies often lack the capacity and skills to engage successfully with them. Similarly, communities and community organisations have not been confronted before with the funding scenario presented by the renewable energy companies of a fairly steady flow of funding for the next twenty to twenty-five years for community development. This opportunity provides short-, medium- and long-term transformational and sustainability benefits for beneficiary communities and the more specialised knowledge that can be gained through specialists the more effectively this funding can be utilised.

7.4.2 Outside advice

The operationalisation of outside advice refers to specialist consultants who provide advice in the field of renewable energy and revenue management who have insight into the process of managing revenue to ensure sustainable and transformational socio-economic development in the beneficiary communities.

This study established that outside advice has a significant influence on the success of managing revenue for beneficiary communities. Many community development practitioners and renewable energy industry experts are of the opinion that utilising outside advice in the form of consultants, specialist and community practitioners before construction, during construction and during the implementation of community development projects in beneficiary communities is strongly recommended. Outside advice experts whose services can be utilised include lawyers, accountants, community development consultants, human resource specialists and community development practitioners. Many of the beneficiary communities are located in rural towns and villages and are made up of complex social and economic dynamics that influence these communities. This calls for specialised knowledge and skills to implement socio-economic development (SED), and economic development (ED), initiatives effectively.

From a company perspective, using outside advice enables a company to access specialised skills and experience which do not form part of the core business of a renewable energy company. It has been pointed out in the literature review that most renewable energy companies focus on predominantly technically based skills that are required during the construction, operation and maintenance phases of the renewable energy facilities. Most companies have been slow to respond to the SED and ED obligations and subsequently lack the capacity and expertise to manage the revenues for beneficiary communities. Advice on community profiling, project identification, project management (especially long-term and legacy projects), monitoring and evaluation, stakeholder engagement (including stakeholder mapping) can all be provided by outside advisers. Hohnen (2012), endorses the use of outside help, especially when engaging with multiple stakeholders (Hohnen, 2012). Deloitte also advocates the use of outside consultants for specialised work (Insight, 2015). It must be noted that, because the renewable energy industry is still new and many of the unique aspects of the SED, ED and Community Trust obligations have not been tried and tested, many consultants claiming to be able to provide sound advice on these issues have sprung up. Therefore, as the research has demonstrated, it is necessary to implement, proper good governance systems to ensure competency and decision making regarding the use of outside advice.

Conversely, from a community perspective, people who have lived in a community for a long time and have been disappointed by outside advisers, have an inherent distrust towards them and, therefore, are not in favour of using their services. Many communities have also realised that much of the skills that are needed in their communities are only available from outside the community. Beaulieu (2002) refers to leveraging outside resources to support local priority activities as do Frick *et al*. (2005) in their stakeholder engagement manual.

7.4.3 Support Services

For the purposes of this study, the operationalisation of support services refers to the level of assistance to renewable energy companies that will enable them to improve their management of revenue for beneficiary communities that goes beyond the capabilities of the company and its immediate service providers to successful socio-economic growth in the communities, thus including specialists in economic development, training, project and stakeholder management. Again, the empirical results showed that there was neither a significant relationship between support services and the variable of good governance nor the dependent variable of perceived success of managing revenue for beneficiary communities. This result also contradicts the literature which highlights the importance of using support services to develop communities. The respondents in the survey might not have completely understood the context of the type of support services that might be required for development in the beneficiary communities or may have confused it with service delivery, which is viewed as the responsibility of government. Similar to the response to distinctive benefits, support services provide specialised services that not only could meet the lack in the community but could be employed with the intention of transferring expertise and skills to the beneficiary community so that they are able to provide the services themselves eventually. Support services include elements of job-creation and the creation of an enabling environment for the local economy to grow and flourish. Support services involve strengthening the local economy, building local capacity and local social capital.

7.4.4 Financial Management

The operationalisation of financial management for the purpose of this study refers to the financial systems and processes employed to ensure sound financial management in RE companies which includes the management of revenue for beneficiary communities. The importance of effective financial management is overwhelmingly supported by a significant body of literature and the empirical results. The success of the company as a whole, including its socio-economic obligations, hinges on the implementation of internationally recognised principles of sound financial management. Financial management was found to be an important determinant of good governance and successful management of revenue for beneficiary communities. Kepner and Wysocki (2012,) stress the importance of financial management as being the responsibility of every manager in the business and that every manager must be a financial manager, including the SED and ED project managers (Kepner & Wysocki, 2012). Hill (2008) talks about financial management needing to be strategic.

The strict criteria relating to the spending of SED and ED funds that were imposed by the Department of Energy in RSA (DoE), demands the implementation of strict management systems. This obligation is underpinned by the possible consequences of not spending SED and ED funding, which include heavy penalties or having the licence to operate the renewable energy facility revoked. The implementation of strict financial management systems is also necessitated by the fact that the revenue generated derives directly from the source being exploited, be it wind, solar or other forms of renewable energy. Financial projections are therefore crucial in determining the potential amount of funding available for community projects and the type of projects that could be implemented. The main goal is to undertake projects that are both transformational and sustainable which is only possible with the implementation of effective financial management.

The empirical results confirmed the link between financial accountability and the success of managing revenue. Accountability is a vital component of good governance, especially in vulnerable beneficiary communities where unsatisfactory experiences in the past have left many communities with a high degree of mistrust. Effective financial management was modelled in both Sub-Model A (multi-sector participation) and Sub-Model C (sustainable initiatives) confirming that all the respondents consider financial management to be a high priority from a company and beneficiary community perspective. Even though the beneficiary communities are entitled to the funding for the life span of the renewable energy facility, it is important that the funding is managed effectively to ensure meaningful outcomes that can make a real and tangible difference in the lives of the beneficiaries.

7.4.5 Developmental benefits

For the purpose of this study developmental benefits were operationally defined as the benefits that the beneficiary community can derive from formal and informal education and training in the form of learnerships, mentorships, further education and training, educational support and resourcing as well as the development of physical systems such as buildings, transportation, communication, sewage, water and electricity that will improve their socio-economic circumstances.

This study has shown that education and infrastructure development are understood by the respondents as development benefits that can contribute to good governance and the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa. It must be noted that all five items that measured the original construct of education loaded together with all five items expected to measure the original construct of infrastructure development. This new construct was consequently renamed developmental benefits and redefined based on the results of the factor analysis. The study confirmed the definition of education as referring to formal and informal education as well as training in the form of learnerships, mentorships, further education and training, educational support and resourcing. The literature also supported the link between education and socio-economic development. This new construct is confirmed by Sandoval (2012), who believes that an investment in quality education is imperative to continue economic growth. According to researchers, there is increasing evidence that education has strong economic returns and constitutes a major source of development (Sandoval, 2012). The historical context of education in South Africa has had a major impact on beneficiary communities who see it as a means of escaping poverty and unemployment. Ward (2007) believes that poor people who live in the countryside realise that education offers an escape from poverty – but only if the economic environment in the society at large and the quality of education improves. Sandoval (2012) refers to policy research paper for the World Bank by Hanushek and Wößmann, who explored the link between quality of education and economic growth According to the analysis, policies that attempt to improve education systems in developing nations have significant economic returns, and long-term reforms to education will increase the Gross Domestic Product (GDP) of a country substantially compared with education in countries that make no changes (Sandoval, 2012). Therefore, it can be concluded that this study is consistent with the literature on the link between education and economic growth, poverty alleviation and unemployment.

Researchers Acker and Gasperini (2009) draw the link between infrastructure development and education for rural people. Acker and Gasperini (2009) state that the essential assets enabling rural households to escape poverty are education, labour, land, livestock and infrastructure. Gardner (2008) states that the physical and service infrastructure of many farm and rural schools in South Africa needs to be upgraded to ensure minimum standards of provision including water, toilets, electricity, library books, office equipment, and sports facilities. Gardner (2008), therefore, further substantiates the findings in this study on the link between education and infrastructure development. Cavaye (2001) points out that adequate infrastructure is needed to support economic activity and community life. However, the link between education and infrastructure development needs to be explored in more detail as beneficiary communities also view infrastructure development in the community as a source of employment, improving their quality of life and combating some of the prevailing social evils (Dolata, 2013). The combining of the variables, education and infrastructure development, into a single determinant of developmental benefits is therefore consistent with the reviewed literature and the findings of this study.

7.4.6 Human Development

The operationalisation of human development refers to the increase of both capabilities and opportunities. These should ensure successful management of revenue for beneficiary communities and improve the quality of life and life expectancy of community members in beneficiary communities. Human development contributes to the formation of human capabilities, such as improved health, knowledge and skills, and the use people make of their acquired capabilities for leisure, productive purposes or being active in cultural, social and political affairs within beneficiary communities. The empirical results revealed that there was neither a significant relationship between human development and good governance nor the perceived success of managing revenue for beneficiary communities. This result is inconsistent with the literature, which places a strong emphasis on human development, especially in rural communities. Once again, the respondents might not have made the link between human development and good governance within the context of community development. Unless a comparison is made between human development in an urban context with human development in a rural context, especially given the historical background of RSA in a post-apartheid democracy, the deficiencies of human development will not be fully understood. Good governance measures should be directed towards ensuring that human development goals are realised and maintained. It is essential to align managing revenue with the Millennium Development Goals. Transformational change can only take place effectively if the deficiencies of human development are addressed and resolved as a matter of priority in beneficiary communities. This in turn will promote successful management of revenue.

7.4.7 Project Management

The operationalisation of project management refers to all the processes employed by RE companies to achieving SED and ED project objectives (schedule, budget and performance) through a set of activities that start and end at certain points in time and produce quantifiable and qualified deliverables for successful management of revenue for beneficiary communities in the short-, medium- and long-term. The fact that all five items loaded on the project management factor as expected is consistent with the literature on the importance of proper management of projects in beneficiary communities. Key words drawn from the items such as revenue management, management skills, quality standards and reducing risks are consistent with the literature on project management in socio-economic development. The Project Management Institute references all these terms in their literature on the essential components of project management (PMI, 2013). According to industry experts, project management within the renewable energy sector comes with its own unique challenges and opportunities. It is acknowledged that enhanced capacity within local, provincial and even National Government is critical in comprehending the possibilities and challenges associated with the REIPPP Programme appropriately and developing strategies to support IPPs and local communities (Wlokas, Boyd & Andolfi, 2012).

In order to address these challenges the necessary training, technology and physical resources need to be incorporated and deployed. Appropriate capacity building to deal with SED and ED obligations needs to be developed internally, or outsourced, to appropriately skilled and experienced practitioners and/or organisations. If the renewable energy company chooses to manage its own projects, provision must be made for adequate staffing with suitable skills and training or to employ additional staff with these essential skills. A combination of CSR and social development experience is preferred. In addition to job-related training, such as stakeholder management, community liaison, project management, risk management, communication, etc. should be provided to staff.

However, developing capacity should not only be restricted to the RE company. It needs to be realised that impoverished communities gain the maximum benefit when spending not only includes social programs, but also funding for remuneration, training for rural artisans, and creation of local project management capacity (Hemson *et al.*, 2004). The empirical evidence of this study demonstrates that transfer of project management skills to people in the communities must be an integrated part of the project management approach so that beneficiary communities can eventually manage their own community development.

7.4.8 Strategic Planning

The operationalisation of strategic planning refers to the formulation of achievable policy objectives for future growth and development of an organisation over a period of years, based on its mission and goals and on a realistic assessment of the available human and material resources to implement the plan that will lead to the success of managing revenue for beneficiary communities. Strategic planning enables RE companies to incorporate long-term SED and ED initiatives that will have both a socio-economic and transformational outcome for the beneficiary communities. Even though the empirical results revealed that there was not a significant relationship between the implementation of strategic planning and good governance, there was a significant relationship between strategic planning and the perceived success of managing revenue for beneficiary communities. There is overwhelming evidence in the literature linking effective strategic planning to both good governance and successful management of revenue. From the perspective of the RE company, Crowther and Aras (2008) believe that, when a corporation acts responsibly, ethically and socially, in its business decisions and strategic planning, that corporation will be more sustainable. Crowther and Aras (2008) stipulate further that an important part of strategic planning is to ensure that the organisation is structured in such a way that the plan can be achieved, and that the control systems of the RE company provide appropriate feedback to managers. This feedback is necessary in order to ensure that managers are able to measure performance against the plan and take corrective action as required (Crowther & Aras, 2008). It can therefore be argued that effective strategic planning can indeed have a positive effect on good governance. The King III Report states that integrating sustainability and social transformation in a strategic and coherent manner will give rise to greater opportunities, efficiencies, and benefits for both the RE company and society (PwC, 2009). According to Crowther and Aras (2008), corporate social responsibility is now generally considered to be an integral part of strategy for any organisation and is therefore built into the strategic planning process. Furthermore, Crowther and Aras

(2008) point out that there are many perceived benefits to an organisation from corporate social responsibility, especially good governance (Crowther & Aras, 2008).

7.4.9 Good Governance

The operationalisation of good governance refers to the influence of good governance practices and their relationship with the identified variables and the perceived success of managing revenue for beneficiary communities in RSA, which includes good governance infrastructure, processes, policies, systems and procedures. The empirical results prove that good governance is an important determinant to ensure successful of revenue for beneficiary communities. Good governance refers to the measures and systems that, when implemented by organisations managing revenues for community development, can improve the success rate of projects in beneficiary communities significantly. It is important that good governance structures are integrated into the overall corporate governance practices of the RE company. Industry experts who participated in the study were of the opinion that companies needed to have a good governance committee that would ensure that the social commitments of RE companies were managed effectively and ethically. Much of the literature about corporate social responsibility, such as King I, II and III Reports (RSA), support the establishment of a good governance committee, such as a Social and Ethics Committee (SEC), within RE companies. Large companies such as Deloitte, the Ethics Institute of South Africa, and the Department of Trade and Industry (RSA) have gone to great lengths to encourage companies to establish SECs. In fact, Section 72 of the Companies Act stipulates that the "Minister may, by regulation, prescribe that a company or a category of companies must have a social and ethics committee" (Rossouw, 2012:1). In terms of Regulation 26 of the Companies Act, it is applicable to all state owned companies, listed public companies, and other companies that score above 500 public interest points.

The finding of this study confirms the link between effective financial management and good governance, and that good governance systems should be employed in all aspects of the company including, amongst others, the use of outside advice, community development and project management. The incorporation of good governance systems and processes, according to both industry experts and community development practitioners, will ensure that the management of revenue for beneficiary communities meets the highest social and ethical standards. The large amount of funds that will be made available for community development could attract fraudulent and corrupt activities. It is therefore important that documents such as the social and ethics charter and company policy documents form part of good governance and directly address the issue of potential fraud and corruption in managing revenue for beneficiary communities.

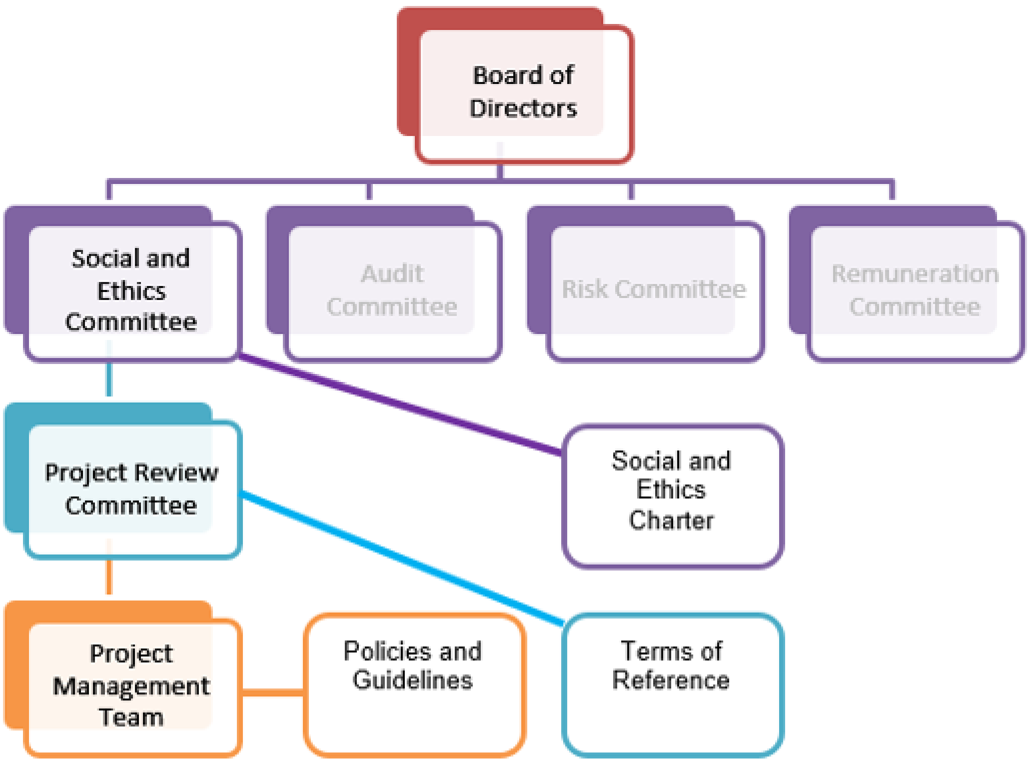
7.5 The Perceived Success of Managing Revenue for Beneficiary Communities of Renewable Energy Companies in South Africa

Seven primary determinants of the perceived success of managing revenue for beneficiary communities have been discussed, of which four determinants combined into two new determinants. It must be noted that the intervening variable, good governance, is linked to all the positive determinants to ensure the success of managing revenue. The outcome of the good governance items in the measuring instrument could also improve the management revenue by:

- Being incorporated in all aspects of the company's business activities.
- Building trust between the company and the beneficiary communities.
- Improving the relationship between the company and beneficiary communities.
- Ensuring that the company acts with integrity when involved in community development projects.
- Combating potential fraud and corruption in revenue management activities.

It has been established by this study that, through the integration of good governance practices and systems in all aspects of managing revenue for beneficiary communities, successful project outcomes, which can be both transformational and sustainable, can be improved significantly. It is incumbent on the Board of Directors of RE companies to establish sub-communities within the company to have oversight of SED, ED and community trust revenues and initiatives specifically. A number of good governance structures have been explored in this study including the establishment of a Social and Ethics Committee (SEC) as well as a Project Review Committee (PRC). These governance structures are subject to their own set of procedures (the SEC Charter) and terms of reference (the PRC), and various company policy documents relating to SED and ED. Figure 7.2. is an example of a governance structure that could oversee the management of revenue for beneficiary communities within an RE company.

Figure 7.2: Example of a company governance structure



Source: Researchers' own construction

RE Companies need to decide whether they will provide internal SED and ED management or outsource it to an external service provider or both. The decision about whether to create an internal "community operations" division could be determined by the number of RE energy sites that the company has and the total number of beneficiary communities surrounding these sites. The advantages of having an internal community operations management team is that better oversight and control measures can be implemented (this includes a better co-ordinated relationship with the community trusts especially). Strategic partnerships can also be formed with other stakeholders including neighbouring IPPs, local government and district or regional agencies. It needs to be borne in mind that creating a community operations division in the company will require capacity and training specific to SED and ED for beneficiary communities in the renewable energy sector.

This study has also established that making use of outside advice in the form of consultants, specialists and experts in all aspects of revenue management is an essential part of ensuring that projects are successful. The literature revealed that outside advice provides specialist skills and experience that do not form part of the core business processes of the renewable energy company. In some instances, companies have opted to employ staff with some of the necessary skills but, as far as SED and ED are concerned, more and more companies are realising that, because of its complexity and inherent risks, specialised knowledge is required. More research needs to done into the unique nature of SED and ED within the renewable energy sector and comparative experiences in the mining industry. There is a plethora of business consultants that are willing to provide advice to RE Companies and Figure &.3 below provides some insight into what needs to be considered when seeking outside advice.

Figure 7.3: Outside advisers

Source: Researcher's own construction

Outside advice is important given the relative newness of the renewable energy sector that is approximately 4 years old in RSA. This situation is exacerbated by the uniqueness of the REIPPP Programme, especially the inclusion of SED, ED and community shareholding in the form of community trusts, as revealed in the literature. It is because of the newness of the RE industry that a number of outside advisers and service providers have rapidly appeared claiming to be able to manage SED and ED revenues for beneficiary communities successfully. The risk posed by inexperienced consultant could cause more harm than good in beneficiary communities that are very often vulnerable. It is clear from the literature that not much thought has gone into the long-term effects of poorly managed SED and ED projects. It is, therefore, imperative that good governance systems be integrated into the appointment of knowledgeable and experienced specialists to minimise risk and ensure successful outcomes.

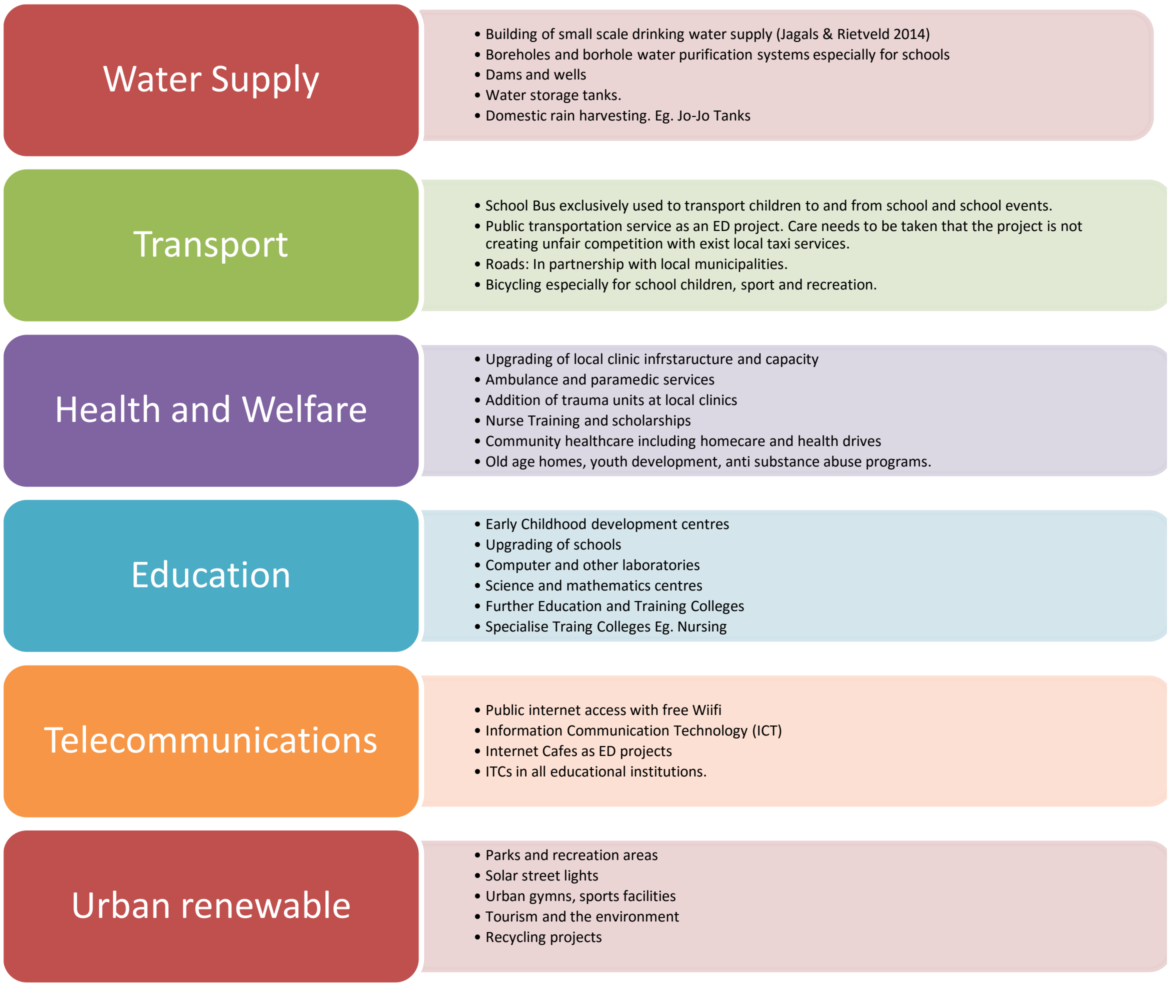
From the evidence, the use of support services is essential and the following diagram summarises the types of support services that can assist in ensuring successful revenue management for beneficiary communities.

Figure 7.4: Examples of support services

Source: Researcher's own construction

It is clear from the literature that the inclusion of SED and ED in the agreement between the DoE and IPPs required RE companies to go beyond allocating funds to beneficiary communities. This makes the findings regarding education and infrastructure development, seen together as developmental benefits, in this study particularly relevant. Job creation, which often results from infrastructure development projects, is a central component of the economic development drivers of the RSA Government in the form of programmes that create sustainable access to the economy for beneficiaries (DTI, 2012). Figure 7.5 lists a number of infrastructure projects in beneficiary communities that show the link between education and infrastructure development (Jagals & Rietveld, 2014).

Figure 7.5: Examples of infrastructure development



Source: Researcher's own construction

The importance of baseline assets and needs assessments has been highlighted in the literature review as a prerequisite to initiating SED and ED projects in beneficiary communities. However, input from industry experts and community development practitioners indicates that there is a shortage of experienced and skilled service providers that are able to provide appropriate and meaningful base-line assessments. Well-researched baseline assessments enable companies, in partnership with communities, to forecast potential scenarios that will inform possible interventions and initiatives better. The value of forecasting, as an integral part of community assessment needs to be researched further, especially given the dramatic consequences of failed SED and ED initiatives in the past. The literature also revealed that the lack of co-ordination between IPPs doing baseline assessments in the same areas has had a negative effect on beneficiary communities. Baseline assessments tend to create expectations and multiple baseline assessments done in the same communities often lead to community fatigue.

The need for effective financial management has permeated the research on the side of both the RE companies as the funders, and the recipient NGOs in the communities. Projected figures for SED, ED and funding for community trusts enables companies, to a large extent, to forecast the amount of revenue flows. The ability to forecast revenues should enable companies to plan ahead strategically and ensure that short-, medium- and long-term projects are undertaken. Baseline assessments of beneficiary communities can assist with identifying the priority needs of the community in the short-, medium- and long-term. Financial models of forecasted income from revenue, over the twenty-year life span of the project, derived from the sale of electricity generated by the RE facility, can assist effective strategic planning. There needs to be a close working relationship between the financial and project managers to ensure that strategy implementation is adhered to and that targets and obligations are met. Monitoring and control will require scheduled updates on SED and ED expenditure and the RE companies can employ a number of best practices for this purpose. Table 7.1 below illustrates some examples of SED spend over the twenty-year period.

Table 7.1: Example of SED spend over the twenty-year lifespan of the RE facility

Categories	Key focus areas	Short Term 1-5 years.	Medium Term 5–10 years.	Long Term 10 – 20 years
Education	Early childhood development, primary and high school phase, adult basic education and training, capacity building for community based organisations. Further education and training – employability.	✓	✓	
Welfare	Care of the aged, child welfare, community services, feeding schemes, youth development, local social challenges, etc.	✓	✓	
Health	Community health, drug and other	✓	✓	

	addictions, physical disabilities, wellness and health awareness, sports development, etc.			
Environment	Community development, crime, research and surveys, housing, nature conservation, urban renewal/regeneration, waste management including recycling, wildlife preservation, etc.	✓	✓	
Legacy	Training centres, colleges, satellite universities, leadership and agricultural academies, Co-operatives, etc.	✓	✓	✓
Source: Researchers own construction				

The influential impact of effective project management in the empirical results cannot be underestimated since it touches on all the other determinants. A close study of the literature, especially research by Talluri, van Ryzin, Karaesmen and Vulcano (2008), has made it possible to propose a case study of internal project management (see Section 7.8.), encompassing all factors relating to managing revenue for beneficiary communities.

7.6 Limitations of this Study

Even though the intention of the present study was to make a valuable contribution to the body of knowledge concerning the management of revenue for beneficiary communities, certain limitations must be borne in mind when interpreting the results and drawing conclusions about the findings. The proposed model has led to a better understanding of the determinants that influence the success of managing revenue for beneficiary communities on the one hand but, on the other hand, has also opened up new avenues of research into this subject. The following limitations are therefore pointed out for consideration for further research of this nature.

- The use of the snowball-sampling technique is inherently limiting because it does not necessarily lead to a representative sample of the population. The implementation of snowball sampling was particularly challenging at the beginning of the study and relied on existing knowledge and very limited personal contact lists. Non-probability sampling introduces an element of bias into the study because respondents might not be particularly familiar with the unique criteria for revenue management being investigated by the study. The fact that, out of the 219 respondents, only 53% were from the renewable energy sector illustrates this point. However, the study did provide significant insights into the dynamics of managing revenue for beneficiary communities successfully. It is, however, recommended that any research on this topic in the future should endeavour to develop a more comprehensive database from which probability samples can be drawn.

- The research relied on an online questionnaire which respondents accessed using the internet. This means of data collection required respondents to access the questionnaire through a link to a website and, because these questionnaires were essentially unsolicited, they may have been considered offensive or intimidating. This situation could have been aggravated by the questionnaire competing with the large quantity of online research questionnaires being sent daily to potential respondents. Also, once the questionnaire was accessed, its successful completion relied on a number of factors such as: the respondent's motive to participate in the research, the extent of the respondent's knowledge of the subject matter and the ability of the respondent to express their views using the options provided (7-point Likert-type interval scale).
- The design of the study was aimed at providing an understanding of managing revenue for beneficiary communities through the experiences of individuals in the field of renewable energy and community development which, together, are relatively new in RSA. Although finding respondents from both the renewable energy sector and community development presented a challenge in terms of numbers of individuals that responded to the questionnaire, 78% of the respondents were from South Africa but only 24% were from both the RE and community development sectors. This challenge, however, did not have a significantly negative impact on the outcome of the study.

Several procedures were implemented to address and manage the above concerns, such as the assistance of renewable energy association databases through the various agencies. The questionnaire also ensured full confidentiality and no personal details such as names and addresses were required. The questionnaire was posted on the official Nelson Mandela Metropolitan University survey site which added to the credibility of the study. The questionnaire also provided definitions for key words used in the questionnaire to assist respondents in the general understanding of some of the subject matter. The results of the questionnaire were downloadable in the form of an Excel spreadsheet which could be directly uploaded into the software that was used for the data analysis. The integrity of the data was thereby ensured.

7.7 The Contributions of this Study, Recommendations for Future Research and a Case Study of an Approach to Managing Revenue for Beneficiary Communities

The most significant contributions of this study were discussed in the findings in Sections 7.3. and 7.4. A summary of additional recommendations follows in the sections below.

7.7.1 Recommendation A

- The study has revealed a deeper perspective on managing revenue for beneficiary communities. The constructs covered by the empirical research – factors that influence the perceived success of managing revenue for beneficiary communities in the renewable energy sector in RSA – were unexplored prior to this study. As far as could be ascertained, no such research study has been produced internationally or nationally for the renewable energy sector. The research on management revenue not only serves as a credible model that can be implemented by the renewable energy industry, but also acts as a basis for further study in the area of management revenue for and by beneficiary communities.
- Comparative research could be conducted in other industries such as the extraction industry. Many of the legal obligations found in the renewable

energy sector are prevalent in the extraction industry in RSA. Extensive literature is available on economic development within the extraction industry that can be applied to other industries, especially in the light of the recent events concerning community beneficiation.

- Research methodology was developed for each of the variables in the theoretical model that was unique to this study. The reliability and validity of the majority of the variables proposed in the model were substantiated by the study. The research instrument demonstrated significant reliability and validity indicated by the high Cronbach's alpha co-efficients, and can therefore be used in future studies.
- The study provided new insight into managing revenue for beneficiary communities in RSA. With the renewable energy sector being one of the fastest growing sectors in RSA, and the RSA Government being determined to link the location of renewable energy facilities to economic development, this research has given new insight into managing revenue for SED and ED. The objectives of multi-sector participation, transformational change and sustainable initiatives for beneficiary communities could ensure that greater consideration and care are taken when managing revenue for beneficiaries. The opportunity presented by the RE industry can, therefore, change these communities dramatically for the better.
- The research also highlights the lack of detail provided by the various agreements between the government and the independent power producers on the issue of SED and ED. Seen in a positive light, this impasse presents a unique opportunity for the RE sector to propose innovative solutions to SED and ED initiatives in beneficiary communities. Already, individual companies are "getting it right" to some extent while others are struggling. This study has created a probable and credible platform for a unified approach to managing revenue for beneficiary communities in RSA.

7.7.2 Recommendation B

As a result of the relatively small sample size relative to the complexity of the theoretical model, the entire matrix of responses in this study could not be subjected to a single exploratory factor analysis. Therefore, the model was split into three sub-models: Sub-Model A (Multi-sector participation), Sub-Model B (Transformational change) and Sub-Model C (Sustainability initiatives). The following recommendations are based on the respective sub-models:

- **Sub-Model A: Multi-Sector Participation**
  The independent variables associated with this sub-model include: distinctive benefits, support services, outside advice and financial management, and the intervening variable of good governance, alluding to an approach of multi-sector participation in managing revenue for beneficiary communities. Multi-sector refers to the involvement of government, the private sector and civil society. Participation refers to the leveraging of knowledge and skills; the accessing of expertise, the forming of partnerships and the accessing of resources. The spirit of Ubuntu, expressed as "I am because of others" must be deliberately and actively embraced and put into practice (Mkhize, 2008: 40). It must be noted that financial management and good governance are important components of the sub-model and should be treated as such. The literature reviewed in Chapter 3 discussed the link between corporate social responsibility and revenue management and therefore confirms the importance of multi-sector participation. The Sigma management model refers to a multi-stakeholder project to provide practical, yet comprehensive guidance to organisations wanting to improve their CSR management, performance and sustainability. This approach is further endorsed by the Guangcai Model approach which promotes multi-sector co-operation between entrepreneurs, governments and non-governmental organisations. The model used by the Holcim Group of companies deals with preparing, implementing and evaluating local stakeholder engagement strategies. The Holcim Group Model details, step-by-step, the cyclical process of engaging with stakeholders, and each step contains basic principles, tools and mechanisms

to apply, which enable practitioners to engage with stakeholders, covering a diverse spectrum of cultures, languages, and aspirations (Jonker & De Witte, 2006).

Multi sector participants should include the following:

- **Local government**: Integrated Development Plan
- **Provincial government:** Provincial Strategic Plan
- **National government**: National Development Plan
- **Private Sector:** IPPs, Service Providers, Consultants, etc.
- **Community-based organisations:** NPOs, Community forums, etc.
- **Academic institutions:** Universities, Technical colleges, etc.

The role of the intervening variable, good governance, must form an integral part of this sub-model to ensure that multi-sector participation includes and assists the beneficiary community at all times and in every situation. Good governance principles can be included in activities such as:

- The appointment of industry experts and service providers.
- The form of multi-sector partnerships or collaboration.
- The management of finance and financial transactions
- The monitoring, evaluation and reporting of all activities.
- The inclusion of policies and procedures in all management processes.

- **Sub-Model B: Transformational Change**

  The independent variables associated with this sub-model include developmental benefits and human development, and the intervening variable of good governance, alluding to a transformational approach to managing revenue for beneficiary communities. Change without transformation is simply window-dressing. Transformation is about: changing the way people view themselves – their self-potential; how people view others around them – their collective potential; and how people view the world around them (including the natural environment) – our sustainable potential. Transformation involves education, social interaction, social cohesion, infrastructure improvement and sharing. Therefore, every kind of participation referred to in Sub-Model A (multi-sector participation) must complement Sub-Model B and have a deliberate component of knowledge (education) and skills transfer so that beneficiary communities can take ownership of, and be responsible for, their own growth and development. There has to be greater participation on the part of government and the IPPs in ensuring that outcomes for the beneficiary communities are transformational in nature. Once again, corresponding with Sub-Model A, the role of the intervening variable, good governance, must form an integral part of Sub-Model B to ensure that transformational change benefits the beneficiary community at all times and in every possible way.

This includes activities such as:

- Addressing human development needs as a priority.
- Baseline knowledge of, and insight into, the educational and infrastructural needs of the beneficiary communities (including engagement with the community at grassroots level).
- Scenario forecasting – possible futures.
- The appointment of internal and external service providers.
- The formation of possible PPPs or collaboration with other IPPs.
- The management of finances and financial transactions.
- The monitoring, evaluation and reporting of all activities.
- The inclusion of policies and procedures in all management processes.

- **Sub-Model C: Sustainable Initiatives**

  The independent variables associated with this sub-model include financial management, strategic planning and project management, and the intervening variable of good governance, alluding to the desire to ensure that the management of revenue for beneficiary communities results in sustainability. Sustainability is about ensuring that the community projects that are started will continue to deliver good results far into the future and certainly beyond the life span of the renewal energy facility for generations to come. Revenue management must have a forward-thinking approach to community development. Sustainability has to be the key driver, or the opportunity presented by the renewable energy sector may cause more harm than good. As argued in this study, the immediate and pressing conditions in beneficiary communities must be addressed but, in doing so, a situation of creating dependency must be avoided at all cost. Strategic planning, project management and sound financial management will be fundamental to ensuring a measure of self-sufficiency and sustainability. Sub-Models A and B must complement Sub-Model C to ensure that sustainable initiatives include, and benefit, the beneficiary community at all times and in every possible way.

This includes activities such as:

- Baseline knowledge and insight of the needs, assets and opportunities in the beneficiary communities (asset mapping and needs analysis and the local governments' Integrated Development Plans).
- Scenario forecasting.
- The appointment of support service providers to offer support and ensure sustainability.
- The promoting of collaborative and co-operative relationships with other stakeholders, especially local government and neighbouring IPPs.
- The long-term planning and management of revenue expenditure.
- A determined and deliberate move towards community-driven development.
- Greater input and motivation from government (IPP Office), in monitoring, evaluation and reporting of all projects, including the implementation of long-term or legacy projects.
- Pro-active encouragement from government on practical revenue management systems for beneficiary communities that promote sustainability.
- The inclusion of good governance structures, policies and procedures in all management processes.

7.8 Case Study of an Approach to Managing Revenue for Beneficiary Communities

By deconstructing Talluri's definition of revenue and project management, all the empirical results in the current study can be incorporated into a possible, internally managed, approach to managing revenue for beneficiary communities that can be applied by RE companies (Talluri *et al.*, 2008). Talluri *et al.*(2008) advocated that revenue management necessitates the inclusion of the following economic elements to ensure a positive outcome for beneficiary communities:

- Demand
- Decision making
- Methodology
- Systems (control systems)
- Interface with the market (including stakeholder engagement)
- Objectives

A re-application of the elements listed above will enable renewable energy companies to understand and manage successful management of revenue for beneficiary communities better. This approach is particularly attractive because it relates directly to general business management processes.

7.8.1 Demand

In relation to revenue management for beneficiary communities, the term "demand" cannot be applied in the same context as it would be when referring to a for-profit company because the beneficiaries are not paying customers. The available revenue is an obligation that forms part of the Implementation Agreement that the RE company has with the DoE and should rather be described as an obligation or requirement which must be met. The danger, however, is that the beneficiary communities can view this obligation as an expectation or an entitlement, which puts pressure on the renewable energy companies to provide the funds unconditionally. Additionally, the goods and services (demand) provided to the beneficiary communities are in the in the form of SED and ED initiatives. Thus, the question is how this demand/expectancy or entitlement can be supported along similar revenue management principles as that of paying customers to maintain both the relational and quality aspect of the interaction. IN this context, the process of identifying, categorising, prioritising and then implementing or supplying the demand as found in for-profit situations, can also be applied to managing revenue for beneficiary communities.

As explained earlier in this study, failure to spend SED and ED funding can result in penalties for the RE company. Furthermore, the DoE is conducting an audit on SED and ED projects funded by the renewable energy companies to assess the impact that the projects have had on the beneficiary communities.

One of the methods used to enable community participation and to establish "demand" is known as asset mapping and needs assessments where communities, including local government, are involved in determining the felt needs of a community and the extent of the asset resources they have to meet that need. Asset mapping is a tool that may be used for developing a community "from the inside out" by means of identifying and mobilising community assets (Kretzmann & McKnight, 1993). Asset mapping is an important strategy for community development because it seeks to uncover and expand the knowledge and skills of people in the community. (Beaulieu, 2002:5). Asset mapping supports the sustainable development of communities by strengthening community-based assets and the networks between community actors (Du Plessis, Heinecken & Olivier, 2012). Communities thereby become the primary drivers of their own development (Du Plessis *et al.*, 2012). In this way the use of industry experts, outside advice and support services is involved. This ensures a measure of ownership and buy-in from beneficiary communities that, in turn, results in a greater propensity of the beneficiary community to succeed.

7.8.2 Decision making

It is clear from the literature that community participation in identifying community development initiatives is crucial and must become more and more acceptable as standard practice. The utilisation of non-professionals through citizen involvement mechanisms to address social problems has become more commonplace (Kaufman & Poulin, 2006). The International Association for Public Participation (IAPP) believes that public participation is based on the belief that those who are affected by a decision have a right to be involved in the decision-making process (Krick *et al.*, 2005). According to the IAPP, Public participation is the process by which an organisation consults with interested or affected individuals, organisations, and government entities before making a decision (Krick *et al.*, 2005). Public participation is two-way communication and collaborative problem solving with the goal of achieving better and more acceptable decisions (Krick *et al.*, 2005). Decision making, though informed by a public participation process, must take into account the obligations to meet the SED and ED spending requirements of the DoE. However, the process that is undertaken before one arrives at the final decision is worth examining. The elements that contribute to the final decision of whether to fund a particular project include community participation, available information on the economic context of the communities, as well as engagement with other stakeholders such as the local government and neighbouring IPPs who have the same obligation towards the beneficiary communities. Making a decision implies that there are alternative choices to be considered and, in such a case, it is desirable to identify as many of these alternatives as possible before choosing the one that best fits identified goals, objectives, desires, and values (Harris,1980). Consequently, the first step in the decision-making process is to identify the decision makers and stakeholders in the decision, reducing the possible disagreement about problem definition, requirements, goals and criteria (Al-Tarawneh, 2011). The primary decision maker, in this case, will always be the renewable energy company because of its obligation (this approach will change once the beneficiary community is enabled and empowered to make its own decisions). The next step is to identify and categorise all the stakeholders and the extent to which stakeholders can influence decision making. Multi-sector participation in this step is crucial. The primary stakeholder will most likely be the beneficiary community followed by secondary stakeholders such as local government, business forums, community-based organisations and possibly other influential individuals and groups in the beneficiary community. Understanding and finding the balance in stakeholder engagement is the key to effective decision making. Very often, simply listening to the beneficiaries speak of their own concerns and needs is enough to begin the process of sound decision making.

7.8.3 Methodology

The renewable energy companies can apply a number of general revenue management methodologies discussed in this research study. However, the SED and ED obligations that govern the use of revenue for beneficiary communities are what make revenue management unique in the renewable energy sector. Renewable energy companies have explored a number of methodologies for spending revenue in beneficiary communities including:

- Running several, small projects: these are managed simultaneously over a number of quarterly periods. In this approach, renewable energy companies fund existing community-based organisations (CBOs), which apply for funding through a funding application process. These CBOs address a number of existing needs in the communities such as feeding schemes, community development initiatives, child welfare, the aged, people with disabilities, etc. The risk with this approach is always that, unless there is a clear exit strategy, it may result in dependency on the funding. Another risk is that many CBOs themselves are often in survivalist mode and do not give much attention to potential health and safety issues. Additionally, the buildings occupied by the CBOs are often dilapidated, under resourced and under staffed. Furthermore, many of the CBOs are not registered with the Directorate of Non-profit Organisations in the Department of Social Development (DSD), which issues NPO Certificates and, consequently, do not have good governance structures in place. All these factors pose inherent risks for effective revenue management such as accountability, proper accounting processes and record keeping, strategic financial management and even double and triple dipping. Double and triple dipping occurs when an organisation applies for funding from more than one funder for the same programme without the knowledge of any of the individual funders. Most CBOs also do not have long-term plans for their community intervention programmes.

- Large-scale projects: otherwise referred to as “flagship” projects, are often the preferred method of spending because they provide a steady flow of funding into a project category over an extended period, for example, 2-3 years or even longer. The key to choosing successful flagship projects is a multi-level engagement with the target community including: local IDP, social dialogue, direct community engagement and interaction. Some of the preferable categories in which to identify flagship projects are education, healthcare and infrastructure development. These are still priority needs in most of the beneficiary communities linked to the renewable energy sector. When choosing a flagship project, such as education, it is important to adopt a multi-sector participation approach as described in this study.
- Large infrastructure projects: These are often undertaken in partnership with other funders and stakeholders in the same area, especially local government. The implementation of large infrastructure projects requires careful and systematic planning. It might take a significant amount of time before the project starts and eventually achieves its ultimate goal. Initial planning, procurement, skills development and job creation, which all form part of large infrastructure projects, must also be incorporated so that they benefit the beneficiary community. It is vitally important that the beneficiary community owns the project from the start through engagement and active participation in decision-making and the planning. A number of community-driven project models, which can assist with getting buy-in and ownership from the beneficiary community, are suggested in this study. Effective revenue management must be the key driver of any participatory community development to ensure that the project meets acceptable standards of quality, achieved within set timelines and the planned budget.

7.8.4 Systems (controls)

A model for managing revenue successfully must have effective control systems in place for the full duration of the relationship between the renewable energy company and the beneficiary community. In the commercial world, the objective is to maximise profit. In community development, it is to maximise the amount of revenue that is utilized for actual initiatives. Currently, the obligations from the DoE predetermine the amount of spending. The projected spend is determined through modelling based on the forecast availability of renewable energy over the 20-year lifespan of the RE facility. Although there might be fluctuations in annual production as a result of altering weather patterns, operation and maintenance downtime or other unforeseen circumstances, it is rational to infer that the revenue for beneficiary communities will continue throughout the life span of the facility. However, the amount of revenue does have a direct effect on the control systems that are implemented, maintained and updated annually to match prevailing conditions or to mitigate risks. System controls might therefore include the following:

- Revenue management policies.
- Revenue management processes such as:
  - Funding applications forms.
  - Due diligence reports.
  - Risk management.
  - Project proposal fact sheets.
  - Funding agreements between the company and the beneficiary community.
  - Contracts between service providers and the company and/or community.
  - Project oversight and management.
  - Monitoring, evaluation and reporting.
  - Impact assessment and review.
- Good Governance:
  - Project Review Committees.
  - Social and Ethics Committees.
  - Board of Directors.
  - Revenue control and sign-off through an approvals matrix process.
  - Interface with the market (beneficiary community).

7.8.5 Interface with the Market (Beneficiary Community)

The focus of this economic element is on the interface with the beneficiary community as the “market”. This means that many of the fundamentals of marketing apply to the manner in which renewable energy companies interface with beneficiary communities.

7.8.5.1 *Understanding and* **d***ifferentiating between the* **C***ommunity’s* **N***eeds and* **W***ants.*

The “marketplace” or beneficiary communities range from urban to rural with significant differences in socio-economic and enterprise development needs. Beneficiary communities are also complex micro-societies with political, tribal, clan, language and other challenges that further complicate efforts to understand the community’s needs and wants. It is often advisable to recruit the services of an outside service provider to assess the assets, needs and possible opportunities of each beneficiary community. As explained in this study, the process of assessing the needs of a community is known as asset mapping and needs analysis (AMNA) and is conducted in conjunction with the company, local government and the beneficiary communities. It is important, when using an outside service provider, to give specific detail as to the purpose of the assessment and the manner in which it should be approached prior to the assessment being conducted. For example:

- The scope of the assessment.
- The depth of the assessment.
- The size of the sample groups.
- The composition of the sample groups.
- The input and participation of local government.
- The participation of other stakeholders in the assessment.
- The use and integration of existing resources during the desktop stage of the assessment that includes the local Integrated Development Plan, Provincial Development Plan, Statistics South Africa, etc.

Rather than focusing on the problems to fix within communities and addressing such challenges entirely with external skills and funding, asset mapping identifies individuals, groups and institutions within a community that might play key roles in growing a community's social and economic well-being (Du Plessis *et al.*, 2012). Asset mapping supports the sustainable development of communities through the strengthening of community-based assets and the networks between community actors (Du Plessis *et al.*, 2012).

Melvin Oliver, the former vice president of the Ford Foundation, further elaborated on the importance of asset building: An "asset" in this context is a special kind of resource that an individual, organisation, or entire community can use to reduce or prevent poverty and injustice (Beeferman, 2001). It is usually described as a "stock" that can be drawn upon, built upon, or developed, as well as a resource that can be shared or transferred across generations (Beeferman, 2001). As the poor gain access to assets, they are more likely to take control of important aspects of their lives, to plan for their future and deal with economic uncertainty, to support their children's educational achievements, and to work to ensure that the lives of the next generations are better than their own (Oliver, 1996).

- **Stakeholder Engagement**

  In the context of the renewable energy sector, stakeholders are more narrowly defined as persons, groups or organisations within the 50km radius that have a direct or indirect interest in the renewable energy facility.

  - Stakeholder Engagement Strategy (SES)

    The Stakeholder Engagement Strategy (SES) outlines the overall approach for engaging with stakeholders and includes a Stakeholder Engagement Plan (SEP). The stakeholder engagement plan is a detailed list of stakeholders with specific interaction methodologies. Methodologies include listening, sharing information, engaging and communicating with all stakeholders. The SES provides an opportunity to formalise stakeholder engagement practice and the impetus to develop a good practical model for all present and future stakeholder engagement activities.

- Scope of the SES

  The SES is both a strategic and systematic approach to stakeholder engagement and should represent the RE company's on-going commitment to work effectively with all its stakeholders, to learn from past stakeholder engagement experiences and continue to improve performance. Tools and resources are developed to enable the RE company to increase and target stakeholder engagement and form genuine partnerships. Key partners identified include local government, non-government organisations, communities, neighbouring RE companies and beneficiary community trusts. The SES seeks to:

  - ensure a more tailored and coherent approach to stakeholder engagement;
  - enable better planned and more informed policies, partnerships, projects, programmes and communications;
  - position stakeholder engagement as a core business of the RE company; and
  - facilitate effective communication, collaboration and knowledge sharing; communicate the RE company's commitment to, and principles of, stakeholder engagement.

  For these benefits to be realised, stakeholder engagement must be embedded within the culture and core functions of the RE company. The commitment and integration of stakeholder engagement will lead to better outcomes for the RE company and beneficiary community trust.

- The Objectives and Principles of the SES

  Four key objectives have been identified to form the basis of the SES:

  - To manage risks and expectations of all stakeholders by providing mechanisms to identify, engage, and manage all stakeholders;

- To build sustainable relationships between stakeholders through active engagement, communication and mutual understanding;
- To create value through stakeholder involvement in socio-economic development projects;
- To assess the impact of the engagement on the various stakeholders;
- To measured the efficacy of the SES periodically against these objectives to ensure efficiency and effectiveness;

Three core principles should underlie all stakeholder engagement and should serve as a measurement for day-to-day interactions:

- Accountability: As outlined in the company's SEC Charter
- Respect: All stakeholders should be treated with respect.
- Accessibility: To provide open lines of communication and interaction with all stakeholders.

- SES Approach

The approach to stakeholders defines the process from identification through to establishment of on-going relations. Through the RE facility construction process, some stakeholders are identified informally through direct and indirect contact and interactions. The process of informal interaction must be formalised to ensure that relationships are managed, maintained and developed throughout the lifespan of the RE facility. Furthermore, throughout the lifetime of the facility, the expectation is that stakeholders will change and therefore it is useful to define an approach to stakeholders as shown in Table 7.2.

Table 7.2: Keys steps for multi-stakeholder management	
Key steps	**Description**
Identify	Draw up a database of stakeholders based on formal and informal interaction with local government, community leadership and community-based organisations and influential others.
Categorise	Categorise stakeholders in endemic groups as identified below.
Prioritise	Place stakeholders in levels of importance and influence. See Stakeholder Prioritisation Sphere below.
Engage	Base the level, frequency and form of engagement on the Prioritisation Sphere.
Monitor and Report	Carry out various internal and contextual monitoring and report regularly.
Evaluate and Prioritise	Evaluate the relationship in terms of influence and importance and re-assign prioritisation.
Source: Researcher's own construction	

- Categorisation

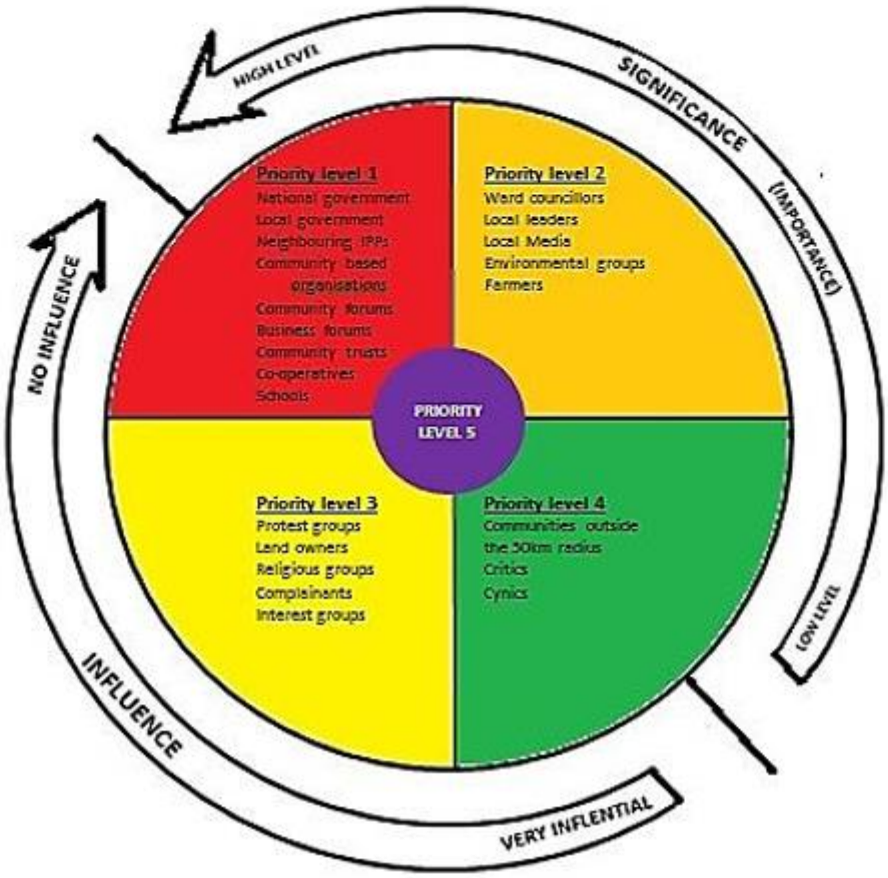
  The following key categories of stakeholders in the RE sector can be identified:

  - National Government – Department of Energy and more specifically the IPP Office.
  - Local Government
    - District Government
    - Provincial Government
  - South African Police Services
  - Business Forums
  - Local Businesses
  - Community Forums
  - Trustees
  - Neighbouring REIPPP
  - Land Owners
  - Ministers' Fraternal
  - Schools

- Other

– Prioritisation: Categories of stakeholders can be classified according to their level of significance and influence as shown in Figure 7.6.

Figure 7.6: Sphere of significance and influence



Source: Researcher's own construction

These classifications are used as part of prioritisation:

- Priority level 1: This level of stakeholders requires the most attention and engagement. Information sharing and education are the primary tools used to build trust and relationships with these stakeholders. Even though all government departments will have Priority Level 1, the frequency of engagement and the methods of engagement are determined by the hierarchy of the stakeholder. For example, the mayor will have fixed dates for meetings and presentation.

- Priority level 2: This level of stakeholders requires less attention and limited pro-active engagement, but they are an important resource for assisting in communication to the broader community. This group requires constant updating in the form of newsletters and enquiries or complaints lodged.
- Priority level 3: Often this level of stakeholders needs to be constantly monitored. It is important to respond to any request or enquiries made by this group or they could pose a problem.
- Priority level 4: The stakeholders that fall into this group generally need to be kept informed but are less likely to be interested in being actively engaged.
- Priority level 5: This category of stakeholder is constantly shifting between levels and can be any one of the identified stakeholders. These stakeholders require constant monitoring in order to determine the form of engagement. The prioritisation sphere must be constantly updated to ensure appropriate actions are taken to prevent undue crises developing.

- Methods of stakeholder engagement

  A range of methods is applied to stakeholder engagement as shown in Table 7.3.

Table 7.3: Example of a stakeholder engagement methodology

Method	Description	Who/Why/When
Meetings	Scheduled formal meetings as well as meetings on request.	Priority level 1 stakeholders Update on activity, permissions, strategic partnerships. (Refer to Stakeholder Map)
Presentations	Formal Presentations e.g. PowerPoint to municipal council.	Priority level 1 stakeholders Update on activity, permissions, strategic partnerships. (Refer to Stakeholder Map)
Newsletters	A quarterly newsletter with an update on activities and relevant	Send to all Stakeholders on the Database.

	information.	
Emails	Emails sent as required	In response to enquiries or complaints or information sharing. (See Stakeholder Map).
Telecoms	As required.	All stakeholders as necessary.
Media	Advertising and media releases.	Newspapers and radio as per their requests or *ad hoc* project requirements.
All of the above	As required	See Stakeholder Map.
Source: Researcher's own construction		

- Stakeholder Engagement Methodology Plan

  The Stakeholder Map and Stakeholder Engagement Plan are designed to track the details of each stakeholder and the form and implementation of engagement. The key components of the map and plan cover:

  - Category: as described above.
  - Identification: including organisation name, individual name, contact number, email address and town.
  - Prioritisation: ranking as per description above.
  - Frequency and method of engagement.
  - Primary and secondary relationship holders.
  - Calendar with 12 month view of key engagements planned

- Monitoring, Evaluation and Reporting on Stakeholders

  Monitoring and evaluation enables the company to measure the overall success of the SES and associated Stakeholder Engagement Plan (SEP) with a view achieving more effective stakeholder engagement.

  - Monitoring

    Two types of routine monitoring can be identified, namely:

    - Internal performance monitoring; and
    - Contextual monitoring.

Internal performance monitoring involves regular tracking of whether the actions identified in the SEP have been implemented. It also monitors the mitigation of potential risk as well as complaints from stakeholders. If necessary, corrective actions should be taken to obviate any further risks and resolve the respective issues. Reporting on the findings of this monitoring should be seen as part of the responsibility of the Social and Ethics Committee (SEC).

- Evaluating

  Table 7.4 shows an example of a monitoring and evaluation process.

Table 7.4: Example of monitoring and evaluation

Evaluation	Responsible holder	Recipient	Scope
Monthly evaluation	CLO	Community Operations Manager	To determine whether the objectives set in the SES and associated plan and map were achieved; To determine whether the goals and objectives set in the SES remain appropriate. This serves as an input into the next version of the strategy.
Quarterly evaluation	COM	SEC	To identify the need for possible changes to the SES and its plan.
Biannual evaluation	SEC	Board	

Source: Researcher's own construction

- Impact Assessment

  Engagement is required at key points in the stakeholder engagement process, both in anticipation of, and in response to, positive and negative impacts or changes. It is therefore important that engagement activities be designed to support key milestones as well as the transition periods between project life cycles. The following questions should be considered:

  - Have all the relevant stakeholders been identified?
  - Have all the stakeholders been categorised correctly?

- Have all the stakeholders been given the appropriate level of priority?
- Have all the stakeholders been engaged in the appropriate manner?
- Have all the stakeholder concerns been addressed?
- Have stakeholder risks been addressed/ mitigated?
- Impact report.

7.8.6 Objectives

The objectives of managing revenue for beneficiary communities within the renewable energy sector need to be pre-defined in order to assure that all the legal, social and economic objectives of the renewable energy company are met while simultaneously addressing issues of transformation, sustainability and local economic growth. Objectives also must be defined very specifically in terms of the obligations set out by the DoE, the corporate social commitment of the company and the context of the beneficiary community. Therefore, objectives must be very clearly articulated, detailed, measurable and have scheduled dates for completion. The latter is particularly important in terms of the obligations imposed by the DoE. When formulating the objectives, it is important to incorporate all elements of the business that will play a direct and indirect role in reaching the objectives. This would include senior, middle and lower management. In practice, this would include the CEO, CFO, Community Operations Manager (COM), the Community Projects Officer (CPO), and Stakeholder Relations Officer (SRO). This approach has a number of advantages that is crucial for the success of managing revenue for the beneficiary communities of renewable energy companies in RSA. Advantages include:

- Buy-in from senior management on proposed initiatives and the resources required to execute them. This will also facilitate and reassure stakeholders such as the shareholders and lenders that the company is not only meeting its obligations but also making a tangible and sustainable difference in the beneficiary communities.

- Buy-in from middle and lower management, especially, who feel more committed because they have had a direct hand in formulating the objectives. This will ensure that lower management feel valued and have a greater sense of the bigger picture. By including lower management, which is often the interface between the company and the community, the company can determine whether the objectives are not only realistic but also practicable, and can identify and mitigate potential risks early in the project.

It is important to note that because of the unique SED and ED obligations under which the renewable energy sector is required to operate, the relatively short period for which the sector has been operating in RSA, and the lack of experiential knowledge in this field, the purpose of the objectives might differ somewhat from other managerial objectives. This might be complicated further by a lack of understanding of the full extent of the capacity that might be required, including staff, to achieve the objectives of the project successfully. Therefore, the purpose of these objectives might include:

- To co-ordinate, facilitate and concentrate sufficient existing resources within the company to meet its SED and ED objectives. This will include considering the employment of a specialist SED and ED director and or the use of outside SED and ED practitioners.
- To monitor, evaluate and assess the impact of the company's performance in meeting its SED and ED objectives.
- To promote a strategic and focused approach to SED and ED in the beneficiary communities and, in so doing, motivate both staff and the communities jointly to ensure the project's success.

7.8.7 Internal policies and processes

A policy is a declaration that defines the intention of the goals and priorities of a community, organisation or government (Dukeshire & Thurlow, 2002). Policies outline the roles, rules and procedures (Dukeshire & Thurlow, 2002). Policies create a framework within which the administration and staff can perform their assigned duties (Dukeshire & Thurlow, 2002). This is particularly relevant to managing SED and ED revenue for beneficiary communities in the renewable energy sector in RSA. A number of existing policy frameworks can be adapted to incorporate the unique elements of the renewable energy sector in RSA. The main purpose of the policies is to ensure that the Implementation Agreement obligations are met which includes all the economic development commitments. The following policy documents have been identified, amongst others:

- Policy for Drafting Policies
- SED and ED Funding Policy and Procedure
- Enterprise Development and Procurement Policy
- Media Policy
- Complaints Management Policy

7.8.7.1 Policy for Drafting Policies

This policy sets out the format for drafting policies. The policy gives the policy writer a framework within which to write policies, the typeface and font size that is to be used as well as the overall layout of the policy document. The policy for drafting policies ensures that all policies are uniform and gives the reader a clear and systematic understanding of the purpose of the policy. The policy for drafting policies also ensures that the correct approval procedure is followed when reviewing, changing and implementing policies. It ensures the control of policies, policy monitoring and review, and staff training and requirements to implement the policies.

7.8.7.2 Socio-Economic and Enterprise Development Funding Policy

The purpose of this policy document is firstly to contextualise the socio-economic and enterprise development obligations of the renewable energy company. It refers to other documents such as the Implementation Agreement, the Power Purchase Agreement and Direct Agreements. The policy ensures that those who have been given the task of implementing the policies have a clear understanding of what is required to carry out SED and ED initiatives effectively. The SED and ED policies are also linked to the over-arching vision and mission of the RE company to ensure alignment with the core business of the company. The policy may also refer to other, related company documents such as the Memorandum of Incorporation and the Social and Ethics Charter. The policy document should also contain clear objectives, guidelines and procedures to be followed in meeting the SED and ED objectives.

7.8.7.3 Media Policy

The nature of any form of SED and ED is that it attracts media attention and requires communication with the communities from time to time. It is crucial to control and monitor the content and method of communication. The purpose of the media policy is to give clear guidance on the manner in which the company engages with the media. It outlines the authority to sign-off media releases, communicate with the media, and deal with high-level stakeholder communications.

7.8.7.4 Complaints Management Policy

Effective engagement with communities requires an effective system of dealing with queries and complaints. The purpose of the policy is to give guidelines and processes on how complaints and queries are managed and resolved. This also includes a complaints register to record the process that should be followed from the receipt of complaints to the final resolution and feedback to the complainant.

7.9 Concluding Remarks

The empirical results of this study of the perceived success of managing revenue for beneficiary communities of renewable energy companies in South Africa will not only assist practitioners and managers with the management of SED and ED but also provide a credible platform for any comparative research in the field of managing beneficiary revenue.

Socio-economic development, enterprise development and community trust revenue have the potential to transform beneficiary communities radically by dramatically improving their quality of life and economic growth in the future. Social challenges such as poverty, unemployment, housing, food security and access to the economy can be improved significantly through well thought out and constructed, sustainable initiatives. Local social evils such as teenage pregnancy, alcoholism, substance abuse and domestic violence can be addressed earnestly and eventually eradicated through sustained intervention programmes funded by renewable energy revenue for SED. Local entrepreneurs can be supported through ED funding to grow the local economies of beneficiary communities. The long-term potential to create legacy projects that will outlive the renewable energy facility offers an amazing opportunity to change the economic landscape of local communities. Co-ordinated, multi-sector participation through support services, outside advice and financial management can contribute meaningfully towards successful development in beneficiary communities. It is clear from the research results that a multi-sector participation approach to managing revenue for beneficiary communities is a credible and feasible way of implementing transformational and sustainable initiatives. It is also important to recognise that medium- and long-term initiatives must run parallel with developmental benefits such as education and infrastructure development as highlighted by the empirical results. For example, in order to improve matriculate results and eligibility for tertiary studies significantly in 12 – 15 years' time, educational interventions must be started immediately and across the educational spectrum, especially early childhood development. This includes creating a more enabling environment through infrastructure development which is viewed not only as part of job creation but also as an improvement in the socio-economic conditions in the beneficiary communities.

Lastly, the opportunity created by the renewable energy sector offers sufficient time to plan sustainable initiatives because of the twenty-year funding period. Without sustainability as a key element in revenue management, much of the developmental benefits gained during the twenty-year period would fizzle out and eventually cease. With strategic planning, sound financial and project management, sustainable initiatives can be identified and implemented. It is now known from the most recent available literature that the projected amount of SED, ED and community trust spending over the next twenty to twenty-five years in RSA is in excess of R50 billion. The renewable energy sector has the opportunity to use these funds to change the beneficiary communities meaningfully for the better and ultimately have a positive impact on the overall economy of RSA.

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Appendix A: Questionnaire Cover Letter

Dear Respondent

In an effort to assist with the management of revenue for beneficiary communities, especially in the renewable energy sector, we are appealing to industry professionals to participate in this PhD Research Study. You have been identified as having the experience and professional expertise to add value to this research.

The study, comprising of various national and international organizations, is being conducted in conjunction with the Nelson Mandela Metropolitan University in Port Elizabeth. We would therefore like to invite you to anonymously and voluntarily participate in completing a 10 minute electronic survey by following the web link below to the Nelson Mandela Metropolitan University website.

Your participation in this research study was immensely beneficial to significantly improving the lives of impoverished communities in South Africa and elsewhere. Some of the questions may appear repetitive but they have been designed to either prove or disprove the model. Feedback regarding the outcome of the survey was made available to all participants. No identification details are required. Any questions, feedback or comments are welcomed and can be mailed to renewablecommunitiesforum@gmail.com. If you know of anyone who could assist with this research study and would be prepared to complete this questionnaire, please forward this email to them.

CLICK HERE TO BEGIN

Kind regards

Ric Amansure

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APPENDIX B: QUESTIONNAIRE

FACTORS INFLUENCING REVENUE MANAGEMENT FOR BENEFICIARY COMMUNITIES IN THE RENEWABLE ENERGY SECTOR IN SOUTH AFRICA

Section A: Demographic Questions

Please answer all the questions by clicking on one of the choices

What is your gender?: Male ☐ Female ☐

What is your age?: 18-29 years old ☐; 30-49 years old ☐; 50-64 years old ☐; 64 years and over ☐.

What is the highest education qualification you have completed?

Certificate: ☐; Diploma ☐; Bachelor's Degree ☐; Honour's Degree ☐; Master's Degree ☐; Doctorate ☐.

Are you in any way involved in the renewable energy sector?

Yes ☐; No ☐.

Are you in any way involved with the beneficiary communities?

Yes☐; No ☐.

Are you involved in community development? Yes ☐ No☐.

Section B: Definitions:

Beneficiary communities	Communities that benefit directly from funding, resources and services usually in the form of community development projects.
Expert / Expertise:	Organizations or individuals with specialised knowledge in a particular field.
NGO:	Non-governmental Organisation
NPO:	Non-profit Organisation
Organisation:	The organisation that you are employed or contracted by to perform a particular role.
Outside advice:	Information obtained from consultants and consulting service providers to assist the organization in achieving its objectives.
Projects:	Projects that are undertaken by the organisation for the benefit of the community.
Support Service Providers:	Professional companies that provided services to the organisation to assist with its community development projects.

Section C: Survey Questions

A number of factors, influencing revenue management for beneficiary communities in the renewable energy sector in the Republic of the South Africa, are listed below. Using the following scale, please indicate to what extent that you agree or disagree with the statements by circling the appropriate number in each row:

1 = Strongly disagree;

2 = Disagree;

3 = Somewhat/slightly disagree;

4 = Neither agree nor disagree (neutral);

5 = Somewhat/slightly agree;

6 = Agree;

7 = Strongly agree.

No.	**Questions**	**Scale** 1 = Strongly disagree; 2 = Disagree; 3 = Somewhat/slightly disagree; 4 = Neither agree nor disagree (neutral); 5 = Somewhat/slightly agree; 6 = Agree; 7 = Strongly agree.							**For Official Use**
1	Our organisation makes use of outside consultants to provide expert advice on community development.	1	2	3	4	5	6	7	OA1
2	Sound financial management is important for successful community development.	1	2	3	4	5	6	7	FM1
3	Effective change management is important to ensure successful revenue management for beneficiary communities.	1	2	3	4	5	6	7	CM1
4	Most people in beneficiary communities have the capability to improve their own living circumstances.	1	2	3	4	5	6	7	HD1

5	Improving the education for people in beneficiary communities can have a positive impact on their communities.	1	2	3	4	5	6	7	ED1
6	Our organisation makes use of support services to enhance community development projects.	1	2	3	4	5	6	7	SS1
7	Formal strategic planning can promote effective revenue management for beneficiary communities.	1	2	3	4	5	6	7	SPL1
8	Strategic partnerships can have a positive influence on revenue management for beneficiary communities.	1	2	3	4	5	6	7	SP1
9	Infrastructure development can accelerate economic growth in beneficiary communities.	1	2	3	4	5	6	7	ID1
10	Project management is a key component of revenue management for beneficiary communities.	1	2	3	4	5	6	7	PM-1
11	Our organisation believes in the value of good governance in all our activities.	1	2	3	4	5	6	7	GG1
12	Effective revenue management improves the relationship between our organisation and the beneficiary communities.	1	2	3	4	5	6	7	RM1
13	Outside advisers can give our organisation a different perspective on beneficiary communities.	1	2	3	4	5	6	7	OA2
14	Effective strategic financial management is important for successful community development projects.	1	2	3	4	5	6	7	FM2
15	Change management can benefit revenue management for beneficiary communities.	1	2	3	4	5	6	7	CM2
16	People in beneficiary communities have the capability to satisfy their own human needs.	1	2	3	4	5	6	7	HD2
17	Education increases the employability of people in beneficiary communities.	1	2	3	4	5	6	7	ED2
18	Support service providers can monitor the impact of community development projects.	1	2	3	4	5	6	7	SS2
19	Formal strategic planning increases the chances of successful community development projects.	1	2	3	4	5	6	7	SPL2
20	Strategic partnerships with the local government are important for the success of certain community development projects.	1	2	3	4	5	6	7	SP2
21	Project management skills can improve revenue management for beneficiary communities.	1	2	3	4	5	6	7	PM2
22	Good governance improves relationships between our organisation and the beneficiary communities.	1	2	3	4	5	6	7	GG2
23	Revenue management can assist our organisation with measuring the impact of projects in beneficiary communities.	1	2	3	4	5	6	7	RM2
24	Our organisation makes use of various outside experts for our community development projects.	1	2	3	4	5	6	7	OA3

25	Strategic financial management is important to ensure successful community development projects.	1	2	3	4	5	6	7	FM3
26	Change management can help communities to overcome their fear of change in their communities.	1	2	3	4	5	6	7	CM3
27	Revenue management can improve the impact of community development projects.	1	2	3	4	5	6	7	RM3
28	People in beneficiary communities are capable of developing their own resources.	1	2	3	4	5	6	7	HD3
29	Education can improve the lifestyle choices of people in beneficiary communities.	1	2	3	4	5	6	7	ED3
30	To ensure successful community development outcomes our organisation makes use of support service providers to assist with community projects.	1	2	3	4	5	6	7	SS3
31	Formal strategic planning can maximise the use of available resources within our organisation.	1	2	3	4	5	6	7	SPL-3
32	Strategic partnerships with other funders are important for large community development projects.	1	2	3	4	5	6	7	SP3
33	Effective project management when dealing with beneficiary communities is valuable.	1	2	3	4	5	6	7	PM3
34	Good governance can help to build trust between our organisation and the beneficiary communities.	1	2	3	4	5	6	7	GG3
35	Our organisation believes in the value of effective revenue management.	1	2	3	4	5	6	7	RM4
36	Outside advisors have a large network of resources that can provide assistance with community development projects.	1	2	3	4	5	6	7	OA4
37	Effective strategic financial management improves good governance for community development projects.	1	2	3	4	5	6	7	FM4
38	Effective change management can make people in beneficiary communities more willing to change.	1	2	3	4	5	6	7	CM4
39	Effective revenue management can enhances the success rate of community development projects.	1	2	3	4	5	6	7	RM5
40	People in beneficiary communities are capable of creating their own opportunities for community development.	1	2	3	4	5	6	7	HD4
41	Education can improve the quality of life of people in beneficiary communities.	1	2	3	4	5	6	7	ED4
42	Our organisation makes use of community based support service providers such as NGOs and NPOs.	1	2	3	4	5	6	7	SS4
43	Formal strategic planning will give our organisation a clear direction on how to better manage community development projects.	1	2	3	4	5	6	7	SPL4
44	Strategic partnerships with community-based organisations are important for the successful community development.	1	2	3	4	5	6	7	SP4

45	Infrastructure development has long-term economic benefits for beneficiary communities.	1	2	3	4	5	6	7	ID2
46	Effective project management reduces risks to the organisation when involved in community development projects.	1	2	3	4	5	6	7	PM4
47	Good governance ensures that our organisation acts with integrity when involved in community development projects.	1	2	3	4	5	6	7	GG4
48	Infrastructure development can ensure better service delivery in beneficiary communities.	1	2	3	4	5	6	7	ID3
49	Infrastructure development improves the quality of life of beneficiary communities.	1	2	3	4	5	6	7	ID4
50	Our organisation believes that there is value in spending money on outside advisors.	1	2	3	4	5	6	7	OA5
51	Effective strategic financial management promotes accountability of our organisation.	1	2	3	4	5	6	7	FM5
52	Effective change management demonstrates that change can lead to a better life in beneficiary communities.	1	2	3	4	5	6	7	CM5
53	People in beneficiary communities generally know what they need to survive.	1	2	3	4	5	6	7	HD5
54	Infrastructure development can significantly reduce levels of poverty in beneficiary communities.	1	2	3	4	5	6	7	ID5
55	Education can give people in beneficiary communities' better access to the formal economy.	1	2	3	4	5	6	7	ED5
56	Our organisation makes use of support service providers to objectively assess the impact of community development projects.	1	2	3	4	5	6	7	SS5
57	Formal strategic planning improves community development in beneficiary communities.	1	2	3	4	5	6	7	SPL5
58	Strategic partnerships can increase the success rate of community development projects.	1	2	3	4	5	6	7	SP5
59	Good corporate governance is essential to effective infrastructure development in beneficiary communities.	1	2	3	4	5	6	7	GG5
60	Effective project management ensures that community development projects meet quality standards.	1	2	3	4	5	6	7	PM5

LEGEND FOR QUESTIONNAIRE CODES	
AO	Outside Advice
FM	Financial Management
CM	Change Management
HD	Human Development
ID	Infrastructure Development
ED	Education
SS	Support Services
SPL	Strategic Planning
SP	Strategic Partnerships
GG	Good Governance
PM	Project Management