

RESEARCH AND DEVELOPMENT OF A PRELIMINARY SOUTH AFRICAN
VOLUNTARY CARBON STANDARD FOR LANDSCAPE RESTORATION PROJECTS

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Abstract

The mandatory and voluntary carbon markets have both developed around the increasing trade of carbon offsets. In order to add legitimacy to an otherwise intangible commodity there has been a rise in the development of third party carbon certification standards, particularly in the voluntary market. These standards aim to provide independent, third party certification to projects that are developed specifically to generate and sell carbon offsets. South Africa has the opportunity to engage with these markets, but current participation in and certification of projects is sluggish. These projects have not taken off mainly due to the high transaction costs and lag times surrounding the current certification of projects', complex baseline methodologies, accounting uncertainty and the often bureaucratic systems surrounding the current voluntary carbon certification standards and methodologies.

In order to overcome these pitfalls this project aimed to address these challenges through initiating the development of a preliminary South African voluntary carbon standard. This was done by: a) undertaking a critical assessment of the development of current carbon markets, with a particular focus on voluntary markets and third party certification, b) critically analysing the current voluntary carbon certification standards for best practices, pitfalls and weaknesses. To provide a better understanding of the historical development of voluntary certification standards, various established certification standards were evaluated, including the Forestry Stewardship Council (FSC), Marine Stewardship Council (MSC) and ISO 14000 standards. This analysis focussed on the challenges they faced in acceptance and in particular how they have managed to operationalize sustainable development within the certification process.

In order to explicitly ensure the incorporation of a sustainable development assessment of projects under the proposed standard, an expert workshop was held with 14 experts from a wide variety of disciplines. These experts identified the crucial sustainable development challenges facing South Africa. They identified 12 sub-themes and 44 indicators that could be used to measure and incorporate sustainable development indicators into the certification process. These were then further developed through using the 'Input – Output – Outcome – Impact' framework model which allowed the indicators to be organised and understood and thus practical.

The analysis of the voluntary certification standards and the development of the sustainable development indicator framework were ultimately incorporated into the development of the proposed South African voluntary carbon standard. The key approach to this standard is the incorporation and focus of the proposed standard to ensuring the generation of net SD benefits and placing them at the same level as carbon within the project design and development, validation and verification process. The full and effective integration of these has been missing within current fully fledged voluntary carbon standards, as they often rely on a mixture of project design standards to achieve this. Offering the inclusion of all components into one standard, specifically designed for South Africa, will not only assure SD credentials but also increase transparency and understanding, and reduce costs.

This thesis allowed for the development of innovative new ideas and process focussed specifically at including and mainstreaming South Africa's developmental challenges into the certification process. This is the hoped that the standard will effectively certify South African based landscape restoration projects, but also decrease costs and increase efficiencies in order to encourage the development of these projects. This preliminary standard not only aims to incorporate and address all the issues identified but also has the end goal of acting as the basis for future debate and development surrounding a potential South African voluntary carbon certification standard.

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Contents

Abstract	ii
Acknowledgements	iv
List of Tables	ix
List of Figures	x
Acronyms and Abbreviations	xi
Chapter 1: General Introduction	1
1.1. Introduction	2
1.2. Climate Change and the New Carbon Economy	2
1.3. The Development of the Carbon Markets	3
1.4. South African Context for the Study	3
1.5. Aim of Thesis	4
1.6. Vision of Thesis	5
1.7. Structure of Thesis	6

Part 1: Identifying the Lessons to be Learnt in Certification Design

Chapter 2: Carbon Markets, Standards and Landscape Restoration: A Review	9
2.1. Purpose of Chapter	10
2.2. Development of Payment for Ecosystem Services (PES)	10
2.3. PES Market Development	12
2.4. Sustainable Development and the New Carbon Economy	12
2.5. Carbon Markets – Mandatory and Voluntary	14
2.6. Mandatory Markets	15
2.6.1. Kyoto Mechanisms	15
2.6.2. European Union Emission Trading Scheme (EU ETS)	16
2.5.3. Compliance trading outside the Kyoto Protocol (KP)	17
2.7. Voluntary Markets	17
2.7.1. Chicago Climate Exchange (CCX)	17
2.7.2. Over-the-counter Market (OTC)	18
2.8. The Voluntary Carbon Market and Voluntary Carbon Standards	18
2.8.1. Fully-fledged carbon standards	20
2.8.2. Project Design Standards	20
2.8.3. Offset Standard Screens	21
2.8.4. Offset Accounting Protocols	21
2.8.5. Other Standard Types	21
2.9. Landscape Restoration and the Voluntary Carbon Market	23
2.10. Afforestation/ Reforestation (A/R) and Voluntary Carbon Standards	25
2.11. South Africa and the Carbon Market	29
Chapter 3: Analysis of Voluntary Carbon Standards for Best Practice Identification	31
3.1. Introduction	32

3.1.1. Purpose of Chapter.....	32
3.1.2. Introduction.....	32
3.2. Methods and Process.....	33
3.2.1. Selecting Evaluation Criteria.....	33
3.2.2. Selecting Standards for Review.....	34
3.2.3. Developing a Score and Ranking Standards.....	36
3.2.4. Best Practice Identification.....	36
3.3. Voluntary Carbon Standard Criteria - Discussion.....	37
3.3.1. Essential Criteria.....	37
3.3.1a. Baseline (BAU).....	37
3.3.1b. Additionality.....	39
3.3.1c. Leakage.....	41
3.3.1d. Permanence.....	41
3.3.1e. Co-benefits.....	42
3.3.1f. Transparency.....	42
3.3.1g. Registry.....	43
3.3.1h. Public Participation.....	43
3.3.1i. Third Party Auditing.....	44
3.3.1j. Verification Frequency.....	44
3.3.2. Variable Criteria.....	44
3.3.2a. Type of Credits.....	44
3.3.2b. Project Location.....	46
3.3.2c. Project Types (Eligibility).....	46
3.3.2d. Cost of Certification.....	46
3.3.2e. Price of Offsets.....	46
3.4. Results.....	46
3.5. Discussion.....	49
3.5.1. VCS.....	51
3.5.2. Gold Standard.....	51
3.5.3. VER+.....	52
3.5.4. CAR.....	53
3.5.5. ACR.....	53
3.5.6. CarbonFix.....	54
3.5.7. CCX.....	54
3.5.8. CCBS.....	55
3.5.9. SocialCarbon.....	56
3.5.10. Plan Vivo.....	56
3.5.11. Panda Standard.....	57
3.6. Conclusion.....	57
Chapter 4: An Analysis of the Development of Sustainable Development Indicators an Voluntary Certification Standards in Multiple Environmental Sectors.....	61
4.1. Introduction.....	62

4.1.1. Purpose of Chapter.....	62
4.1.2. Certification in Context	62
4.1.3. Voluntary Environmental Programs	63
4.1.4. Eco- Labelling.....	63
4.1.5. Value of Analysis for this Study.....	65
4.2. Sustainable Development, Certification and Indicators.....	65
4.2.1. Sustainable Development	65
4.2.2. Sustainable Development Indicators	66
4.2.3. Sustainable Development Indicator Frameworks	71
4.3. Examples of Third Party Certification Standards	72
4.3.1. Sustainable Forestry Certification	72
4.3.2. Sustainable Fisheries Certification	75
4.3.3. Environmental Management Systems	78
4.4. Lessons to be learnt for Voluntary Carbon Certification SD Indicator Development. 79	
4.4.1. Principles and Criteria of SD Indicators and Certification	79
4.4.2. Incorporating Local context into SD Indicator Development	80
4.4.3. SD Indicator Frameworks	81
4.4.4. Third Party Certification.....	82
4.4.5. Costs, Complexities and Public Participation.....	82
4.5. Developing SD Indicator Guidelines for a Voluntary Carbon Standard	84
4.6. Discussion and Conclusion.....	85

Part 2: Development of a Preliminary Voluntary Carbon Standard for South African Landscape Restoration Projects

Chapter 5: The Development of a Standard Specific SD Indicator Framework.....	88
5.1. Introduction.....	89
5.1.1. Purpose of Chapter.....	89
5.1.2. Sustainable Development and Co-Benefits	89
5.1.3 Voluntary Carbon Certification, LULUCF and SD Indicator Frameworks	90
5.2. The SD Indicator Framework Development Process.....	92
5.2.1. Aims and Objectives of the Workshop	92
5.2.2. Workshop Process.....	93
5.2.3. Identification of SD Themes and Sub-Themes.....	93
5.3. Workshop Outcomes.....	96
5.3.1 Fitting Indicators in South Africa’s SD Challenges	96
5.3.1a. Environmental Challenges	96
i. Water	96
ii. Biodiversity	98
iii. Land Degradation.....	100
5.3.1b. Environmental Indicators Discussion	100
5.3.2a. Socio-Economic Challenges	101
i. Socio-Economic Indicators	103
5.3.2b. Socio-economic Indicators Discussion.....	106

5.4 Developing a SD Framework for a proposed South African Voluntary Carbon Standard.....	107
5.4.1. The Input – Output – Outcome – Impact Framework (IOOI)	107
5.4.2. Developing the SD Indicator Assessment Framework.....	109
5.4.3. Incorporating the Indicators into the Standard Specific IOOI Framework	110
5.5. Practical Considerations of the SD Framework.....	113
5.5.1. SD Baselines	113
5.5.2. Data Collection Methods for Indicators.....	114
5.5.3. Reporting Guidelines and Periods	115
5.6. Conclusion	116
Chapter 6: A Preliminary South African Voluntary Carbon Standard	118
6.1. Introduction.....	119
6.1.1. Purpose of Chapter.....	119
6.1.2. Context for the Chapter.....	119
6.2. Standard Design Process.....	120
6.2.1. Standard Principles and Aims.....	120
6.3. The Development of a Preliminary South African Voluntary Carbon Standard	123
Step 1: Restoration Information Note (RIN) Development.....	123
Step 2: Determine Eligibility	126
Step 3: Developing Guidelines for a Restoration Design Document (RDD)	126
Step 3a. Determine and Calculate Baselines (Carbon and SD).....	127
Step 3b. Determine Additionality	131
Step 3c. Determine and Calculate Leakage and Permanence.....	138
Step 4: Public Participation.....	149
Step 5: Project Validation	153
Step 6: Registry.....	156
Step 7: Field Verification.....	156
6.4. Conclusion	158

Part 3: General Conclusion

Chapter 7: Discussions, Future Research and Conclusions	160
7.1. Voluntary Markets and the Development of Standards.....	161
7.2. The Development of a New Voluntary Carbon Standard – is it Muddying the Waters?	162
7.3. Voluntary Carbon Standards – Predicted Future Developments	164
7.4. Developing the South African Voluntary Offset Market.....	165
7.5. Conclusion - Future of the Proposed South African Voluntary Carbon Standard.....	166
References.....	168

List of Tables

Table 2.1: Voluntary Carbon Standards and their Classifications	22
Table 3.1: The Components of a Voluntary Carbon Standard.....	34
Table 3.2: Voluntary Carbon Standards Selected for Review	35
Table 3.3: Analysed Voluntary Carbon Standards	48
Table 3.4: Summary of evaluated Voluntary Carbon Standards	60
Table 5.1: Water Indicators.....	97
Table 5.2: Biodiversity Indicators.....	99
Table 5.3: Land Degradation Indicators	100
Table 5.4: Socio – Economic Indicators	104
Table 5.5: The proposed IOOI Framework for a South African Voluntary Carbon Standard	111

List of Figures

Figure 1.1: Thesis Structure	7
Figure 2.1: CDM projects by host country	15
Figure 2.2: The potential of various land management activities to increase the carbon sink of forestry or agriculture practices (Malhi et al., 2002)	24
Figure 4.1: Sustainable Development (adapted from Goodland and Daly, 1996).....	65
Figure 5.1: Workshop process followed to identify the broad list of SD indicators	95
Figure 5.2: The IOOI Framework (adapted from Gambrelli and Bucher, 2002)	108
Figure 6.1: The proposed South African Voluntary Carbon Standard certification process.....	122

Acronyms and Abbreviations

A/R	Afforestation/Reforestation
ACR	American Carbon Registry
AES	Applied Energy Services
AFOLU	Agriculture, Forestry and Land-Use
AIPs	Alien Invasive Plants
BAU	Business-as-usual
BMV	Brazil Mata Viva Standard
BRIC	Brazil, Russia, India and China
CAR	Climate Action Reserve
CCBS	Climate, Community and Biodiversity Standard
CCX	Chicago Climate Exchange
CDM	Clean Development Mechanism
CERs	Certified Emissions Reductions
CFR	Cape Floristic Region
CO ₂	Carbon Dioxide
DNA	Designated National Authority
DOE	Designated Operational Entity
DPSIR	Drivers, Pressures, State, Impacts, and Responses Framework
EIA	Environmental Impact Assessment
EMS	Environmental Management System
EU ETS	European Union Emissions Trading Scheme
FOS	Friends of the Sea
FSC	Forestry Stewardship Council
FTE	Full Time Equivalent Employees
GHG	Greenhouse Gasses
HFC	Hydro Fluorocarbon
IETA	International Emissions Trading Association
IOOI	Input – Output – Outcome – Impacts Framework
ISO	International Standards Organisation
JI	Joint Implementation
LULUCF	Land Use, Land-use Change and Forestry
MES	Market for Ecosystem Service
MPAH	Maputaland-Pondoland-Albany Hotspot

MSC	Marine Stewardship Council
MtCO _{2e}	Million metric tonnes of CO ₂ equivalents
NGOs	Non – Governmental Organisations
NPOs	Non Profit Organisations
OTC	Over-The-Counter
PDD	Project Design Document
PEFC	Program for Endorsement of Forest Certification
PES	Payments for Ecosystem Services
PIAs	Project Implementation Agreements
PIN	Project Information Note
RDD	Restoration Design Document
REDD	Reduced Emissions from Deforestation and forest Degradation
REDD plus	Reduced Emissions from Deforestation and forest Degradation including Sustainable Development benefits
RGGI	Regional Green House Gas Initiative
RIN	Restoration Information Note
SASS	South African Scoring System
SC	SocialCarbon
SD	Sustainable Development
SFI	Sustainable Forestry Initiative
SFM	Sustainable Forest Management
SoER	State of the Environment Report
tCERs	Temporary Certified Emissions Reductions
UNEP	United Nations Environmental Program
UNECE	United Nations Economic Commissions for Europe
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Verified Carbon Standard
VEP	Voluntary Environmental Program
VERs	Voluntary Emissions Reductions
VOS	Voluntary Offset Standard
WEF	World Economic Forum
WRI	World Resources Institute
WBCSD	World Business Council on Sustainable Development
WWF	World Wildlife Fund

Chapter 1:

General Introduction

1.1. Introduction

Climate change is seen as one of the most potentially devastating phenomena facing the globe today (IPCC, 2007). The evidence surrounding climate change is well documented by a steadily growing body of peer reviewed scientific literature, which is substantiated by rises in mean global air and ocean temperatures, rising sea levels, melting glaciers and abnormal climatic events (IPCC, 2007) and consistently cites anthropogenic sources, especially the increasing combustion of non-renewable fossil fuels and widespread land degradation, as the leading causes (IPCC, 2007). Anthropogenic emissions of greenhouse gasses (GHG), especially carbon dioxide (CO₂), have been identified as the leading causes and accelerants of global climate change (Kerr, 2007) and this evidenced that since the industrial revolution GHG emissions have been steadily increasing (Grubb et al., 1999). Current CO₂ levels in the atmosphere are at their highest levels recorded in 420 000 years, with CO₂ rising to 392 ppm in May 2010 (CO₂now.org, 2010). This has led to growing concern surrounding the potential devastating consequences of global warming and the subsequent risks of dramatic climate change events.

This problem has become entrenched within the global economic system as traditionally ecosystems goods and services have been seen as a public good and thus their value to the overall economic system has been neglected (Hunt, 2008). In particular the costs of the unabated release of CO₂, and other GHGs, into the atmosphere. To counter this phenomenon there has been a process of developing a market system in the trade of ecosystem goods and services. Crucial to this process is valuing and demonstrating the value of ecosystem goods and services to livelihoods and wellbeing of all humanity. This has transformed itself into concept of markets for ecosystem service (MES) or payments for ecosystem services (PES) frameworks (Wunder, 2005; Engel et al., 2008; Pagiola, 2008). These are key policy steps and development where a monetary value can be placed on ecosystem goods and services the through that reach and influence the appropriate policy development, government regulation and economic decision.

1.2. Climate Change and the New Carbon Economy

In 1997 the Kyoto Protocol (KP) became the overarching international policy tool designed to facilitate the stemming and reduction of global GHG emissions, with the goals of establishing viable PES markets at its heart. This was an important step as Lal (2002) states

that due to the pervasiveness of the GHG problem, international policy was, and still is, vital to the regulation of emissions. The KP has become the centre point around which environmental diplomacy and country specific climate change policy is formulated (Tangen and Hasselknippe, 2005). The KP specifically drives the use and implementation of market-based mechanisms and incentives to reduce atmospheric concentration of GHGs. Mechanisms that exist within the protocol include the Clean Development Mechanism (CDM), Joint Implementation (JI) and emissions reduction trading (Niesten et al., 2002). The agreement aims to reduce overall GHG emissions by 5.2% below 1990 levels by 2012 (Grubb et al., 1999). This is achieved by instituting GHG emissions reductions goals, for all Annex 1 (developed) countries. Where countries or institutions are able to reduce emissions over their targets, each ton of CO₂e equals one carbon credit that can be traded on the market (Galatowitsch, 2009). Under the rules of the CDM, developing countries who manage to reduce their GHG emissions or sequester CO₂ also qualify for carbon credits which can be sold onto the market (Galatowitsch, 2009). These allows for Annex 1 countries that are unable to meet their targets, or choose to continue to pollute, to meet their obligations through funding GHG reduction projects in developing countries and claim the credits produced from these projects.

1.3. The Development of the Carbon Markets

This has seen the rise of a number of new, innovative approaches to market development. In particular the continued development and refinement of the mandatory market, governed by the KP and the concurrent development of a voluntary market and third party certification systems. These aim to guide and add credibility to the offsets purchased in the previously informal markets (Galatowitsch, 2009). This market has seen the development of a wide variety of standards, which compete for market share (Merger and Pistorius, 2011). This is inherently based on their differing components, but also about the perception of quality and legitimacy of buyers about the offsets certified. One of the voluntary markets main goals it to open the market to a wider range of participants through decreasing costs and increasing efficiency within the certification process (Galatowitsch, 2009).

1.4. South African Context for the Study

Along with the rest of the world, South Africa is starting to see the potential of land based bio sequestration carbon offsetting projects as means to realise both climate change mitigation

objectives but also encourage sustainable development. There have been a number of initiatives started in recent years that aim to generate funding through selling the associated project's carbon credits in the market. These have mainly taken place in the informal carbon markets, or the selling of non-quantified offsets, through NGOs and projects such as Food and Trees for Africa (www.trees.co.za) and Elemental Equity (www.elemental equity.org). The main reason for the informal route of these projects is the prohibitive barriers to entry for small scale projects to gain certification, especially in terms of high levels of bureaucracy and the associated costs.

Even projects of a larger scale such as the Subtropical Thicket Restoration Project (STRP) have struggled to overcome the challenges currently associated with carbon certification. The STRP is the first, large scale bio sequestration project within South Africa and aims to become a practical example of a bio sequestration offset project. It was initiated in 2004 on public land within the Eastern Cape with the main aim is to restore degraded sub-tropical thicket, with the explicit aim to fund this through the generation and sale of voluntary carbon credits. This project forms part of the South African governments' Working for Woodlands initiative and has the potential to contribute large amounts of employment opportunities.

1.5. Aim of Thesis

It is within this sphere that this study is situated. It is motivated by the increasing development of country specific, 'embedded' standards in large developing countries such as China and Brazil that have focussed on the certification of country specific Land use, land use change and forestry (LULUCF) carbon offsetting projects. These initiatives have only recently gained marked success, particularly in Brazil. They have facilitated the creation of a new voluntary carbon standard that encourages the certification of local projects through reducing the current barriers to certification. This allows for projects to obtain certification quickly and create an internal voluntary carbon market where the loop between supply and demand is closed. These standards have also been lauded for their inclusion of sustainable development benefits that are focussed at addressing their country specific developmental challenges (Peters-Stanley et al, 2011).

South Africa has the opportunity to capitalise on this development. The development of a country specific voluntary carbon standard has become the cornerstone of these markets. While the countries already mentioned are much larger in GDP terms they are proving that it

is possible to both a) develop a local carbon market, and b) ensure sustainable development. The introduction of the South African Carbon Tax in 2012 discussion document has explicitly incorporated the potential to develop a local South Africa offset market (South African Revenue Service, 2012), but the terms have not been defined yet. This therefore is the perfect opportunity to debate within South Africa around the development of a potential country specific or regional carbon market and the associated carbon standards to be used within the scheme. While the development of a South African specific voluntary carbon standard is not the only option, it is one that cannot be ignored due to similar successes in other developing countries. Its potential to encourage the flow of funding to local sustainable development projects is something South Africa desperately needs.

Accordingly the focus of this study is the development of a proposed South African voluntary carbon standard as a starting point for the potential development of an operational South African Voluntary Carbon Standard to guide the development of this new market. This proposed standard is designed to specifically certify South African landscape restoration projects, with a direct emphasis on incorporating, mainstreaming and ensuring the generation of SD benefits from projects certified. This is emphasized for a number of reasons: 1) landscape restoration projects have been neglected in current certification standards in favour of afforestation or reforestation (A/R) projects, 2) they are historically the most difficult and costly to certify and as such have been neglected in developing countries, and 3) they offer potentially high levels of SD benefits.

1.6. Vision of Thesis

The vision of the proposed South African voluntary carbon standard (Box 1.1) sets out the final aim of this thesis. While this vision is used to guide the development of this thesis, it has to be stated that this thesis cannot aim to comprehensively address all of these in this one academic process. This thesis has the overarching aim to generate ideas and proposals for a South African specific landscape restoration carbon standard that will act as a starting point for any future developments.

Box 1.1.: Vision of Standard

- 1) Provide transparency and credibility to the South African voluntary carbon market by establishing the proposed standard as a rigorous standard for GHG removals.
- 2) Provide a trusted mark of assurance and credibility that the offsets purchased are real, reliable, additional and permanent.
- 3) Stimulate the South African carbon market through reducing transaction costs and ensuring a transparent and efficient certification process with increased innovation and the reduction of complexity within the certification process.
- 4) Develop a certification process that aims to incorporate and address South Africa's developmental challenges, especially poverty alleviation, water provision and biodiversity protection.
- 5) Ensure that projects have net environmental and social benefits and that these are effectively incorporated, monitored and reported on.

1.7. Structure of Thesis

This vision (Box 1.1) will serve to guide the development and structure of this thesis and the proposed content of the developed standard. In order to achieve this it is necessary to structure the thesis in three distinct parts (Figure 1.1):

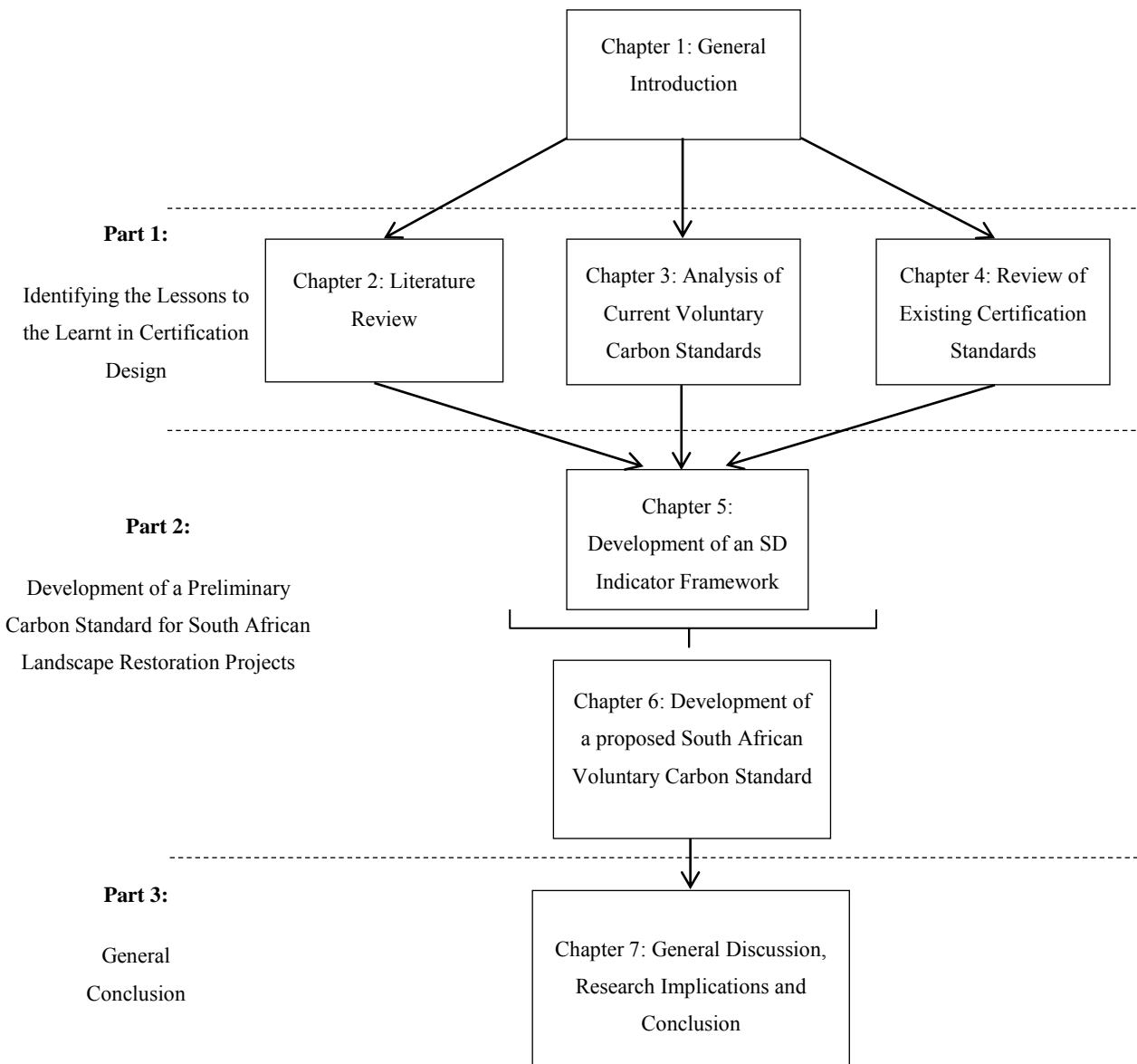


Figure 1.1: Thesis Structure

Part 1 comprises of Chapters 2, 3 and 4 with the key objectives of:

- Gaining a greater understanding of the carbon market developments and the key role players (Chapter 2);
- Analysing the best practices amongst current voluntary carbon certification standards (Chapter 3); and
- Understanding and analysing the development of voluntary certification systems in other markets, such as forestry, in order to learn lessons for the development of a voluntary carbon standard (Chapter 4).

To achieve this, Chapter 2 will provide an in-depth literature review of the current thoughts and developments surrounding environmental markets and the inclusion of sustainable development. This will focus on their historical development and the current debates surrounding land based carbon offsetting initiatives and the potential within South Africa. Chapter 3 analyses the existing voluntary carbon standards focus on conducting a critical analysis of the current voluntary carbon standards for current market best practices and pitfalls of when designing a voluntary carbon certification process. This is then complimented in Chapter 4 by a critical analysis of the development and the lessons to be learnt from other current voluntary environmental certification systems (such as the FSC, MSC and ISO 14000 systems). There is a particular focus on if the standards have managed to successfully certify projects and add to the assurance of sustainable development benefits.

Part 2 comprises of Chapter 5 and 6, which develops a South African specific SD assessment framework. This involves in an assessment of South Africa's developmental challenges and the development of indicators and a framework that can be used to address these. The aim of this chapter is to:

- Develop a preliminary list of SD indicators that can ensure the incorporation of SD consideration into the proposed South Africa voluntary carbon standard.

Chapter 6 combines all the lessons, ideas and processes developed in the previous sections in the development of a proposed South African voluntary carbon standard. This chapter sets out the proposed principles and processes that a South African landscape restoration project would have to abide by or undertake in order to obtain certification under the standard. The explicit aim within the chapter is to develop new and innovative processes that are tailored to a landscape restoration project in a South African context but that have a focus on efficiency and cost-effectiveness in order to reduce the barriers to entry into the market for these projects.

Part 3 includes Chapter 7 and serves the function of concluding the entire thesis and attempting to illustrate what is required to potentially operationalize the proposed standard in the future.

Part 1:

Identifying the Lessons to be Learnt in Certification Design

Chapter 2:

Carbon Markets, Certification and Landscape
Restoration: A Review

2.1. Purpose of Chapter

The concept of payment for ecosystem services, in particular that of the carbon markets, requires an analysis for this thesis. This chapter aims to fulfil this by conducting an extensive literature review surrounding the main topics of payment for ecosystem services, carbon markets and landscape restoration projects.

2.2. Development of Payment for Ecosystem Services (PES)

The PES method is becoming ever more important and prominent in order to highlight and place a value on the ecosystem goods and services provided to humanity (Gomez – Baggethun et al., 2010). It is an area of study that can effectively mainstream the concept of ecosystem functioning, and the vital goods and services they provide, into the dominant global market based economy. The origins of the PES concept arose in the late 1970s (Westman, 1977; Ehrlich and Ehrlich, 1981) as the “framing of beneficial ecosystem functioning as services so as to increase public awareness in biodiversity conservation” (Gomez – Baggethun et al., 2010). Economists argue that the true values of ecosystem services are not captured in current market prices due to their nature of them being positive externalities or public goods (Corbera et al., 2007). As a result of this their true value is not accounted for by economic actors, and thus they are not incorporated into decision making processes and as such there are no incentives for conservation (Corbera et al., 2007). Markets for ecosystem services have been suggested and developed as effective and efficient strategies to internalise the externality into decision making processes, and thus create economic opportunities for resource managers while enhancing resource management and reducing rural poverty (Corbera et al., 2007). PES schemes are expected to provide an equitable distribution of their economic and social benefits, while being more effective than government led conservation schemes due to their economic considerations (Pagiola et al., 2005).

The interest in mainstreaming ecosystem services into the global economy has been evident in the rapid rise of literature dealing with issues such as the effective valuation of ecosystem services (Costanza and Daly, 1992; Daily et al., 1997), the most effective mechanism for pricing ecosystem services, and the addition of the concept into the policy making agenda. The paper by Costanza et al. (1997) “The value of the world's ecosystem services and natural capital” caught the imagination of policy makers and the public by placing an explicit value

of US\$ 33 trillion per annum on the contribution of the world's ecosystem services to human livelihoods. The Millennium Ecosystem Assessment (2005) process allowed for the idea of ecosystem services to become firmly entrenched in the policy formulation agenda. This has spurred a rapid growth in the identification and development of market based mechanisms that can be used to place an accurate price on ecosystem services. Ecosystems services that have been actively valued in monetary terms range from carbon sequestration and watershed services to biodiversity conservation and landscape beauty (Pagiola, 2008). This has allowed the concept of ecosystem services to transcend the academic arena into areas of policy development, non-governmental organisations (NGOs), private and financial institutions (Gomez – Baggethun et al., 2010). However Peterson et al. (2010) notices that this has prompted a move of the concept away from that of increasing debate on conservation issues to one of a commoditisation of vital ecosystem functioning with an increased emphasis on cash generation within new market driven economies.

Redford and Adams (2009) point out that PES schemes are being developed, adopted and implemented at a rapid rate. However these are often combined with a lack of critical debate surrounding their true purpose, potential application and gaps within the successful development of a market. This has caused the development of ecosystem service marketplaces to evolve on a separate path divergent from which the concept was originally formulated. Many critics have raised concerns regarding the utilitarian framing of ecosystem functioning and the way that humans relate to and perceive nature might be negatively affected in the long run (Kosoy and Corbera, 2010). Proponents of PES schemes argue that the degradation of ecosystems can be alleviated through the transference of funds from 'consumers' of the ecosystems service to 'providers' of the service. This will establish a new 'urban – rural' compact which can both restore and preserve ecosystem functioning while alleviating poverty (Kosoy and Corbera, 2010). This approach highlights the idealistic, neo-classical economic situation of a willing buyer-willing seller scenario of a defined, quantifiable commodity. It does however exclude the complexity associated with PES schemes that operate under different principles, with ill-defined ecosystem services or inefficient provision levels (Muradian, et al., 2010). To address the myriad of criticisms surrounding the conceptual ideal of PES schemes it is vital to work within current economic, political and social systems to establish a framework that effectively places ecosystems and their functioning at the forefront of policy making, social consciousness and economic decision making. This in turn will allow for the preservation, restoration and continued

benefits to be accrued from the Earth's vital life support systems, while contributing to the upliftment of rural economies and communities.

2.3. PES Market Development

Recent years have seen the emergence of the 'big three' PES markets worldwide, namely climate change mitigation (carbon), watershed services and biodiversity. The largest of these, that carbon market, has been accelerated by the threat of climate change and has become the market for the buying and selling of carbon credits to mitigate CO₂ emissions, measured in metric tonnes of CO₂ equivalents (mtCO₂e). This has allowed for large CO₂ emitters to reduce or mitigate their emission through either buying or selling carbon credits. This market has split into two distinct paths, namely the mandatory and voluntary carbon markets. The mandatory market is governed by the Kyoto Protocol (KP), while the voluntary market has developed mainly as a result of corporate social responsibility funding of projects. The market for carbon has been developing since the 1990s with the first voluntary reforestation program of 50 million trees in Guatemala undertaken by a large American power company, Applied Energy Services (AES) (Galatowitsch, 2009). This project was devised as a way to offset harmful emissions from a newly constructed coal fired power plant, and won regulatory approval. AES became the first official investor in the carbon market and highlighted the vital role that markets could play in generating financing for reducing carbon emissions and facilitating the rise of the 'new carbon economy'.

2.4. Sustainable Development and the New Carbon Economy

There has been much debate whether the rise of the new carbon economy will bring about a concurrent rise in meeting sustainable development goals. The clean development mechanism (CDM) has the double objective of assisting Annex 1 countries to meet their emissions reduction targets and to contribute to sustainable development within the host country (Sutter and Parreno, 2007). However Sutter (2003) identified a trade-off between these two objectives as cost-efficient emissions reduction practices are in direct conflict to sustainable development (SD) objectives. This is reaffirmed within the Marrakech Accord that states that "it is the host Party's prerogative to confirm whether the CDM project activity assists it in achieving sustainable development" (Boyd and Schipper, 2002). This has led to formulation of The Designated National Authorities (DNA), whose role is to recommend CDM projects to the CDM Executive Board (CDM EB) and develop their own criteria for SD for CDM

projects in their own countries (Sutter and Parreno, 2007). This freedom could serve as a perverse incentive for non-Annex 1 countries to set lower or weaker SD criteria to attract investment from Annex 1 countries, and thus defeat the objectives of incorporating SD considerations. Olsen (2007) argues that the absence of international SD standards is going to cause the move towards the most cost efficient project and not the most beneficial project.

Adger et al. (2001) found that the implementation of global environmental policies, such as the development of carbon markets, have great difficulties in incorporating local ecological and social realities, particularly at a local scale. Brown and Corbera (2003) argue that this is a result of carbon markets being forced into existence and not spontaneously emerging, this they argue might result in changes to local level rights, such as property rights. Bond et al. (2007) identify a form of “carbon colonialism” where land is expropriated from communities in developing countries to plant monocultures purely to offset carbon emissions from developed countries, subsequently contributing to biodiversity destruction, livelihood loss and access to water. Historically the CDM has tended towards low – cost, high volume projects such as methane gas capture or hydro fluorocarbon (HFC) destruction projects which have very few benefits for local livelihoods and biodiversity. The bureaucratic process of getting projects approved has driven small, community based projects out of the CDM, and allowed for the majority of projects being situated in the larger developing economies of China and India (Cosbey et al., 2005). The carbon market however does have the potential to contribute to sustainable development goals, through the development of projects that incorporate and respect the ecological and social systems in which they are situated.

The concurrent rise of the voluntary carbon market has gone some way to address the concerns generated from the CDM and sustainable development. The theoretical lack of bureaucracy within the voluntary market allows for increased investment in smaller scale, community based projects with their associated the co-benefits, such as increased biodiversity or job creation (Taiyab, 2005).. The new carbon economy is a mechanism that can be used to engage and mobilise the private sector to gain capital for smaller scale projects and thereby channel it towards SD and environmentally friendly activities (Brown and Corbera, 2003), such as landscape restoration projects. This is substantiated by Galatowitsch (2009) who argues that carbon trading has become much more than just a business transaction, by investing in projects with popular appeal the company will be recognised for their social and environmental responsibility. This funding could be used to support forestry and biodiversity

protection or restoration activities, as well as bringing a variety of sustainable development co-benefits such as diversifying rural economies and promoting sustainable resource management.

2.5. Carbon Markets – Mandatory and Voluntary

Currently, investors or Annex 1 countries can purchase offset reduction certificates through two markets, the mandatory and voluntary market. In 2009 the entire carbon market (mandatory and voluntary) was valued at around US\$136 billion (Hamilton et al., 2009) and has increased decreased to US\$ 14.9 billion in 2010 but still with 95% of trade taking place within the mandatory market. While the voluntary market is relatively small it still resulted in a market value of US\$705 million in 2008 (Hamilton et al., 2009). However, in 2009 the voluntary carbon market was dramatically affected by the global economic recession and this led to a decline in the total value of voluntary credits to US\$415 million (Hamilton et al., 2010). The trading year of 2010 has seen a rebound by corporate social responsibility buyers after reclaiming their money from the recession to US\$ 424 million (Peters-Stanley et al., 2011). This is still some way behind the record trading volume of US\$705 million recorded in 2008 (Hamilton et al, 2009). However, average credit prices fell slightly from US\$6.5/t CO₂e in 2009 to US \$6/t CO₂e.

Within the mandatory market, under the CDM, demand is driven by compliance buyers from developed countries, in particular Europe, purchasing certified emissions reductions (CERs) from developing countries as offsets (Galatowitsch, 2009). CERs are the unit of emission reduction measurement issued by the CDM for emissions reductions achieved by a CDM project that have been verified by a third party designate operational entity (DOE). The majority of emissions reduction projects currently registered under the CDM result from energy industries (renewable/non-renewable energy) (62%) and waste handling and disposal projects (17.5%) (UNFCCC, 2010a). A similar trend is visible in the voluntary markets with the majority of voluntary offsets coming from renewable energy projects with a 51% market share; mostly from hydropower (32%), wind energy (15%) and biomass energy (3%) (Hamilton et al., 2009). Asian countries have been dominating carbon markets (Figure 1.1) with projects within the Asia/Pacific region accounting for 76% of all registered CDM projects up until 2010 (1692 of 2216), China and India alone account for 61% of these. On the voluntary market Asia once again dominates and was a source for 45% voluntary emissions reductions (VERs) of offset certificates traded in the over-the-counter market

(OTC), the largest VER market (Hamilton et al., 2009). A VER is the generic unit of emissions reduction measurement that has been assigned to a project that has been successfully certified under a voluntary carbon standard.

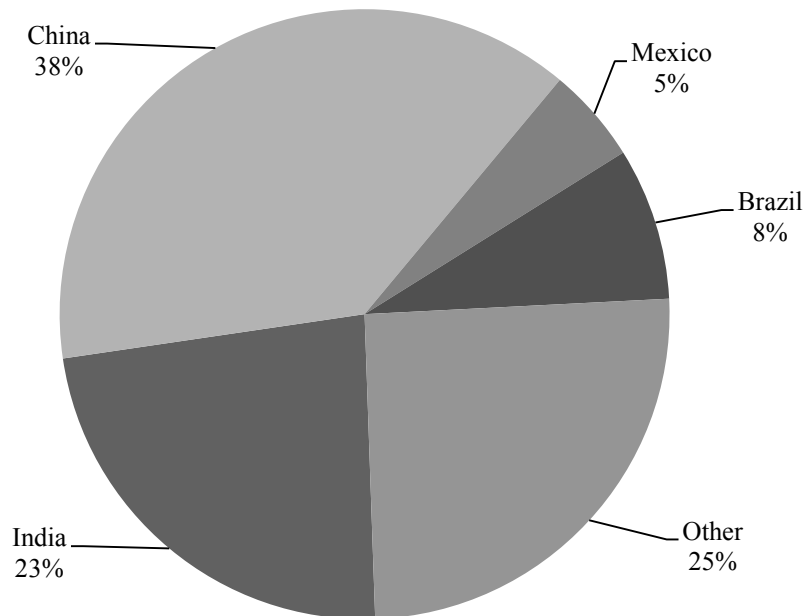


Figure 2.1. CDM projects by host country (UNFCCC, 2010a)

The general approach to carbon credit trading in all markets is on a project by project basis and it is up to the seller to verify the stability and permanence of the emissions reduction (Galatowitsch, 2009), this is mainly achieved through attaining independent, third party, project certification. Certification occurs in the in the mandatory market via abiding by the principles and criteria within the CDM. While in the voluntary market certification is obtained by complying with the criteria outlined in the varying independent certification bodies. The carbon credits may then be sold to investors in two ways, 1) they may be sold directly in the OTC market; or 2) on to intermediate parties, such as brokers, aggregators or retailers which can then be sold on formalised markets, or the regulated markets (in terms of the CERs) such as the European Union Emissions Trading Scheme (EU ETS).

2.6. Mandatory Markets

2.6.1. Kyoto Mechanisms

The KP includes the CDM and JI as flexible mechanisms to offset GHG emissions from Annex 1 countries. All developed countries, with the exception of the United States of

America (USA), have ratified the KP (Olsen, 2007). The majority of developing countries have also ratified it as they hope to be able to host CDM projects and capture the associated benefits attached to the projects (Sutter and Pareno, 2007). The primary CDM market, or the direct purchase of CERs from on the ground projects market, was responsible for 404 Mt CO₂e and the secondary CDM market accounted for 1055 Mt CO₂e in 2010 (Linacre et al, 2011). To achieve CDM certification and thus participate within the mandatory market stringent guidelines and processes relating to the full life cycle of the project have to be met (Galatowitsch, 2009). As a result it is often a barrier of entry for many smaller projects or ones that exist within developing countries.

2.6.2. European Union Emission Trading Scheme (EU ETS)

The EU ETS is the largest multi-national emissions trading scheme in the world and is major pillar of the Europe's climate change policy as it is linked to their Kyoto targets (Watanabe and Robinson, 2005). National emissions caps have been set by the EU member states which are in accordance with their Kyoto obligations. Each large CO₂ emitter is allocated an assigned emissions amount and they must monitor and report their annual CO₂ emissions. Their annual emissions are compared against their assigned amount and they must return an amount of emissions reduction certificates that are equivalent to their CO₂ emissions that year. The EU ETS offers three mechanisms to trade and reassign credits: 1) in the private market between operators, 2) the OTC market and 3) trading on the spot market such as the European Climate Exchange. Currently the EU ETS does not include VERs and only recognises the use of regulated carbon credits from the United Nations Framework Convention on Climate Change (UNFCCC) certified projects in the form of CERs (Watanabe and Robinson, 2005). All 27 European Union (EU) member states and three non EU countries (Norway, Iceland and Lichtenstein) are regulated by the EU ETS. All the companies with significant emissions within these countries are capped. In Phase 1, more than 12,000 installations were regulated and this accounted for 40% of all EU GHG emissions. This has made the EU ETS the most active and largest market for carbon credits, and was responsible for offsetting 6, 326 Mt CO₂e in 2009 (Hamilton et al., 2010). In 2010 The EU ETS continued to grow, reaching US\$119.8 billion worth of trades (Linacre et al., 2011).

2.5.3. Compliance trading outside the Kyoto Protocol

There are a number of binding cap and trade systems that follow similar models to the KP or EU ETS but are not specifically aligned to it. These take the form of regional cap and trade schemes that are aimed at reducing GHG emissions from specific sectors or industries, mainly the energy sector.

The largest one of these is these is the Regional Green House Gas Initiative (RGGI) which is a multi-state regional cap and trade program for the power sector in the Northeast USA. The RGGI began in 2009 and was the first mandatory cap and trade system to regulate GHG emissions in the USA and is currently responsible for offsetting 71.5 Mt CO₂e of GHGs (Hamilton et al., 2010). Other cap and trade programs that have developed include the New South Wales Greenhouse Gas Reduction Scheme, the Alberta Specified Gas Emitters Regulation, and the Western Climate Initiative. As these markets are regional specific they are relatively small with RGGI being the largest of them all, followed by the New South Wales Greenhouse Gas Reduction Scheme which accounts for offsetting 30.8 Mt CO₂e (Hamilton et al., 2010)

2.7. Voluntary Markets

The AES deal was the initiator of the development of the voluntary carbon market. The voluntary market has grown as a result of private organisations participating in GHG mitigation and seeing carbon trading as much more than a business deal (Galatowitsch, 2009). The voluntary carbon market however has only been formally recognised since 2005. Despite being relatively new these projects have come to be recognised for their marketing potential due to the social and environmental benefits that are often related to offsetting GHGs (Galatowitsch, 2009). Buyers of VERs are generally organisations, governments, individuals and other entities and this is done not just for regulatory compliance but is driven by corporate social responsibility initiatives and personal behaviour (Curran and Shackleton, 2009). This has caused the demand for projects have proven SD to be in high demand. As the voluntary market has begun to grow it has split into two distinct paths: the Chicago Climate Exchange (CCX) and the over-the-counter (OTC) market (Hamilton et al., 2009).

2.7.1. Chicago Climate Exchange (CCX)

The CCX was an offset market in North America that encourages participants to voluntarily sign up, but once affiliated they face legally binding emissions reduction targets (Sandor et

al., 2002). These members could then meet their targets by: 1) cutting their emissions internally; 2) trading emission allowances with other CCX members; or 3) purchasing offsets generated under the CCX offset program. This market was worth US\$ 306.7 million or 69.2 Mt CO₂e in 2008 but due to the recession experienced a 73% decline in prices, and coupled with a reduced volume of offsets within the market this led to an 84% reduction in the overall value of the CCX (Hamilton et al., 2010). This has led to the closure of the formal CCX and has led to a gap in transaction volumes. It is predicated this could be as high as 30Mt CO₂e/year and is partly responsible for the lower average price experienced in the voluntary market for 2010 (Peters-Stanley et al., 2011).

2.7.2. Over-the-Counter market (OTC)

The OTC market includes all transactions that occur on a project by project basis, between a willing buyer and a willing seller (Galatowitsch, 2009). The OTC market has become the largest voluntary market in terms of monetary value of US\$ 396.7 million or 56% of the voluntary market in 2008 at an average of US\$ 7.34 /t CO₂e. In 2009 however the OTC market fell slightly to a value of US\$ 326 million, while still maintaining a price premium per credit over the CCX of 81% (Hamilton et al., 2010). In 2010 there was a rebound to US\$414 million and the trading of 128 Mt CO₂e (Peters-Stanley et al., 2011), making it the largest source of trading within the voluntary markets.

The voluntary market does not abide by any legally binding caps, therefore any institution, business or individual can offset their GHG emissions. This has allowed a large variety of organisations and projects to sell VERs under their own systems and under a variety of conditions (Peskestt et al., 2007). This has led to a number of criticisms of VERs due to their lack of transparency and uniformity. This has in turn caused uncertainty in the market; due to potential investors unsure that their investment will yield credits of a high standard (Galatowitsch, 2009). To prove legitimacy of projects a number of tools have been developed. These take the form of carbon standards that independently certify and verify that emissions reductions are real, reliable and permanent and thus provide the much needed additional information to potential investors surrounding the offsets that they purchase.

2.8. The Voluntary Carbon Market and Voluntary Carbon Standards

The rise of the voluntary market and the resulting voluntary certification systems has the overarching goal of opening up the carbon market to a wider range of participants and

reducing the transaction costs of complying with the strict CDM regulations (Hunt, 2008). Voluntary carbon standards are developed by independent organisations that compile their own criteria, indicators and measurements for emissions reduction practices. This however does not imply that a certified VER is in any way less effective than a CER.

The lack of regulation within voluntary markets has led to the rapid growth of differing standards developed by different organisations. Third party verification is increasingly being seen as vital to the legitimacy of projects; this has led to over 90% of voluntary offset projects being certified to a third party standard (Hamilton et al., 2010). All these standards however use a different mechanism to demonstrate that offset projects are real, reliable and permanent. As a result there is a massive discrepancy between the qualities of offsets, both in terms of GHG offsets and sustainable development benefits (Merger and Williams, 2008). Sustainable development co - benefits are no longer being seen as vital to offset standards, as the focus has become one of supplying cheap credits. Standards are now being distinguished between minimum standard offsets versus ‘gourmet’ offsets, or those which follow strict standards of additionality and sustainable development co-benefits (Peskest et al., 2007; Galatowitsch, 2009). This has led to credits with certified sustainable development benefits being seen as extraordinary and a premium, rather than all standards abiding by the principles around which the carbon market was originally envisioned and developed.

The concept of additionality has become the most fundamental and disputed area of developing a reliable carbon offset standard from a GHG perspective (Kollmuss et al., 2008). The concept of additionality asks the question: “would the project have occurred, holding all else constant, if the activity was not implemented as an offset project?” (Kollmuss et al., 2008). If the answer is “yes” then the project is not additional. The argument is that investing in an offset project that would have happened anyway causes the emissions to have not been neutralised but the investor has merely subsidised an activity that would have happened anyway (Kollmuss et al., 2008). Additionality forms an integral part of reliability of a project’s offsetting credentials due to it forming part of ensuring the environmental integrity of projects. Additionality is however incredibly difficult to measure and determine in practice, this has led to the varied methods, and discrepancies between standards, in attempting to determine the additionality of projects’.

Social and environmental impact procedures also vary widely among standards. Many have been criticised for their focus on purely offsetting GHGs while neglecting SD co-benefits, or

even for harming social or ecological systems (Peskest et al., 2007). Standards have been criticised for ignoring impacts to endangered species, water quality and soil loss (Galatowitsch, 2009), or social factors such as loss of access to land by rural communities and loss of income from displaced employment (Peskest et al., 2007). Differences within the voluntary market are further exacerbated by the motivations of project developers and implementers. There are those that focus purely on developing projects that represent GHG offsets that can be sold for a profit in the market and then those that aim at providing SD co-benefits that strengthen livelihoods and restore ecosystem functioning.

There are currently sixteen recognised independent standards covering the voluntary market (Hamilton et al., 2009). The standards differ in three main ways, 1) the primary objective of the standard, 2) the structure and assessment process and 3) scope, as standards can apply to all manner of emissions reduction practices. Furthermore some standards focus only on certain project types, from energy efficiency to renewable energy, methane/carbon capture and storage and Land-use, Land-use Change and Forestry (LULUCF) projects (Kollmuss et al., 2008). The standards all differ in terms of structure and the inclusion of the three components of 1) GHG accounting standards; 2) monitoring, verification and certification standards; and 3) registration and enforcement standards. This allows standards to be separated into five categories: full-fledged carbon standards, project design standards, offset standard screen, offset accounting protocols and other standards types (Kollmuss et al., 2008). The seventeen standards can be seen in Table 2.1.

2.8.1. Fully fledged carbon standards

These standards include all three components of a carbon offset standard. They include rigorous methods for accounting for GHG reductions. The standards detail the criteria, indicators and measurements that allow for a process of monitoring, validating, verifying and certifying of a project's stated GHG reduction and, if included in the standard, their contribution to sustainable development. They also record and ensure the registration of all offsets associated with projects so as to avoid the double counting of offsets. Examples of such standards include the Verified Carbon Standard (VCS) and Gold Standard (GS).

2.8.2. Project Design Standards

These standards aim to guide project developers in the initial design stage of the project. These aim to set out what projects need to do in order to achieve certification surround a

particular aspect, mainly sustainable development. Often these relate to the processes and actions that need to be taken into account to ensure that the project meets sustainable development criteria. The example of this type of standard is the Climate, Community and Biodiversity Standard (CCBS). This often needs to be combined with a full-fledged carbon standard (e.g. VCS) to obtain certification and access to a registry (Kollmuss et al., 2008).

2.8.3. Offset Standard Screens

The Voluntary Offset Standard (VOS) is currently the only offset standard screen. It works by accepting projects that were implemented under other standards' procedures and guidelines. Currently the VOS accepts projects under the Gold Standard (GS) VER and projects that employ CDM methodology, but are implemented within countries that are not signatories to the KP (Kollmuss et al., 2008).

2.8.4. Offset Accounting Protocols

These standards provide the procedure that purely accounts for GHG reductions from offset projects. They have specific rules for reviewing, validating and registering offset projects but they do not define eligibility criteria. Often fully fledged standards are based on these protocols, such as the VCS which uses the ISO-14064 GHG methodologies.

2.8.5. Other Standard Types

This accounts for all the standards that do not fit into the above categories. These are often the smaller standards that are project specific. Examples include Plan Vivo and Brazils Mata Viva (BMV).

Table 2.1. Voluntary Carbon Standards and their Classifications

Fully Fledged Carbon Standards	Project Design Standards	Offset Standard Screens	Offset Accounting Protocols	Other Standard Types
Gold Standard (GS)	Climate, Community and Biodiversity Standard (CCBS)	Voluntary Offset Standard (VOS)	ISO 14064	Plan Vivo
Verified Carbon Standard (VCS)	SocialCarbon (SC)	Green-e	WRI WBCSD / GHG Protocol	Mata Viva (BMV)
VER+				
Climate Action Reserve (CAR)				
American Carbon Registry (ACR)				
CarbonFix				
Chicago Climate Exchange (CCX)				
Panda Standard				

Of the sixteen existing standards/protocols, ten explicitly aim at incorporating co-benefits from projects into the certification process (Hamilton et al., 2009). These include four fully fledged standards (GS, ACR and CarbonFix and Panda Standard), the two project design standards (CCBS and SocialCarbon) as well as the Plan Vivo and BMV standards. This is in spite of purchasers of VERs indicating that their main reasons for purchasing carbon credits is for public relations/branding and corporate social responsibility programs (Kollmuss et al.,

2008). To achieve this purchasers' seek projects that are certified providers of SD co-benefits; this has made standards such as CCBS highly desirable in the market (Neef et al., 2010).

This rapid development of third party standards and the contrasting criteria of each has introduced complexity into the market for both potential project developers and investors (Peskett et al., 2007, Merger and Pistorius, 2011). The difference between the standards has sometimes called into question the quality and legitimacy of some offsets, and as yet there is no single prevailing set of industry best practices (Galatowitsch, 2009). This has damaged confidence within the voluntary market as investors and project developers are unsure of which standard will provide them with the most accepted and recognised certification procedure and thus either the highest price or guaranteed generation of offsets (Merger and Williams, 2008).

The lack of universally accepted standards for project eligibility, accounting for offsets, verification and monitoring have led to calls for a reduction in the number of standards currently used (Peskett et al., 2007). It is hoped that market forces will cause this to happen as purchasers will naturally exhibit their preferences for certain standards. Peskett et al. (2007) urges caution in restricting the design and implementation of new standards as offsetting GHG emissions requires new innovative process and technologies that will require market adaptation and understanding. It is this that could lead to slower market growth and hence reduction of GHGs but in the future it will lead to projects with greater GHG reduction capabilities and increased sustainable development benefits.

2.9. Landscape Restoration and the Voluntary Carbon Market

The KP explicitly aims to facilitate the restoration of degraded forests as landscape level restoration has a high potential to achieve both poverty alleviation and biodiversity restoration (Lamb et al., 2005). However LULUCF projects have been lacking in CDM markets; prior to 2009 the CDM only had one registered Afforestation /Reforestation (A/R) project, whereas in 2009 nine new projects were registered (Neef et al., 2010). This can be seen as a discouraging failure of the CDM as it had only approved ten projects out of 2236 by 2010. LULUCF projects have also been the perennial under-achievers in the voluntary markets, and they have seen a decline in popularity over the last few years from having a 26% market share in 2006, 16% in 2007 and 11% in 2008 (Hamilton et al., 2010). This is

despite the fact that corporate buyers of VERs have a highly positive attitude towards forest carbon offsets (Neef et al., 2010). However, 2010 saw a dramatic rebound in the popularity of LULUCF based credits with the development of new methodologies and projects around Reduced Emissions from Deforestation and Forest Degradation (REDD), accounting for 46% of transactions in the voluntary OTC market (Peters-Stanley et al., 2011).

There is increasing evidence that land based sequestration and conservation initiatives have one of the greatest potential for CO₂ mitigation then other projects such as methane gas capture or hydrofluorocarbon-23 (HFC) destruction (Righelato and Spracklen, 2007).

Locking up carbon through bio-sequestration initiatives in the Earth’s terrestrial biosphere is as seen as one of the most immediate options available to offset GHG emissions (Malhi et al., 2002).

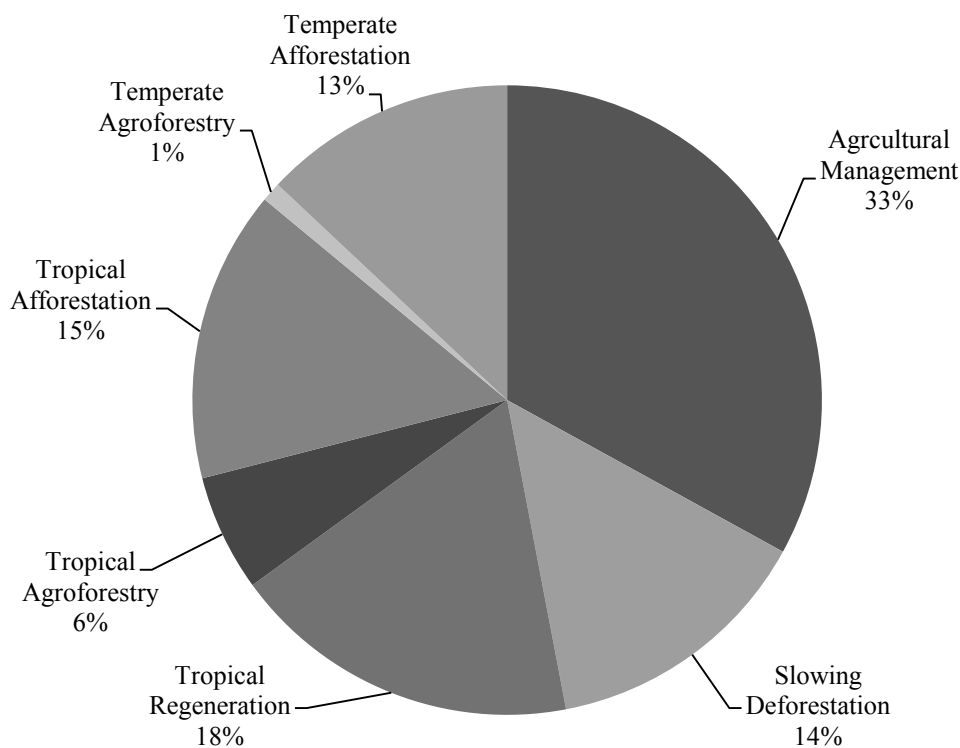


Figure 2.2. The potential of various land management activities to increase the carbon sink of forestry or agriculture practices (Malhi et al., 2002).

Landscape restoration and afforestation practices have the potential to contribute to 28% of LULUCF’s contribution to GHG mitigation and this potential is beginning to be increasingly recognised (Figure 1.2) (Malhi et al., 2002, Galatowitsch, 2009). It is argued however that the

managed absorption of CO₂ in forests must be used over the next few decades, but it has been done in combination with increased use of technology, efficient energy use and new forms of energy supply to achieve a true reduction in global GHG emissions. There have been conflicting arguments around the effectiveness of different projects with Lackner (2003) arguing that in the short term the most effective way of combating GHG emissions is through the use and development of existing technologies, while Lal (2002) argues that bio-sequestration initiatives have a significant role to play in the development of the new carbon economy. This has been highlighted by Pearce (2001) and Sathaye and Andrasko (2007) who state that carbon sequestration is the most valuable ecological service provided by forests.

There is increasing political will, motivation and commitment surrounding LULUCF projects and the acknowledgement of the need to halt deforestation. The political will and potential increase in land based offset projects is highlighted in the prominence they are playing in current policy documents and discussions, for example the Copenhagen Accord states:

“We recognize the crucial role of reducing emission from deforestation and forest degradation and the need to enhance removals of greenhouse gas emission by forests and agree on the need to provide positive incentives to such actions through the immediate establishment of a mechanism including REDD-plus, to enable the mobilization of financial resources from developed countries”. (UNFCCC, 2010b)

They still however face a number of challenges to certification and the historical reasons for failure of LULUCF are both varied, but similar within both markets and serve as significant barriers to investment, they are: 1) high transaction costs and lag times surrounding the generation of credits (Marais et al., 2007; Galatowitsch, 2009); 2) complex baseline and monitoring methodologies and accounting uncertainty (Peskett et al., 2007); 3) bureaucratic and complex stakeholder interactions (Marais et al., 2007, Neef et al., 2010) and 4) the risk of investing in developing countries (Neef et al., 2010).

2.10. Afforestation/ Reforestation, Landscape Restoration and Voluntary Carbon Standards

The drive to increase investment in carbon forestry activities and the increasing uncertainty surrounding legitimacy of projects has called into question both the CDM certification and the voluntary certifications processes. Universally accepted standards for project methodologies, additionality, carbon accounting, verification and monitoring do not exist (Galatowitsch, 2009). The CDM sets out its own procedures that were developed during

Kyoto negotiations. These relate to the entire life cycle of the project and include key documents that have to be completed, such as a Project Design Document (PDD) that requires social and environmental impacts of the project to be assessed (Peskest et al., 2007). The certification procedures within the voluntary market are more variable due to the lack of a single regulatory body. As mentioned earlier, the standards vary between trading mechanisms as well as their own procedures for assuring the quality of offsets provided, both in terms of their potential to mitigate GHG emissions and their sustainable development criteria (Pesket et al., 2007).

The Forest Carbon Offsetting Report 2010 by Neef et al. (2010) highlights the importance of carbon standards to investors, with 89% of market participants indicating that carbon standards play an important factor when purchasing forest carbon offsets (Neef et al., 2010). This is corroborated by Peskest et al. (2007) who state that clear standards for carbon offsetting can increase confidence in carbon markets and assist buyers in making purchasing decisions while helping to guarantee development benefits.

Organisations developing standards have recognised this and as such twelve of the offset standards make LULUCF projects eligible for certification, these are the CCBS, VCS, CAR, ACR, CarbonFix, Plan Vivo, Social Carbon, VER+, CCX, Panda Standard, Mata Viva and VOS. There are a number of these that have been designed to focus specifically on A/R projects, the four most widely used are CarbonFix, Plan Vivo, CCBS and VCS Agriculture, Forestry and Land Use (AFOLU) standards (Merger and Williams, 2008). However these standards have been severely lacking in the number of projects certified, credits registered and traded. CCBS has validated the highest number of projects with 21, and has 26 projects currently undergoing validation (www.climate-standards.org) making the CCBS the most popular project design standard, but as CCBS is only a project design standards there is no registration process. In contrast fully fledged carbon standards have been woefully behind in developing, registering and generating carbon credits from A/R activities. The largest fully fledged standard for A/R activities is currently Plan Vivo with ten projects at various stages of registration, with only four registered projects currently generating tradable carbon credits (www.planvivo.org). CarbonFix currently only has six projects certified or undergoing certification, with only one registered. VCS AFOLU has been a dramatically late starter and the first AFOLU project methodology was only accepted by the VCS board in May 2010, and

as VCS is the most popular standard for voluntary carbon offsets this has severely hampered the growth of the market.

The potential of landscape restoration projects to sequester carbon has been widely reported and discussed (see section 2.9). Corbera et al. (2009) conducted a study into PES systems within Mexico which are specifically focused on payments for carbon, biodiversity and agroforestry and it was found that rural people benefited financially, forests had been restored and institutional capital has increased. In contrast restoration on private land in developed countries has been found to not be viable with the sole funding source being the carbon market (Hunt, 2008). The reason for this could be that investors prefer projects located within developing countries to achieve compliance with KP regulations (CDM) or pre-compliance with future climate legislation. Project location has emerged as a key factor in determining the purchasing of A/R carbon offsets, developing regions of the world such as South America and Africa have emerged as highly desirable locations for investment in forestry carbon projects (Neef et al., 2010).

The lack of involvement of developing countries within voluntary markets, specifically with regards to A/R and landscape restoration project development, is a result of the significant barriers to entry for small scale community projects (Galatowitsch, 2009). These are specifically related to the costs involved in obtaining certification for carbon offsetting projects and the risks associated with investing in developing countries. The average costs of obtaining CDM certification is estimated to be between US\$ 40,000 to US\$ 300,000 in 2006 (UNDP, 2006) and in current South African Rand prices (US\$1: R8) that would be between R320, 000 to R2, 4 million, not accounting for inflation. Small scale projects usually incur costs of between US\$ 40,000 to US\$ 90,000 within the CDM process (UNDP, 2006). One of the most popular voluntary standards, CCBS, adds up to R32,000 - R64,000 (US\$ 4,000 – US\$ 8,000) on top of CDM costs (Peskett et al., 2007). Lopes (2009) found that the costs vary little between standards and the determining cost factor in most projects is the scale of the project. Combine these with the significant investments required to develop the project adds large financial barriers for a project.

Balderas Torres et al. (2009) examined the factors that affect total sequestration costs at the Scolel Te carbon forestation project, Mexico and attempted to cost the actual price involved in implementing sequestration projects. Reported A/R implementation costs typically range from US\$ 1 to US\$ 8 per ton of C (which is equivalent to 3.67 t CO₂e) (Balderas Torres et

al., 2009). Richards and Stokes (2004) highlighted that these values are difficult to compare due to inconsistencies in methodologies and assumptions. Balderas Torres et al. (2009) state that the voluntary markets have the ability to incorporate rural areas in the carbon market much more effectively as a result of their lower transaction costs. They also prefer *ex-ante* carbon accounting methods in the voluntary markets, where all of the carbon offsets are awarded at the initiation of the project based on anticipated future carbon sequestration and storage (Galatowitsch, 2009). *Ex-ante* credits are preferred as they allow for upfront funding to be generated and provide essential capital to project developers/ communities to ensure the development and success of the project (Galatowitsch, 2009).

REDD projects have been suggested as a potential alternative mechanism that can be used to halt the degradation of landscapes (Laurance, 2008). This is as a result of REDD requiring a change of mind sets and behaviour to halt landscape degradation. This has been put forward as a lot more cost effective than landscape scale restoration which requires large amounts of capital investment and labour (Olander et al., 2008). REDD projects also offer the opportunity for incorporating co-benefits into the process, thus making them appealing to investors, these have been dubbed REDD-plus projects. REDD activities are currently not recognised under CDM activities; however there is extensive lobbying and debate on their incorporation into a new global climate deal (Neef et al., 2010). This has led to the voluntary markets emergence as the area for the development of REDD/plus projects and trading. This is evident in the fact that the major role players in voluntary certification are releasing REDD project guidelines, such as CCBS (www.climate-standards.org), and the proposed VCS REDD guidelines (www.v-c-s.org). REDD is often seen as being in competition with other offset activities, but this does not need to be, it should be seen as another effective initiative that can be used in conjunction with other biophysical and technological angles that can be used to reduce and minimise the levels of GHG in the atmosphere.

Many of the current voluntary standards have pioneered the development of forestry based (both A/R and REDD+) projects due to the lack of acceptance and continued bureaucracy within the CDM and large compliance markets such as the EU ETS. They have been instrumental in developing new approaches to counter the oft seen stumbling blocks to forestry certification such as additionality testing, permanence mechanisms and co-benefit assessment methodologies. It has to be argued that for a LULUCF based project to be truly sustainable they should aspire to be as environmentally and socially ethical as possible. It's

within this distinction that this thesis sees the question between A/R versus landscape restoration.

Within this thesis it is acknowledged that A/R projects comprise the wide spread planting of trees on land that was once was, or has never been forest. It is these commercial forestry plantations and the evidence of various project failures (Bond et al., 2007) that has served to distort the true goals of land based bio-sequestration projects. It is for this reason that it is proposed within this thesis that the development of a proposed South African voluntary carbon standard serves to move away from A/R project definition. It will rather focus on developing a standard that aims to guide and certify landscape restoration projects within South Africa. This moves LULUCF carbon offsets and certification standards away from the industrial, commercial notion of monoculture plantations to the development of projects that contribute directly to sustainable development through restoring the functioning of ecosystems in an environmentally and socially ethical way.

2.11. South Africa and the Carbon Market

Africa, as a continent, only makes up 2% of the world carbon market for both regulated and voluntary markets (Filou, 2009). The opportunities associated with participating within the carbon market have not yet been capitalised on by African carbon project developers. As discussed earlier, the lack of implementing experience and the highly bureaucratic, costly system of the CDM process has served as a barrier to participation and thus Africa relies on the voluntary carbon market for access to carbon funding (Jindal et al., 2008). This is evident in that 46% of the current carbon projects in Africa are forestry based, and thus far forestry projects have been mostly excluded from regulated markets (Filou, 2009). However there has been an unequal distribution of voluntary carbon bio-sequestration initiatives as the majority of projects are based in Latin America or Asia (Jindal et al., 2008.) There are also fewer forestry based carbon projects in Africa than in any other developing regions of the world (Jindal et al., 2008).

South Africa is the leading carbon offsetting projects developer on the continent, accounting for 49% of registered African CDM projects. This however is an insignificant amount as South Africa's participation in the world carbon markets accounts for only 1%. This is evident in the protracted process of obtaining CDM certification for projects. There have been 136 projects submitted to South Africa's DNA and only 17 have so far been registered

by the CDM executive board but only 4 of these have been granted CERs for trade (Department of Minerals and Energy, 2010). These projects range from energy efficiency projects, e.g. the Kuyasa Low-Cost Urban Housing Energy Project, to nitrous oxide abatement schemes, e.g. the Sasol Nitrous Oxide Abatement Project, but to date not one LULUCF project has been submitted to the DNA (Department of Energy, 2011). Ethiopia has become the first country within Africa to register a large-scale forestry project with the CDM and this is encouraging as LULUCF activities are pivotal to increasing Africa's share in the carbon market (Jindal et al., 2008). This is also encouraging as mentioned earlier that forestry credits tend to be highly desirable on the market due to their potential for the inclusion of sustainable development benefits and this coupled with Africa's desirable location for carbon investors forces the average price up to between US\$5 – US\$10 per tCO₂e (Neef et al., 2010).

The World Bank has become a major funder of African forestry projects through its BioCarbon fund, which is a \$91m facility dedicated to carbon sequestration initiatives through forests and agro-ecosystems (World Bank, 2010). Engelbrecht et al. (2004) estimate that South Africa has the realistic potential to bio sequester 3 778 gigatonnes of CO₂ over a 30 year period but South Africa has so far failed to capitalise on this. The potential exists within South Africa for land based projects and coupled with the desirability of LULUCF projects to investors, high prices and the substantial sustainable development benefits, restoration initiatives should be at the forefront of South African carbon offsetting projects.

Chapter 3:

Analysis of Voluntary Carbon Standards for Best Practice Identification

3.1. Introduction

3.1.1. Purpose of Chapter

This chapter aims to gain a better understanding of the current voluntary carbon standards within the market. In particular there is an emphasis on the analysis of what constitutes a voluntary carbon standard. This is then used to conduct an analysis on selected standards for current market best practice and the lessons to be learnt. This is useful as the development of a proposed voluntary carbon standard for South Africa has the advantage of being able to learn from the existing market best practices. These can then be tailored to the local South African context to achieve the development of standard that ensures offsets are real, reliable and permanent.

3.1.2. Introduction

Ecosystem Marketplace, a leading carbon market watchdog states that “carbon standards are the cornerstone of any carbon market, because they define all the actions and outputs that constitute a *bona fide* emission reduction” (Ecosystem Marketplace, 2010). Chapter 2 (section 2.8) highlighted the complexity that has arisen as a result of the 16 competing voluntary standards developing differing criteria, indicators and measurements for determining carbon emissions reductions from projects. Even though each standard follows a similar basic structure, no two standards are alike (Table 3.1).

The analysis of current market players and standards in the development of a new voluntary carbon standard is vital. Crucial to this process is benchmarking, which Camp (1989) defines as the search for industry best practice that leads to superior performance. This is vital as it allows for in-depth analysis of the current industry and market competitors and enable for increased understanding surround their business practices and that the new ideas and processes developed match or exceed those of the competitors. This technique has been widely used and promoted within organisational learning literature, but Laise (2004) describe it as a process that has been used to promote imitation rather than innovation. Massa and Testa (2004) argue that it can be more than just a tool to promote imitation of best practices, but rather one that can be used to identify and promote continuous improvement and innovation through acquiring, creating and transferring knowledge that leads to modified behaviour and the generation of new knowledge. The benchmarking process is intended as a learning process that involves observation of external practices and performance, comparison

with current practices, identification of knowledge gaps and then bridging these gaps through either innovation or investment in knowledge generation (Massa and Testa, 2004). This process of observation and imitation is an important cognitive step that adds value to the final process. The integration of both the observed external actions with internal knowledge results in innovation, rather than just the imitation of existing practices (Massa and Testa, 2004).

There is a need to logically and systematically collect, analyse, modify and create knowledge (Hyland and Beckett, 2002) surrounding carbon market certification best practices. Kollmuss et al. (2008), Merger and Williams (2008), and Lopes (2009) have all analysed and compared a variety of voluntary carbon standards for different purposes and in a variety of ways. In 2008 the WWF (Kollmuss et al., 2008) conducted a general evaluation of eight voluntary standards to allow for a greater understanding of this new and developing market. Merger and Williams (2008) followed on from this and evaluated four standards particularly aimed at A/R projects, specifically to inform buyers of voluntary standards. Lopes (2009) followed this up with an evaluation of seven voluntary standards with the aim to develop a tool to evaluate voluntary carbon standards and inform the purchase of carbon credits. However, the rapid development of voluntary carbon standards has seen the release of new standards, as well as the review and updating of existing standards. This calls for a new comprehensive evaluation of carbon standards in 2011 and the development of a technique that can be used for future comprehensive, rapid evaluation and benchmarking.

To successfully develop a new and competitive voluntary standard for South Africa, it needs to incorporate the overarching market best practices. This needs to be done for the standard to become a recognised and accepted for the quality of its offsets. This is not to say that this study must and will emulate existing practices, rather it be based on the knowledge gained from this benchmarking process, and modified and tailored to South African conditions. This will allow for the concentration and the pursuit of maintaining offset and project integrity, while striving for increased efficiency and the reduction of costs while using benchmarking the standard against current market participants and practices.

3.2 Methods and Process

3.2.1. Selecting Evaluation Criteria

As discussed, voluntary carbon standards often have differing aims and focuses, especially with regards to the project types accepted for certification. These project types often require

different certification criteria due to the inherent differences between them e.g. landscape restoration and renewable energy.

To assess voluntary carbon standards against the criteria that compose the certification of an A/R or landscape restoration project an extensive and detailed set of criteria is needed. A broad list of criteria was identified from Kollmuss et al. (2008), Merger and Williams (2008), Lopes (2009) and Walter and Kahlert (2010). These were then evaluated for applicability and feasibility and a final list was generated. The final criteria that were used for evaluation were divided into two sections of essential and variable criteria (Table 3.1). The ‘Essential Criteria’ are those criteria that ensure an offset is real, reliable and permanent and can be evaluated, re-designed and altered to achieve this. The ‘Variable Criteria’ relate to the criteria that will not affect the overall evaluation, as they can either not be directly determined (e.g. Price of offset) or have a little effect on the final evaluation of standard (e.g. Project Location). The final list can be in Table 3.1:

Table 3.1. The Components of a Voluntary Carbon Standard

Essential Criteria	Variable Criteria
Baseline (BAU)	Type of Credits
Additionality	Project Location
Leakage	Project Types (Eligibility)
Permanence	Cost of Certification
Co-Benefits	Price of Offsets
Transparency	
Registry	
Public Participation	
Third Party Auditing	
Field Verification Frequency	

These criteria were then defined and interrogated to obtain a greater understanding surrounding the current debates and issues on voluntary standard criteria and development. To obtain a greater understanding of each individual standard: the histories, type of standard, essential and variable criteria were all investigated, analysed and detailed (Table 3.4).

3.2.2. Selecting Standards for Review

Standards were selected based on the availability of guideline documents and their applicability to the identification of best practices. Of the 16 standards initially identified the ‘Offset Standard Screens’ were excluded from the review process as they offer a certification

process of existing voluntary standards and ‘Offset Accounting Protocols’ were excluded as they only include techniques for carbon accounting. The Brazil Mata Viva and CARBCO Platinum Standards were excluded due to the lack of any project documents and guidelines, thus making review impossible. Table 3.2 shows the 11 standards selected for review.

Table 3.2. Voluntary Carbon Standards Selected for Review

Fully Fledged Carbon Standards	Project Design Standards	Other Standard Types
Gold Standard (GS)	CCBS	Plan Vivo
Verified Carbon Standard (VCS)	SocialCarbon (SC)	
VER+		
Climate Action Reserve (CAR)		
American Carbon Registry (ACR)		
CarbonFix (CF)		
Chicago Climate Exchange (CCX)		
Panda Standard (PS)		

The latest version of each identified standards LULUCF / AFOLU guidelines were collected, where possible, and analysed. This was done for two reasons, firstly as the initial development of the proposed South African voluntary standard will focus on landscape restoration projects and it is vital to incorporate these best practices into the design process. Secondly, landscape restoration projects are the most complex and stringent projects for certification and incorporate all the elements that are needed to ensure that the credits are real, reliable and permanent, thus many of the components and techniques developed for a LULUCF projects are applicable to other project types. If a standard did not accept LULUCF

projects or have guidelines, such as the GS, it was evaluated on its merits according to what was detailed in the actual project guideline documents.

3.2.3. Developing a Score and Ranking the Standards

To evaluate each standard only the essential criteria (Table 3.1) were chosen. This was done as they provide the appropriate detail vital for a carbon standard and allowed them to be quantified. The quantification of the essential criteria allowed for the development of a score for each essential criterion and this in turn facilitated the effective comparison between the individual criterion of each standard and the standards as a whole. The defining elements of each criterion were identified from Walter and Kahlert (2010) and Kollmuss et al. (2008) and used to guide the development of criterion specific questions and indicators (Table 3.4). A scale between 0 – 2 was developed for each question/indicator. A score of 0 showed that that particular element was not included in the standard, a score of 1 highlighted that the criteria was partly included, while a score of 2 showed it was completely incorporated into the standard according to the criteria. The scores were added up for each criterion so as to calculate the overall score for that specific criterion. A total overall score for each standard was achieved by adding up the scores for each criterion. The maximum possible score for each standard was 66. To make the evaluation more accessible and understandable; each criterion was converted to a value out of 5, thus allowing for each standard to obtain a score out of 50. No weighting was applied to the criteria for two reasons, firstly, not every standard incorporated each criterion and thus a weighting would have distorted the overall scores. Secondly, for consistent evaluation each criterion was assigned the same weight as it allowed for comparison between standards.

3.2.4. Best Practice Identification

The voluntary carbon market abides by the Sharif (2002) statement and is further reiterated by Galatowitsch (2009), that within the voluntary carbon market, as yet, there is no single dominant ‘best in class’ practice. Simply calculating the average score does not provide the requirements to identify an industry ‘best’ practice (Laise, 2004). This process does not allow for the verification of a ‘dominance’ relation of certain characteristics, as organisations will generally show better performance on some indicators and weaker performance on other. This is reiterated by Sharif (2002) which outlines that there is no single system which is best in class across all areas. This lack of a ‘dominance’ relation is traditionally overcome by

calculating the average scores and creating a synthetic indicator (Drew, 1997; Sharif, 2002). In turn the best practice is identified according to the organisation with the maximum averaged value (Laise, 2004). This averaging of scores has been highlighted as a main disadvantage to the traditional approach of identifying best practices.

In this study the total scores were calculated to obtain an overall average score that allowed for a face value, initial comparison between standards; but these did not dictate the identification of 'best practices'. To overcome this, a comparison between the individual criteria of each standard was conducted. If a standard obtained a high score in any one criterion, but lower in others, the key characteristics of that criterion were investigated. These were then documented and used to assess the positives and negatives of each of the standards evaluated. This is particularly relevant in relation to the GS evaluation. Due to the GS only certifying renewable energy projects it does not focus on, or include, some of the key criterion that are required for landscape restoration projects. This caused it to score lower on the overall average scores. This however is not an accurate reflection of its contents, thus an evaluation of its individual criteria, as described above, was conducted to obtain an accurate reflection of its contribution to identifying best practices. This allowed for both a quantitative and qualitative approach to determining the current market best practices and was an attempt to avoid the pitfalls highlighted by Laise (2004) through using the average score approach to dictate best practice identification.

3.3. Voluntary Carbon Standard Criteria - Discussion

3.3.1. Essential Criteria

3.3.1a. Baseline (BAU)

Calculating a baseline for a project is a vital component in calculating a projects GHG offsetting potential (Kollmuss et al., 2008). A baseline attempts to represent the proposed BAU scenario of the activity if the offset project was not implemented. This allows for the number of credits generated from the project to be determined. The difference between the BAU scenario and the emissions reductions resulting from the project equals the amount of carbon credits generated for the project (Kollmuss et al., 2008). Some standards prescribe a top-down approach to determine the baseline while others use a pure bottom-up approach. Bottom-up baselines methodologies require that the project developers propose, and gain approval, for project appropriate methodologies.

Baselines can be established using project-based or performance-based approaches. The approach used to determine the BAU scenario must be based on verifiable information and be explicit enough to allow for a conservative estimation of the corresponding GHG emissions reductions, so as not to overestimate the achieved emissions reductions. All the standards have differing approaches to calculating the BAU scenario. They differ in terms of the frequency of baseline determination; that is baselines can either be static or dynamic. A static baseline does not change and is calculated at the start of the project, while the dynamic baseline is updated periodically based on project observations and the emissions reductions are calculated accordingly (Kollmuss et al., 2008).

Gustavsson et al. (2000) outlines four basic principles of baseline construction. They state that all baselines should aim to be accurate, comprehensive, conservative and practical. There have been many criticisms of both approaches to setting baselines. Project-specific baselines have been criticised for their lack of consistency and their choice of subjective baseline calculation parameters (Murray and Sommer, 2004), when replicated over projects in a stratified area within a given region (Sathaye and Andrasko, 2007). The high transaction costs due to each project having to be evaluated individually have also been highlighted as a barrier to the use of project specific methodologies. Performance-based standards have been criticised for their generalisation and simplification of the local context. In most cases averages and extrapolations are made to obtain regional specific characteristics and as such the baselines. This process has called in to question the environmental integrity of developing regionally specific baseline criteria (Kollmuss et al., 2008). However regional specific baselines have been lauded for their cost effectiveness and reduction of the selection of contentious baseline criteria based and asymmetric information. Sudha et al. (2007) found that developing a performance specific baseline for the Kolar District, India cost a quarter of developing project specific baselines for each project.

Moura Costa et al. (2000) highlighted that baselines are inherently based on assumptions and to be as accurate as possible a detailed overview of local conditions has to be incorporated into this baseline determination process. Understanding the historical practices of the project area, the socio-economic situation and economic trends allow for the estimation of a more accurate and comprehensive baseline estimation. Moura Costa et al. (2000) recommend that, in the case of a lack of regulation concerning baseline estimation, the most conservative, accurate and comprehensive approach is developed through project specific baselines.

Murray and Sommer (2004) conclude that both approaches to baseline setting are valid, however it depends on the project's perspective to selecting the appropriate baseline approach. Currently there is not enough reliable data to model highly accurate and comprehensive performance based methodologies for all potential project sites, therefore detailed project based approaches are currently the only viable baseline setting methodology for project developers (Murray and Sommer, 2004). A performance-based approach is more attractive from a regulatory and public policy perspective, however the responsibility and costs of developing these lies with the appropriate regional regulatory authority. A formalised approach to establishing baseline methodologies is needed and with the lack of appropriate market oversight and regulation, the project-based methodology will continue to be widely used and trusted.

In evaluating each standard baselines determination approach, the principles outlined by Gustavsson et al. (2000) will be used. This will allow for an unbiased evaluation of each standard regardless if they prescribe a project-specific or performance-based baseline approach.

3.3.1b. Additionality

Additionality requirements aim to ensure that the emissions sequestered or reduced within a project boundary are additional to what would have occurred anyway (Murray et al., 2007). Vital to proving additionality is proving that the projects main aim is to reduce emissions that would not have occurred under the BAU scenario (Houdashelt et al., 2006). As mentioned in Chapter 2, proving additionality is an essential component to any baseline-credit scheme. This issue has become one of the most fundamental, and contentious, issues in the carbon market as it is incredibly difficult to determine in practice. There have been many approaches to determining additionality to a) increase the accuracy of additionality calculations, and b) reduce the administrative cost for project developers. Additionality tests have taken two distinct paths, one being individual project based tests and the other performance-based standards.

Project-Based Tests

Project-based additionality tests evaluate each project on a case-by-case basis (Kollmuss et al., 2008). There are currently four common tests for additionality that aim to provide a

comprehensive overview, they are: Legal and Regulatory Test, Investment Test, Barriers Test, Common Practice Test (Kollmuss et al., 2008).

- Legal and Regulatory Test

If a project is undertaken to comply with official policies, government regulations or industry standards the project cannot be considered additional. The project can only be considered additional if it goes above and beyond mere compliance.

- Investment Test

The investment test aims to prove that the financial reward from generating offset credits is a decisive reason for implementing a project. This test assumes that a project is additional if it would have a lower than acceptable rate of return on the investment without the revenue from the sale of offset credits.

- Barriers Test

This test looks at identifying potentially significant non-financial barriers to implementation of the project such as local resistance, lack of experience or capacity or lack of technology etc that the BAU scenario would not have to face. It has to be proved that these barriers will be overcome by the project in order to be considered additional.

- Common Practice Test

The project must not use technology or practices that are commonly used. The argument is that the use of common technology might not be additional as carbon offsets did not play a decisive role in making the project financially viable.

Performance Standards

Performance standards aim to address some of the weaknesses of project based additionality tests. They establish a threshold for technologies or processes and the project is compared to these (Kollmuss et al., 2008). If the project exceeds the threshold then it is considered automatically additional. This allows for a simpler procedure to be followed and lower transaction costs for the project developer. There are two common performance standard approaches: the benchmark approach and the positive technology lists.

- Benchmark Approach.

This test establishes a generic baseline scenario against which all projects of a given type are compared. Using this technique for additionality measurements presumes that technologies with emissions lower than a given emissions rate would not be deployed without the incentive from carbon offsets. In the case of an A/R or landscape restoration project, this would be the baseline scenario across a geographic region in terms of both land degradation and bio-sequestration potential. This would then be extrapolated to all the projects within the specific defined area for which the baseline has been developed.

- Positive Technology Lists

These lists define which technologies are automatically considered additional if installed in a certain geographic region. A baseline methodology is still required to determine the number of offset credits generated from the project. This allows for rapid additionality accreditation. This methodology is not applicable for an A/R project.

3.3.1c. Leakage

Leakage is the unintended GHGs emissions increase outside or, the displacement of activities by the project that increase or decrease emissions, outside of the projects boundaries (Kollmuss et al., 2008). Defining the offset project boundaries is a crucial process in the determination of leakage; these include physical, legal and organisational boundaries (Murray et al., 2004). Determining leakage is a vital process in accurately quantifying the projects emission reductions, all emissions decreases and increases that result from the project need to be taken into account. In many cases it is incredibly difficult to account for every possible source of leakage and GHG emissions caused by each project. Under some standards leakage is explicitly accounted for, while under some standards they exclude certain types of leakage.

3.3.1d. Permanence

The issue of permanence is highly contentious and applies uniquely to LULUCF and landscape restoration projects (Marechal and Hecq, 2006). Permanence refers to the length of time that carbon will be stored within the landscape after being sequestered (Kollmuss et al., 2008). The issues revolve around the ease of reversibility of land based projects, either through anthropogenic or natural causes, which could cause the re-emission of the stored carbon into the atmosphere. Risks to the long term permanence of LULUCF based projects

can be varied and range from land tenure and financial issues to fires, pests and storms (Merger and Williams, 2008). LULUCF projects that are sustainably managed and have clear land tenure relationships can reduce the risks associated with permanence and allow for the projects to be considered long-term sinks. Some standards require the extensive risk analysis processes to be conducted during the project design phase and all risks to be mitigated. Others aim to ensure the permanence of the projects against natural risks by placing a proportion of the credits in a buffer fund that can be used to replace credit shortfalls (Thomas et al., 2010).

3.3.1e. Co-benefits

Co-benefits relate to the added sustainable development benefits that an offset project offers. Sustainable development criteria within offsets standards ensure that projects have social and environmental benefits (Merger and Williams, 2008). Well-managed and sustainable projects are closely associated with these co-benefits and they can offer increased employment, biodiversity and watershed conservation and the provision of recreational services. Landscape restoration projects have the potential to be one of the project types with a comparatively high provision of sustainable development benefits, and as such they should be aimed to be ensured in all LULUCF projects.

The appearance of sustainability criteria within offset standards has allowed for the distinction between ‘gourmet offset standards’ and ‘minimum offset standards’ (see Chapter 2, Section 2.8). The difference between the two standards is useful as the incorporation of sustainable development goals are no longer seen as vital requirement of a carbon offset (Kollmuss et al., 2008). Projects often choose to pursue certification under a ‘minimum offset standard’ in spite of projects that are certified to a ‘gourmet’ standard often receiving a higher price per offset in the voluntary market (Galatowitsch, 2009).

3.3.1f. Transparency

There are two major components of transparency in carbon offsets standards; these are the ability to communicate where the carbon has been stored and the prevention of double selling (Merger and Williams, 2008). Communication is the key to facilitating transparent projects, interactions and information transfer. As project investors make their decisions on a variety of project parameters it is vital that an easy to understand and comprehensive outline of the

project is publicly available and accessible. This will allow for project to become attractive to investors as they can judge a project for themselves.

The second aspect to transparency is the prevention of double selling. This relates to the need to avoid one offset credit being sold to two or more parties, thus effectively negating the offsetting effect. This would be possible when one project is certified by two different standards or offsets are not accounted for (Merger and Williams, 2008). This has been counteracted by the creation of carbon registries and the allocation of unique serial numbers to all credits produced by projects.

3.3.1g. Registry

Registries are vital in minimising the risk of double counting of offsets and allow for the clarification of the ownerships of assets as they track and store all the records of issuance, selling and retirement. There is no single registry for the voluntary market and they have been developed by governments, non-profit organisations (NPOs) and the private sector (Kollmuss et al., 2008). However they all function similarly in that they provide publicly available information. Broekhoff (2007) states that the main role of a registry is to:

- uniquely identify projects,
- serial numbers for each offset generated by each project,
- a system to track ownership of offsets,
- able to retire or check on the status of an offset,
- legal standards that identify the original owner of the emissions reduction project,
- contractual or legal standards that identify the liability of the risk in case of project failure.

Registries allow for the simplification of the carbon offset delivery process. This allows the buyers to be assured of both quality of the offset and their ownership of the offset. Registries also allow for the retirement of offsets if they are used to directly offset the purchaser's emissions.

3.3.1h. Public Participation

Public participation allows for stakeholders that are affected in some way to be consulted. Stakeholders are individuals, groups or organisations that are affected by the project (Kollmuss et al., 2008). Stakeholder consultation also aims to ensure transparency of the

project through making information public and available for comments. These are important tools that can be used to obtain information that will mitigate the possible negative impacts of the offset projects. Offset standards require different levels of stakeholder participation and differ in terms of the scope of stakeholder consultation. This is particularly relevant in relation to the incorporation of co-benefits within LULUCF projects, as they are key component of precautionary decisions making. It is a vital step to ensure the transparency and credibility of a project.

3.3.1i. Third Party Auditing

An independent third party auditor is required to ensure rigorous monitoring, verification and validation of projects and their stated carbon offsets. The third party auditor is responsible for oversight throughout various phases of the project. The validation process is initiated during the project design phase; it confirms the sound planning of a project developer and the compliance with the chosen offset standards rules and regulations. The verification phase is ex-post and is a confirmation that the project is performing to its projected outcomes, the amount of emissions reductions are also confirmed in this phase.

3.3.1j. Verification Frequency

This involves the frequency of field visits undertaken to verify that the project is adhering to the standard. The process differs between standards but its aim is to ensure the integrity of standards and projects. Typical A/R projects have a lag time between project start and the generation of credits with standards varying the first initial verification from 2 – 5 years after the project start date.

3.3.2. Variable Criteria

3.3.2a. Type of Credits

One of the most important contract parameters is the actual mechanism used to deliver the offsets to the project investor. These can take a variety of different forms and each form entails its own set of risks (Kollmuss et al., 2008). Offsets can be purchased in three different ways; these are: 1) guaranteed emissions reductions, 2) guaranteed future emission reductions or 3) intended emissions reductions. These are classified into two categories, guaranteed emissions offsets and *ex-ante* offsets.

- Guaranteed emissions offsets

Guaranteed emission reductions have either already occurred (*ex-post*) or will occur in the future. *Ex-post* offsets are the sales of offsets that have already been generated (Galatowitsch, 2009). The project developer assumes all the costs of the project; these include project implementation, operational expenses and the costs for certification. The project developer also assumes all the risks during this phase. However after successful project implementation having the carbon offsets in stock allows for the risk-free delivery of offsets to purchasers. This allows for higher prices to be generated as the project related risk for purchasers is non-existent. The exact amount of carbon offsets can also be promptly delivered and guaranteed by the project developer.

Forward delivery, or offsets that will occur in the future, is an agreement between offset providers and investors that emissions reductions certificates will be provided at a pre-determined time and price. This is a way to eliminate market risks such as volatile prices even though delivery may occur later. Forward contracts may specify a fixed or proportional amount of offsets to be delivered. The major risk involved in this type of transaction is that of credit risk. This relates to the risk of the offsets provider being unable to meet its contractual agreement and thus the buyer has to pay the current market price for offsets.

- *Ex-ante* offsets

An Ex-ante offset is the forward crediting of emissions offsets. This is the most complicated type of transaction and hence carries the highest transaction risk. This works in the case that the buyer pays the purchase price for a certain number of offsets that have yet to be produced. These offsets do not exist and therefore the risk is inherent in that the successful generation of the offsets is uncertain (Kollmuss et al., 2008). In some instances purchasers pay upfront with no guarantee of fulfilment of offset delivery, therefore the purchaser carries the risk that the price paid may be lost as some offsets may not be delivered. In some contracts the developer carries the risk, though they are required to compensate the purchaser in the event of a failure to deliver the required credits.

3.3.2b. Project Location

Different standards only accept projects from different locations around the world, e.g. Panda Standard in China. Understanding where projects are situated and the criteria needed to obtain certification will allow for a greater understanding of the certification process.

3.3.2c. Project Types (Eligibility)

Carbon offset projects vary widely and can be grouped into differing types of projects. All the projects vary in their scope and effectiveness. They can be roughly categorised into five categories: bio-sequestration, industrial gases, methane, energy-efficiency and renewable energy (Kollmuss et al., 2008). Standards differ in the projects they will certify, some cover all project types, while others only focus on renewable energy or exclude bio-sequestration projects.

3.3.2d. Cost of Certification

As high certification costs can be a significant barrier to entry for some offset project developers. It is vital to understand the costs involved in the process and where the majority of costs arise.

3.3.2e. Price of Offsets

Identifying the average price gained for each offset under each standard will allow for an understanding of what the market is willing to pay per offset. Direct market-related comparisons can then be made and the underlying reasons for the differing prices can be interrogated and understood.

3.4. Results

The results from the scoring process are presented in Table 3.3, a score of 5.0 shows that the standard effectively incorporates and deals with the criterion, while a score of 0 highlights that the criterion is not considered or dealt with at all. Table 3.4 highlights the main summary points of each standard evaluated. These summary points were obtained from the full detailed review of each individual standard.

This table allows for a rapid comparison between criteria of the differing standards as well the comparison of the overall scores. It has to be noted that differing organisations have differing objectives and goals in the certification process, i.e. the difference between fully

fledged standards and project design standards. Therefore it is not necessarily accurate to compare overall scores to determine the 'best in class' standard. In this evaluation, the emphasis is placed on the comparison of the individual criterion between standards. This is done to identify common themes within the market well as prevailing practices amongst standards and how they are applied.

Table 3.3. Analysed Voluntary Carbon Standards

	VCS	GS	VER+	CAR	ACR	CarbonFix	CCX	CCBS	SC	Plan Vivo	PS
Baseline (BAU)	5.0	5.0	5.0	4.0	5.0	3.0	3.5	2.5	1.5	3.5	3.0
Additionality	5.0	5.0	5.0	4.4	4.0	4.4	1.3	5.0	0.6	1.9	3.8
Leakage	4.2	1.7	0.0	5.0	4.2	5.0	0.8	5.0	0.0	2.5	5.0
Permanence	5.0	0.0	3.8	3.1	5.0	5.0	2.5	2.5	0.0	5.0	3.1
Co – Benefits	1.0	5.0	1.0	0.5	3.0	5.0	0.0	5.0	5.0	5.0	3.5
Transparency	2.5	3.8	5.0	5.0	5.0	5.0	2.5	2.5	3.8	5.0	1.3
Registry	5.0	4.2	5.0	5.0	5.0	5.0	4.2	0.0	5.0	5.0	5.0
Public Participation	2.5	5.0	2.5	0.0	0.0	5.0	0.0	5.0	5.0	5.0	0.0
Third Party Auditing	5.0	2.5	5.0	2.5	5.0	4.0	2.5	5.0	5.0	3.8	5.0
Field Verification Frequency	3.8	5.0	3.8	5.0	3.8	5.0	3.8	2.5	3.8	2.5	5.0
Total Score(50)	39	37.2	36.1	34.5	40	46.4	21.1	35.0	29.7	39.2	34.7

3.5. Discussion

The 11 carbon standards analysed cover the entire scope of the voluntary carbon market, from the most popular, wide-ranging standards to brand new standards that are country-specific. There have been a number of different paths followed, with the development of differing standard-specific tools for baseline determination, additionality and risk assessment to name a few. The voluntary market has become the ideal platform to encourage innovation (Peskett et al., 2007) and this is evident in the number of standards and their unique processes. Some standards have been more accepted than others in the market, making them the clearly dominant standards. It has been argued that the voluntary carbon market will improve with the reduction in the number of standards, as it will reduce complexity for project developers and allow for a uniform comparison of projects between standards for potential investors (Marais et al., 2007). However the relatively low presence of the voluntary market in global carbon markets has highlighted that there are pitfalls and barriers to entry into the market for project developers, purchasers and investors. This has often centred around the process involved in obtaining voluntary certification, and issues such as high transaction costs (Marais et al., 2007; Galatowitsch, 2009), complex methodologies and carbon accounting uncertainty (Peskett et al., 2007) and the often bureaucratic and complex processes dictated by standards to achieve certification (Marais et al., 2007, Neef et al., 2010).

The significant barriers to entry and therefore limited acceptance of carbon standards, both mandatory and voluntary in developing countries, sends a clear signal for the development of new standards, or the refinement of the processes that will address these issues and encourage the development of the global voluntary carbon market. These issues vary in different magnitudes across standards and there is not a single standard that currently addresses all of these issues. The most common issues are high transaction costs which severely limit and prevent projects in developing countries from obtaining certification and complex bureaucratic processes. The need for the use of third party independent certifiers and validators, often from developed countries, adds high amounts of costs to projects that often have limited start-up funding. While all of the processes contained within voluntary carbon standards have been developed to ensure the validity, permanence and legitimacy of carbon projects, and while some are highly successful at achieving this, they are often highly complex and inefficient.

The current standards in the voluntary market exhibit a wide-ranging swathe of differing characteristics and tools, all focussed at achieving slightly different facets and goals related to the voluntary market, from pure carbon certification to ensuring the generation of co-benefits from projects, as well as a mix of the two. Currently the most popular standards, in terms of market share, focus on carbon offsetting and co-benefits, the VCS, CCBS and CAR have dominated with a combined market share of 69% in 2010 (Peters-Stanley et al., 2011). However, offset standards focusing on both carbon and co-benefits achieved the highest prices in the market with the GS (\$11. 1/t CO₂), CarbonFix (\$10. 9/t CO₂) and Plan Vivo (\$8.9/t CO₂), but with a relatively minor market share of 12.8% (Hamilton et al., 2010). Both project developers and purchasers need clear information on what needs to be done, how it should be done and the guarantee that their project will return legitimate carbon offsets that can be sold and retired; without these clear guidelines the voluntary market will continue to falter due to uncertainty off outcomes from all participants.

The optimum way to achieve this is to ensure that the carbon certification process is clear, relatively simple to follow and efficient, thereby reducing transaction costs, both financially and in terms of opportunity costs. To overcome this there is an increasing trend of designing an “embedded standard” that is applied almost exclusively to projects within one geographic region (Peters-Stanley et al., 2011). Key examples that have emerged from these are the BMV and China’s PS. While they all focus on differing areas, with different processes, they follow the same idea and are tailored to their unique domestic situations to meet local demand with a local, certified supply of offsets. This is a relatively new phenomenon and in 2010, the first year for BMV, captured 5% of the global trade in VERs, and they were almost exclusively purchased by Brazilian investors (Peters-Stanley et al., 2011). The BMV is currently the only embedded standard with certified projects that are being traded. These embedded standards have been predominantly situated within large developing economies and have served as an example of the potential effectiveness they can play in stimulating the local carbon markets through a locally tailored certification process.

This analysis of the 11 voluntary carbon standards found that CarbonFix returned the highest overall score of 46.4, followed by the ACR (40) Plan Vivo (39.2) and VCS (39). The average score among all the standards was 35.8. A number of the standards score highly but there is not one that encompasses all the essential components of a voluntary carbon standard. It has to be noted that this is often via strategic choice of the standards such as ‘Project Design’

standards, which cause these components to be less emphasised and in this specific evaluation it would lead them to score lower in the overall evaluation. The evaluation does however allow for a comparison of specific criteria, such as additionality, amongst all standards and this is useful for the identification of market best practise. To understand this in more detail it is necessary to discuss how and why and how each standard achieved its ranking (Table 3.3).

3.5.1. VCS

The most popular voluntary carbon standard, the VCS, with a 35% market share in 2009 (Hamilton et al., 2010), scored 39. The VCS has been widely accepted in the market due to it being one of the first voluntary standards, a wide ranging acceptance of all projects and its association with respected institutions such as the International Emissions Trading Association (IETA) and the World Economic Forum (WEF), which adds legitimacy. The VCS also followed a lengthy two year development process that incorporated a large public consultation process and this has led to the VCS being highly respected and adopted by both project developers and investors.

The VCS is a quality standard that ensures that carbon aspects of a project that is certified are real, reliable, additional and permanent; however it does incorporate a highly complicated and inefficient process to obtaining certification. The VCS calls for a lengthy double review process for all new project methodologies which stymies development of new methodologies, as it leads to increased costs for project developers, especially in terms of opportunity costs. A lack of a detailed and mandatory public participation process that allows for comments during the validation phase also hampers the score for the VCS. This coupled with a lack of the critical recognition of sustainable development, especially biodiversity and water trade-offs. This keeps the price of VCS credits low and might lead to questions surrounding the overall integrity and equity of VCS certified projects. The VCS also needs to address the frequency of field verification to ensure that a project is abiding by VCS guidelines once certified and that offsets are still reliable after a few years.

3.5.2. Gold Standard

The GS scored 37.2. It has become a widely recognised standard with the backing of the WWF and has been accepted for its stringent and comprehensive requirements. The GS is a high quality standard that emphasises the generation of co-benefits and ensures both the

carbon and sustainable development benefits of the projects that obtain certification. It ensures that projects generate credits that are real, reliable, and permanent and it scores highly in baseline requirements, additionality, co-benefits and public participation. It has to be commended in that it is the only standard that mandates the continual monitoring of co-benefits in conjunction with carbon offsets, thus ensuring the continued emphasis on the generation of co-benefits. The GS has established itself as the largest voluntary standard that incorporates co-benefits and it does this in a unique and comprehensive way.

The GS does however have its pitfalls. It is focused exclusively on renewable energy and energy efficiency projects and this has led it to fall behind in the global market. The GS does have demanding requirements and strict guidelines which adds complexity and cost to the process and might discourage some project developers from subscribing to their guidelines. It does not include any guidelines or requirements on the permanence of projects or the potential leakage associated with projects, but this is associated with the project types they accept and thus they score lower in this criterion. The GS also loses out on independent third party auditing requirements which they leave to the DOEs, this could lead to discrepancies surrounding DOEs interpretations and lengthy processes needed to obtain validation and verification from differing DOEs.

3.5.3. *VER+*

The *VER+* has been a relatively small player in the voluntary market but scores well in most of the essential criteria. The *VER+* scored 36.1. It was developed by the TUV SUD, a well-respected DOE which has a very good reputation (Kollmuss et al., 2008). The *VER+* is a base level quality standard that achieves its goals well, but it does not place any emphasis on the generation of co-benefits and as such has been usurped by the VCS and GS. The *VER+* does set out a straightforward approach to obtaining certification and accepts a wide range of projects of different sizes. The standard places a lot of emphasis on the baseline, additionality, transparency and registry elements.

The *VER+* however does not include any leakage considerations and has weak permanence criteria for projects. Public participation is also weak with a local process only needed if required by the host countries laws. The *VER+* does not offer anything new or different to the larger and more established voluntary carbon standards and with questions surrounding its

third party auditing legitimacy (Kollmuss et al., 2008) it will continue to be overshadowed by its larger competitors.

3.5.4. CAR

The CAR has become the largest voluntary carbon standard within the USA and one of the largest in the world, with 31% of the market share in 2009 (Peters-Stanley., 2010). It is the most advanced and progressive standard in the USA, but is solely applicable to the USA market. The CAR scores 34.5. It scores lower as it uses a standardised baseline approach where all baseline methodologies are developed by the CAR. This adds uncertainty to the legitimacy of the carbon offsets as not all projects are the same. Additionality assessment is also standardised according to project types and this is a novel and unique approach, it allows for the removal of confusion surrounding additionality. This additionality methodology however might allow for the approval of projects that are not truly additional due to their not being a 'back check' process. Permanence is well dealt with and comprehensive, however it does not call for the mitigation of identified risks, rather just the insurance against the probability of the risks occurring.

While there is still room for improvement on the additionality, baseline processes and permanence, the CAR falls short on its incorporation of co-benefits and public participation requirements for projects. A lack of validation of projects also needs to be assessed to make the process more transparent and it would ensure projects are additional and legitimate. In general though, the CAR ensures that purely carbon offsets are accounted for and offers some novel approaches to making this process quick and efficient. Improvement of some areas, namely allowing for both project specific methodologies and a standardised approach, instituting a validation process and incorporating co-benefits will make this standard more attractive to a wider sector of the market.

3.5.5. ACR

The ACR scores highly in the majority of essential criteria for a voluntary standard, with a total score of 40.0. The ACR has been developed privately, particularly for the American market, and builds heavily on the work of the CDM and other standards for its essential elements. It is for this reason that the ACR scores well in all its elements. The ACR allows for the utilisation of approved baseline methodologies from other standards such as the CDM and the VCS as well as providing a comprehensive approach to the third party verification

process. It does emphasise the potential co-benefits from projects more than the standards it has modelled itself after, however this is still not the most effective or efficient approach to incorporating co-benefits into the process. The ACR does provide an assurance that the credits certified under the ACR are real, reliable and permanent however it does not distinguish itself from other standards and thus it has obtained a small market share of 4% in 2009 (Peters-Stanley et al., 2010).

3.5.6. CarbonFix

CarbonFix is highly recommended for all LULUCF carbon projects, and scores the highest with 46.4. It manages to turn a once thought of highly complex process into a user friendly, straightforward efficient method that uses unique methods and tools to ensure that carbon offset projects are real, reliable and permanent while ensuring co-benefits. It offers templates that each project has to follow; these provide a detailed and useful guide that allows projects to quickly and accurately apply for certification. It offers a unique credit tracking process that allows purchasers to track their credits via Google Earth. All this has led CarbonFix to achieve relatively high prices but it still remains with a low market share, just 0.6% in 2009 (Peters-Stanley et al., 2010). The main reason for this is it only certifies LULUCF projects, which limits its wide spread use and acceptance.

CarbonFix uses a standardised baseline which negates the need for a review process for new methodologies. This does speed up the time of approval but it also might allow for projects to either under or over calculate the exact baseline for differing projects, this contributes to its lower baseline score.

CarbonFix scores highly in all areas including additionality, permanence, co-benefits, transparency, public participation and verification frequency. Third party auditing does not score the maximum due to CarbonFix doing internal validation of projects, but it has to be noted that this is a novel approach to undertaking validation. CarbonFix is a highly commendable standard for LULUCF projects.

3.5.7. CCX

The CCX was a major player in the voluntary carbon markets and was the platform for the most voluntary market transactions worldwide (Hamilton et al., 2010). The CCX scores the lowest of all the standards reviewed with 21.1. This is as a result of large number of questions around the CCX's additionality testing procedure which fell short and lacked a test of

financial additionality. This is a result of it aiming to institute a sectoral, performance-based test of additionality. Leakage is also a major issue within the CCX as it does not expect a forest project to result in leakage, thus it does not need to be included. Permanence of LULUCF projects was an area that needed to be addressed within the CCX. It did not have any legal guarantee that offsets would not be released back into the atmosphere after the 15 year commitment period. This coupled with a lack of public participation, any recognition of co-benefits and weak third party auditing requirements made it a highly inefficient and unacceptable standard.

While it was easy to achieve the weak certification requirements it did lead to an oversupply of credits to the CCX and a drop in demand. This is evident in that, even though it is a large market in terms of volume it continued to receive the lowest prices for its voluntary credits. This led to the closure of the CCX and the proof that stringent additionality, permanence, leakage and third party certification criteria are needed to ensure the integrity of carbon offsets for both suppliers and purchasers and thus encourage higher prices for offsets.

3.5.8. CCBS

The CCBS has established itself as leading project design standard that focuses exclusively on quantifying the co-benefits associated with LULUCF projects. It has become the most popular co-benefits certification tool and when coupled with other standards, such as the VCS or CarbonFix, it ensures the environmental and social integrity of projects. Accordingly the CCBS score highly on the criteria such as additionality, leakage, co-benefits, public participation and third party auditing. But as it is designed as a project design standard it does not score highly in some of the criteria specifically associated with full-fledged carbon standards. This causes it to score lower with a 35.0.

The CCBS runs the risk of becoming obsolete as standards evolve and new standards emerge that incorporate more stringent co-benefit criteria in one package that ensures a project offers a ‘gourmet’ carbon standard without having to obtain dual certification. At the present moment, combining the CCBS with a fully-fledged carbon standard ensures that projects are real, reliable and permanent while ensuring the highest level of environmental and social integrity.

3.5.9. SocialCarbon

SC is another project design standard that offers a methodology to ensure that the sustainable development co-benefits of carbon offset projects are obtained. It relies heavily on the requirements of the other standards it is partnered with, as these need to ensure that additionality, baseline, leakage and permanence of a project. The SC methodology emphasises public participation in determining and measuring co-benefit indicators, and thus it scores highly these areas. It scores 29.7 across all criteria, but in its focus areas it scores highly.

SC is the only project design standard that is applicable to a wide variety of projects, and for this it has to be commended. However it runs the same risk as that of the CCBS. To remain relevant and competitive it needs to alter and improve the other essential criteria and standardise its processes associated with these. The use of SC on its own is not currently enough to ensure the integrity of carbon offsets.

3.5.10. Plan Vivo

Plan Vivo scores highly with a 39.2. This is a result of its novel approach to project design that emphasises participatory development of small-scale, community-based LULUCF projects. This enables Plan Vivo to score highly in the areas of permanence, co-benefits, transparency and public participation. It does however fall short around the key issues of baseline methodologies, leakage and additionality. In terms of additionality it utilises a barrier approach to determining additionality, this could lead to projects that are not truly additional being granted approval. Leakage also does not score top marks as it relies on the producers accurately reporting on activities, this could lead to some misrepresentation on the true leakage figures.

Plan Vivo projects attempt to make a difference in the communities they aim to be involved in and, as such, the demand for Plan Vivo credits is high. However Plan Vivo projects are highly academic and this could be a barrier for project developers to utilise this standard. At the same time, the carbon accounting criteria are weaker than other standards. The grass roots approach of the Plan Vivo is admirable, yet it cannot truly guarantee that the actual emissions reductions will be realised out of a project. While Plan Vivo offers a fresh, unique and revolutionary approach to incorporating small, scale community based carbon offsets it will not be able to compete with the larger, standardised and recognised voluntary offset standards

unless the focus of the market turns toward purchasing offsets from projects that focus more on sustainable development than purely carbon offsetting.

3.5.11. Panda Standard

Launched in 2010 the PS is new and as such little information is available regarding the standard. It is one of the first voluntary embedded standards developed specifically for an individual country, in this case the People's Republic of China. It scores (34.7) lower than other standards due to there being very little information to evaluate. It does look to include some exciting new developments for the voluntary market. It aims to address development challenges that are identified as China's main problems, for example a key benefit to be emphasised from carbon projects is poverty alleviation. It remains to be seen what the final detailed document of the PS lists, but this is a very encouraging sign in the development of a new, country specific standard for the voluntary carbon market.

3.6. Conclusion

There have been a number of overall trends identified within voluntary carbon standards. Each standard follows a similar format but addresses the detail in different ways. It is vital to understand the processes that have made the market favour the VCS and made it the most widely accepted standard, while for example CarbonFix has not been as widely accepted. These mainly relate to the preference to specific project-based baseline methodologies that need to be approved by the relevant standards methodology board. Once approved these then become publicly available for use by other potential projects developers. The use of a three-pronged project-specific additionality test has also emerged as the preferred process for assessing additionality as it offers a comprehensive and efficient way to ensure that projects are additional. Performance based additionality testing has also been incorporated into some standards but it has not received much attention to date. Sectoral-specific additionality tests have also become prominent in a number of standards, such as CarbonFix, and this is encouraging as it will in future streamline the additionality determination process.

Risk assessment tools that aim to ensure the permanence of projects has been a continued theme running through the majority of standards, but the way they have been implemented have been diverse and unique. The use of a buffer pool for LULUCF projects has been prominent and has become to be seen as a reliable and efficient way of reducing the risk associated with LULUCF projects, however the size and risk assessment methods to

determine this differs throughout. The VCS has been identified as a leader with its risk assessment methodologies and many of the standards incorporate the VCS or CDM methodology for risk assessment.

Another key area where standards differ greatly is the methodology to ensure the generation of SD co-benefits. Not a single standard institutes a similar approach; they differ from sustainable development matrixes to guidance criteria and the development of specific indicators that need to be reported on. The CCBS methodology has been lauded for its co-benefit methodology that ensures sustainable development within the LULUCF projects, but credit also has to go to SocialCarbon, Plan Vivo, GS and CarbonFix for their unique, innovative and comprehensive SD co-benefits methodologies.

Public participation in carbon projects is emerging as a major, essential theme and some standards have begun to incorporate this into their guidelines. The GS and CarbonFix are currently the only fully fledged standards that mandate a thorough public participation process. Coupled with this is the need for transparency in the availability of project documents and decision the making process. In this CarbonFix is a leader with innovative techniques that allow for all interested parties to access information throughout all phases of the project. The need to ensure third party auditing of projects has been a key requirement of all standards, this is to ensure the independence verification of the validity of the project. Key to this is field verification visits. It is within this that standards have differed and the GS and CAR are leaders in that projects are verified every 3 - 5 years, thus ensuring that offsets are real and reliable and that a standards maintains its effectiveness over the lifetime of a project.

It has to be recognised that this analysis is not as straight forward as suggested by the evaluation matrix. It has to recognised that acceptance by the market is not merely a case of the differing processes and details of each standard but rather a broader political, social and economic process that has evolved along with the standards and general global climate change developments. It is clear that certain standards do limit themselves in achieving widespread adoption, either through limits to applicable projects or to specific geographic regions.

This detailed evaluation does however provide an insight into just how each standard goes about certifying projects and offers a large scope for understanding the intricacies of the

voluntary carbon market and certification standards. In a constantly evolving and rapidly changing market it is vital to understand these finer details and the differing mechanisms.

The collection of this information has allowed for the identification of the successful techniques that need to be incorporated or advanced upon in the design of a new standard, as well as the pitfalls of existing standards that need to be avoided and rectified. This will only serve to aid the standard development process and improve the outcomes. Ultimately the creation of new knowledge and techniques from this best practice identification process will allow for the development of a new ideas and methods that can be incorporated into the proposed South African voluntary carbon standard. This will aid in ensuring that offsets certified under the standard are real, reliable and permanent. This will allow the standard to be recognised within the market for its certification credentials. The development of new techniques and processes that are specifically focused towards South African conditions will attempt to stimulate the South African voluntary carbon market and allow for a cost efficient, straightforward process that South African offset projects can follow to gain certification. This will hopefully allow these projects to compete in the complex, turbulent and constantly evolving voluntary carbon market.

Table 3.4: Summary of the evaluated Voluntary Carbon Standards

	Verified Carbon Standard (VCS)	Gold Standard (GS)	VER+	CAR	ACR	CarbonFix	CCX	CCBS	SocialCarbon	Plan Vivo	Panda Standard
Baseline (BAU)	Project proponents' responsibility to choose and design suitable project specific methodology. Accepts CAR and CDM baseline methodologies. List of pre-approved methodologies. New project methodologies have to pass a double approval process.	Project proponents responsibility to design suitable project specific methodology if one does not exist. Accepts CDM EB, the SSWG or UNDP CF methodologies. New methodologies need approval by the GS technical advisory committee.	CDM baseline methodologies. A new project specific methodology can be developed and submitted for approval. The methodology has to be developed according to the guidelines for JI activities.	Standardised baseline approach. Prescribes the baseline methodology that has to be used for each individual project type.	ACR-approved tools, procedures and/or methodologies. Accepts methodologies from the CDM, USA EPA, CL or the VCS. New methodologies are reviewed by the ACRs expert methodology panel.	Standardised baseline calculation approach. A baseline calculation template is provided.	Project-specific or performance based methodologies.	Baseline determined using the IPCC 2006 guidelines for AFOLU projects. Required to document the effects on the community, biodiversity and the benefits that would have occurred without the offsetting project.	Establishes a baseline of the social, economic and environmental conditions to monitor co-benefit performance.	Baselines are project specific.	Currently no baselines New baselines will be allowed to be submitted to the PS technical committee. Will be approved in 50 working days from time of submission
Additionality	Three pronged project based additionality test. Performance and technology test also accepted.	Project-based additionality test required. CDM additionality tool or any other approved additionality tool. Extra guidelines for additionality.	Project-based additionality test. Three pronged CDM additionality test.	Standardised approach for project types.	Three pronged, project based additionality test Performance-based additionality tests also accepted.	Two different, mutually exclusive options. Three pronged CDM A/R additionality tool can be used, or CFS requirements for additionality must be used.	Primarily performance based. Projects have to prove that they are new, not regulated and involved in unusual, "best in class" practices. Reviewed by the CCX Offsets Committee	IPCC 2006 guidelines for AFOLU projects. Any approved methodology of the CDM EB	SC does not establish criteria for additionality. If a project developer relies solely on SC methodology it is advised that the project complies with the additionality guidelines of the CDM.	Project based additionality rules.	Both the project specific and performance standard additionality tests. Three pronged additionality test
Leakage	A/R project requires leakage assessments. Project-specific leakage calculations.	No detailed leakage assessment methodologies. Required as part of the baseline study. Evaluated in the verification phase.	VER+ does not specifically account for leakage concerns.	Comprehensive definition of GHG assessment boundary. Must include any and all SSRs associated with the project regardless of their physical location.	Project developers assess, account for and mitigate certain types of leakage. IPCC leakage guidelines.	Required to assess positive and negative leakage of wood and non-wood. Negatives have to be mitigated; positive leakage cannot be taken into account.	No project specific leakage assessment is required.	Project proponent is required to determine and prove all form of leakage associated with the project. Leakage has to be subtracted from the GHG offsets calculated.	SC does not establish criteria for leakage.	Leakage has to be assessed and mitigated for each land use activity. The local and regional characteristics need to be considered.	Requires that leakage is identified, assessed, accounted for and mitigated.
Permanence	Risk assessment mandatory Buffer pool established Size determined by risk assessment	Not included in the GS.	Risk assessment mandatory. Conservative buffer approach used. Buffer will not be less than 20% of the verified offsets.	GHGs to be stored for at least 100 years. Ensure permanence in 3 ways: Monitoring, Project Implementation Agreement (PIA), Buffer pool based on the risk rating.	Risk assessment mandatory. Buffer pool established, or ACR-approved insurance policy.	Strict permanence criteria. Evidence against protection from specific risks relating to forestry projects is required. CFS buffer fund requires that 30% of offsets are held as insurance.	Aims to ensure permanence of forest projects in three ways: 20% buffer pool, 15 year commitment and letter of intent.	Does not have specific permanence requirements. Relies on the permanence requirements of other standards.	SC does not establish criteria for permanence.	5 permanence mechanisms identified to be used. Including sales agreements and a 10% buffer pool.	Will develop risk assessment tools to identify and mitigate the reversal risks. Will utilise a buffer pool approach to insuring against reversal.
Co-Benefits	Not included in the VCS. AFOLU projects have to mitigate potential negative environmental and socio-economic impacts.	Projects must show clear sustainable development benefits. Four part detailed sustainability assessment. Continuous monitoring of sustainability required.	No substantial negative environmental or social effects, they need to be mitigated. EIA required if legally required by host country.	Must not create negative externalities.	Impacts on communities and the environment are positive overall. Promotes the use of CCBS tools.	Emphasis on the guarantee of the generation of co-benefits. Net-positive ecological and social impacts. Projects are rated according to their ecological and social co-benefits. Encourage joint use of CCBS standards.	Does not require the quantification or reporting of co-benefit. Projects have to comply with the regulations of the host country.	Emphasis on the generation of co-benefits for land based projects. Biodiversity, community and climate impacts. 14 basic compulsory requirements. Two levels of verification, Regular level and the Gold level.	Main aim to ensure significant contributions to sustainable development. Assesses the social, economic and environmental conditions of a project. Six sustainability indicators used to monitor projects	Emphasises on the generation of co-benefits from projects. Requires that all projects provide benefits to the environment and community. Community led sustainable land use systems.	Required for net positive impacts to be generated from projects. Poverty alleviation will be a key factor associated with project development.
Transparency	Documents available after projects have been registered. PDD, validation and verification reports available for public viewing.	Documents available after projects have been registered Documents available are PDDs, monitoring, local stakeholder consultation and validation reports.	All project documents are available on the registries website. These include the PDD, monitoring reports, verification reports and validation reports.	All the documents relating to each project are publicly available. Project submission form, project maps and monitoring and verification reports.	Details provided for each project. Documents include protocols, project plans and verification statements.	Each project allocated own website. All project documents are available.	No access to project specific documentation or for public comment.	All project documents are available. PDD, all public comments, validation reports and project certificates.	All project documents are available on the registry website.	A web page for each project.	No indication.
Public Participation	Stakeholder involvement follows ISO 14604-2 requirements. Access to documents and given opportunity to offer comments and inputs.	Two public consultation rounds are required Detailed procedures and requirements for stakeholder meetings. Local stakeholder consultation report has to be completed and submitted to obtain GS approval. A 60-day period prior to validation set aside for stakeholders to comment on the PDD.	Local stakeholder process, and global stakeholder process. Local public participation only has to be undertaken if it is required by national laws. If not, a justification of why has to be published within the PDD. Global stakeholder consultation - initial PDD published on the DOE's website for 30 days.	Does not outline any requirements for public participation or stakeholder consultation	Does not outline or indicate the need for any public participation process.	Strong emphasis on public participation in the accreditation process. Stakeholder consultation 3 months before or during every field visit is mandatory. Comments can be submitted at any time and are considered in the next certification process.	No requirements for public participation within the project design process. Only public participation is within the revision and development of new protocols for the CCX.	The project design must include the communities and stakeholders' involvement A public comments window of 30 days for documents. All grievances must be responded to in 30 days.	Data collected through participatory methods. Documented and presented with the PDD.	Project has to have undergone a producer/community led planning process	Public comments period of 20 days in the methodology approval process. No indications of public participation in the project design process
Registry	Three different registries, namely Markit, APX and Caisse des Depots. Unique serial numbers assigned to each offset emissions.	Uses the third party registry APX. GS does not partake in the transactions of VERs.	Own registry, the BlueRegistry. Project developers are forbidden from registering with any other registries.	Uses the third party registry APX. Unique serial numbers assigned to each offset emissions.	ACR runs its own registry. Unique serial numbers assigned to each offset emissions.	CFS uses the Markit registry. TZI and greenEye, are also options.	CCX utilises its own registry. Unique serial numbers assigned to each offset emissions.	Determined by standard that verifies and allocates VERs to the project. A unique serial is assigned.	Uses the Markit Environmental registry. Each credit has a unique serial number assigned.	Uses the Markit Environmental registry.	The registry will be internal and responsible for the issuance of credits.
Type of Credits	Ex-post credits only	Ex-ante and Ex-post credits	Ex-post and Ex-ante credits	Ex-post credits only	Ex-post credits only	Ex-post and Ex-ante credits	Ex-post credits only	Determined by the partnership standard	Determined by the partnership standard	Ex-ante credits only	Ex-post credits only
Third Party Auditing	Requires third party auditing and verification. Can be done at the same time. Verifies the emission reductions and the accuracy of them. If successfully validated, the project is automatically approved.	Requires third party auditing and verification. CDM DOEs perform third party auditing.	Requires third party auditing and verification. Eligible auditors are accredited CDM and JI auditors.	Requires third party verification, but not validation.	Requires third party auditing and verification. Verifiers need to be accredited under ISO 14065.	Pre-validation and verification is required. Initial certification to be conducted by a third party. Free to choose any certification body.	Require validation and verification Validation is done by the CCX Third party verification is required.	A third party auditor is required to validate and verify the project. SC accepts any independent organisation that is experienced in the validation/ verification of projects.	Plan Vivo requires the validation and verification of projects.	Third party validation will be required by the PS. One on site audit is required at validation.	
Field Verification Frequency	Field verification is only carried out once during the lifespan of the project.	Projects need to be visited by the verifiers in one of the first 2 years after the start of the crediting period. Subsequently once every 3 years.	A first verification is required 1 year after the registration or the start date of the project LULUCF projects - verification has to occur within 5 years after validation.	Within 30 months of being submitted. May not go longer than 6 years between verifications.	Verification is required no less than once every 5 years.	Initial certification 12 months after pre validation of the project. Regular certification must take place every 5 years project start date. Projects must be certified for at least 30 years after the project start.	Field verification of projects is after the project is approved. In-field verification has to be completed during the commitment period, every 2 - 4 years. Desktop audit is required in years which in-field verifications do not occur.	Project must be verified every 5 years. Based on the other standards requirements.	Verification is required within the first 5 years of a project.	Verification of PS projects will have to occur once every 5 years.	
Project Location	Projects can be located anywhere in the world.	Projects may be located in any country.	The VER+ can be applied globally.	Only projects within the USA.	Projects may be located in any country.	Projects can originate from anywhere in the world.	Accepts projects in any countries other than a member state of the EU ETS.	CCBS project may be located in any country of the world.	The SC methodology can be applied to any country.	Can only be located in developing countries.	Any project within the Peoples Republic of China.
Project Types (Eligibility)	All project types are allowed under VCS. Provided they are supported by a VCS approved methodology.	The GS only accepts two types of projects: Renewable energy and Energy efficiency	15 sectoral scopes defined by the UNFCCC. No nuclear energy and large hydro power plants.	Only projects that follow developed project protocols.	All projects supported by ACR approved methodologies	A/R projects	From methane combustion to forestry projects.	LULUCF projects only	No requirements.	LULUCF projects	No data.
Price of Offsets (Peters-Stanley et al., 2011)	US\$ 5/tCO2e	US\$12/tCO2e	US\$ 21/tCO2e	US\$ 7/tCO2e	US\$3/tCO2e	US\$18/tCO2e	US\$0.5/tCO2e	US\$4/tCO2e	US\$8/tCO2e	US\$9/ tCO2e	No data.

CHAPTER 4:

An Analysis of the Development of Sustainable Development Indicators and Voluntary Certification Standards in Multiple Environmental Sectors

4.1. Introduction

4.1.1. Purpose of Chapter

This chapter will focus on the historical development, challenges, criticisms and successes of various other voluntary environmental certification processes. Critical to this investigation will be surrounding how sustainable development measurement and evaluation has become to be operationalized and verified within these existing certification systems and if they have been successful in achieving their goals. The analysis of these will then provide a platform for the extraction of key lessons to be learnt that will serve to further guide the development of a comprehensive South African voluntary carbon standard. This will allow for the inclusion of current best practice contained within these certification systems, especially surrounding the inclusion of sustainable development considerations into the standard.

4.1.2. Certification in Context

Certification has evolved over the past 15 years as a key way to differentiate environmental or socially beneficial products from their conventional counterparts (Carothers et al., 2010). Certification labels aim to provide a voluntary supplement to the price mechanism, and guide choices of consumers towards responsibly and sustainably produced products. Despite this increasing activity and their increased adoption, even the most prominent of certification schemes only cover less than 10% of the market they are active in (Carothers et al., 2010). Comparable to any market-based systems differing certification bodies have arisen in competition due to the perceived weaknesses within other certification schemes. This has led to increasingly diverse and confusing marketplaces for certification, especially around what is considered to be sustainability. In spite of this certification has been shown to be feasible from an economic and technical perspective (Carothers et al., 2010).

Certification cannot be seen as the panacea to effective market transformation, rather it is one tool that can be used to influence producer and consumer behaviour. As most certification schemes are voluntary they can be flexible and innovate into levels that regulation does not cover. It is vital to understand that there are two parts to an environmental certification scheme, and that is the voluntary environmental program (VEP) and an eco-label.

4.1.3. Voluntary Environmental Programs (VEPs)

Carmin et al. (2003) define VEPs as programmes, codes, agreements and commitments that encourage organisations to voluntarily reduce their environmental impacts beyond the requirements established by the environmental regulatory system. VEPs have been promoted as a self-regulatory, efficient, flexible and an effective approach to environmental protection (Rivera and de Leon, 2008). However, these come in a variety of forms, from strictly voluntary initiatives with no standards, reporting or monitoring to certification programmes with specific performance-based requirements and consistent third party auditing and verification (Rivera and de Leon, 2008). They also differ widely in their aims, goals and industry focus. VEPs have become popular among corporations in that they have apparent win-win characteristics for all those involved. These characteristics relate to the development of a positive brand image, quality and safety assurance, increased market penetration and system coordination (Rivera and de Leon, 2008), while promoting environmental stewardship and the social co-benefits of these activities. Regulators see them as a soft policy option that can be used to stimulate strong consumer responses and as such stimulate a quality-oriented and process-oriented change in markets and attitudes (Giovannuci and Ponte, 2005). The most prevalent and well known VEP is that of the ISO 14001, this has been set at the international level to ensure that corporations design and implement effective environmental management systems, and currently there are over 66 000 participants in over a 100 countries (Rivera and de Leon, 2008).

4.1.4. Eco-Labeling

While VEPs aim to ensure that the environment is actively incorporated into the decisions of all participants in the programme, but for this to be communicated and highlighted they are often associated with an eco-label. Eco-labelling is a process that aims to evaluate products, projects or services against base criteria so as to evaluate their environmental credentials and impacts (Potts and Haward, 2007). The ISO defines eco-labelling as a voluntary, multiple-criteria based, third party program that awards a license that authorises the use of environmental labels on products. This licence is awarded on the basis of a life cycle assessment of the good, project or service in question (Potts and Haward, 2007). The main goal of eco-labelling is to inform consumers about the effects of the good, project or service on the environment. It aims to drive a change in consumption patterns towards consumers

making choices based on the environmentally friendly certification of the product, project or service (Potts and Haward, 2007).

Since the 1960's there have been numerous approaches used to move production systems towards becoming more sustainable and environmentally friendly. The first eco-labelling program was that of the German Blue Eco Angel in 1977 (Rivera and de Leon, 2008). Since then eco-labelling has gained increasing momentum worldwide and has given rise to a multitude of different certification schemes. Eco-labelling systems were initially started by NGOs and were thus voluntary, but eco-labelling of certain sectors has increasingly become mandatory, especially in the EU for food and consumer products (EU Eco-label) and the USA for energy efficiency (Energy Star) (Rivera and de Leon, 2008). Eco-labelling has become prevalent in a number of industries and sectors from certifying energy efficiency to environmental management systems, organic farming, sustainable fisheries and sustainable forest management (SFM).

As discussed earlier, eco-labelling and VEPs have aimed to improve and guide the actions of entire commercial sectors, but the concepts and practices of these two instruments have begun to be combined and have taken the form of voluntary certification standards. This has spurred the rapid increase in the number of differing certification instruments, especially within the forestry, fisheries and environmental management systems sectors. These are all aimed at incorporating and evaluating sustainable production or harvesting processes as well as evaluating the social and environmental performance of projects within their respective sectors. These have been developed as voluntary environmental certification standards that aim to ensure that the entire project process is sustainable; this is achieved through compliance with SD criteria dictated in the standard and subsequent third party verification. In turn this provides increased information to potential consumers about the project, good or service and its environmental and social impacts (Giovannucci and Ponte, 2005). Each of these voluntary certification standard has differing ideals, goals, processes and measurements but the overarching goal of all of them is to ensure that goods, projects and/or services that they certify incorporates sustainable practices and that this information is passed on to the eventual buyer.

4.1.5. Value of Analysis for this Study

These environmental certification programmes have existed for a lot longer than current voluntary carbon standards. Understanding how they have established themselves as leading and widely accepted standards offers a myriad of lessons to be learnt for the development of a new voluntary environmental certification standard, in the case of this thesis a voluntary carbon standard.

The standards that will be focussed on are the ISO 14001 environmental management system standards, voluntary standards in the forestry sector, such as FSC and the Program for Endorsement of Forest Certification (PEFC), and standards for sustainable fisheries (e.g. MSC and Friends of the Sea, FOS). A critical evaluation of their development, content, successes and failures will allow for the incorporation and avoidance of the lessons from other sectors into the development of a voluntary carbon standard.

4.2. Sustainable Development, Certification and Indicators

4.2.1. Sustainable Development

SD has become a diverse, wide ranging and highly contentious topic. SD is classically portrayed as the interaction between environmental, economic and social systems (Figure 4.1.) (Goodland and Daly, 1996).

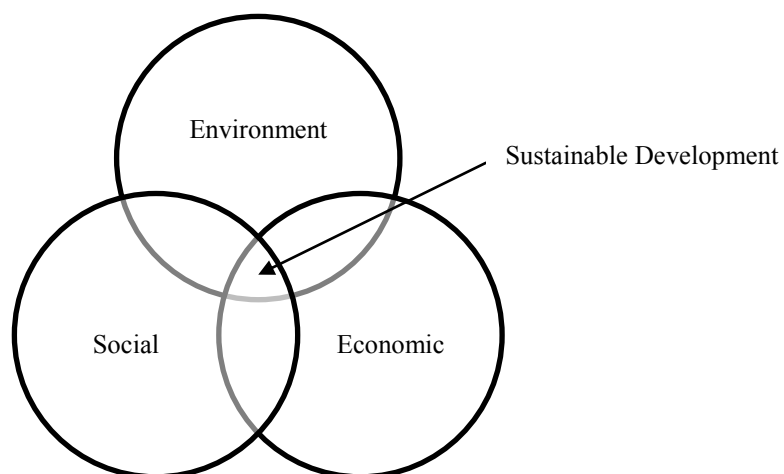


Figure 4.1. Sustainable Development (adapted from Goodland and Daly, 1996)

It differs from traditional theories of development as the philosophical focus is on improving the quality of life of people at the present moment without degrading the environmental and

natural resources for future generations (Bell and Morse, 2003). SD has become a contentious issue surrounding what the reality of ensuring SD in practice actually is. The extent of the application of SD principles relies on the perception of the people involved in applying them (Meppem and Gill, 1998). Templet (1995) argues that SD is all about equity, not just inter-generational but also within the same generation. The very basis of SD is participatory in nature and this is enshrined in Principle 10 of the Rio Declaration on Environment and Development:

“Environmental issues are best handled with the participation of all concerned citizens. Each individual should have... the opportunity to participate in the decision making process” (Bell and Morse, 2003).

This principle is highly relevant, but the practical implication to identifying and engaging with all stakeholders to ensure SD determination is highly complex. SD means very different things to different people and it is how an individual rationalises and interprets SD that will ultimately affect their viewpoints (Bell and Morse, 2003). Recognising this diversity in perceptions is a key step to operationalizing SD, in that it moves SD from a purely scientific definition into a process that recognises that diversity is inherent to SD development and implementation (Meppem and Gill, 1998). SD has always been intended to be a practical process but the definitions, perspectives and requirements surrounding SD implementation have become bogged down in scientific debate and technicalities (Reed et al., 2006).

Although the precise meaning of SD in any one context may differ and be open to debate due to differing stakeholder viewpoints, it is necessary to measure the effectiveness of SD. This is reinforced by Bell and Morse (2003) who state that ‘assessment is a necessity for action’. To assess SD many differing tools and techniques have been developed to gauge progress, but there is not one definitive method used that is currently acceptable and applicable across all scales (Bell and Morse, 2003, Rempel et al., 2004).

4.2.2. Sustainable Development Indicators

The most popular approach to gauging SD has been the development of indicators and indices (Reed et al., 2006) and in turn has become a major part of policy development (Reed et al., 2006). Gallopin (1997) has defined indicators as ‘an operational representation of an attribute of a system’. However the development of appropriate indicators has also become

highly complex and controversial as not one recognised dominant system has emerged that dictates the development of effective indicators.

The purpose of an indicator is to simplify complex systems into a number of variables through targeted assessment and measurement. These can then be used to guide the project towards achieving true SD objectives. In this it has been stated that indicators are the primary tool for “doing” sustainable development (Bell and Morse, 2003). Indicators aim to measure and represent specific issues or concerns, and if they fail to achieve this they are simply measurements with no bearing on informing management or monitoring (Rempel et al., 2004). Kneeshaw et al. (2000) identify two main types of indicators, prescriptive and evaluative. Prescriptive (or compliance) indicators stipulate the future project conditions and check on the activities that were promised, while evaluative (or effectiveness) indicators test whether the future conditions have been met and measure the response of the system to management activities (Rempel et al., 2004, Heink and Kowarik, 2010). Developing and incorporating indicators in the certification process that do not provide the correct information or measurements could lead to a false representation of a project’s sustainable development credentials (Nasi and Frost, 2009).

Conceptually McCool and Stankey (2004) identify three important roles that indicators play in SD assessment. Firstly they depict the existing conditions (establish a baseline) of systems that are often complex, multi-faceted and interdependent. Secondly, they allow for adaptive management in evaluating the performance of management activities, and thirdly they facilitate for the early warning of change in social, environmental, cultural or economic systems. As a result of this they allow for the continued adaptive management of complex environmental systems and interactions. However due to the popularity of the top-down approach to designing indicators they have become to be seen as cold and technical, that have been corrupted by the scientific desire to place a numerical value on all aspects of a system (McCool and Stankey, 2004).

Reed et al. (2006) show that indicator development falls into two broad methodological paradigms, one that is expert-led and one that is community-led. The expert-led process for developing indicators is based on the scientific need to quantify complexities within dynamic systems. This methodology has been widely used in disciplines such as landscape ecology, conservation biology and economics (Reed et al., 2006). The community led approach is based on a bottom up approach to developing indicators and draws on social sciences,

including social anthropology, adult education and development studies. This approach argues that to set goals and priorities it is vital that social actors are involved (Reed et al., 2006).

There are numerous strengths and weaknesses to each approach. The top-down approach allows for a rigorous process that is scrutinised by experts and assessed for relevance using statistical techniques, however this process often fails to engage local communities. The bottom-up approach is rooted in the understanding of local context and uses this as a source of indicator development, as well as enhancing community capacity for learning and understanding. However these indicators might not have the capacity to accurately or reliably monitor the necessary processes or actions that contribute to sustainability (Reed et al., 2006). These two approaches are thus conceptually different; although both systems have the same end goal. There is a need to develop a hybrid approach to capture both knowledge areas, but as yet there is no consensus on the best methodology to achieve this (Thomas and Twyman, 2004; Reed et al., 2006; and Mascarenhas et al., 2010).

While utilising indicators is a logical and practical step towards operationalizing SD, Bell and Morse (2003) highlight a number of key questions that relate to the practical development and application of SD indicators:

- What indicators should one select?
- Who selects them?
- Why are they selected?
- What are they meant to achieve?
- What about the balance between various dimensions of SD?
- How are the indicators to be measured?
- How are the indicators to be interpreted, and by whom?
- How are the results going to be communicated, to whom and for what purpose?
- How are the indicators to be used?

How the development process of the indicators answers these questions is pivotal to the design process. Since indicators are multi-faceted, complex and often highly contested areas, these questions offer a lot of room for value judgement. Traditionally these questions have not explicitly excluded the development of qualitative indicators but they have been more aligned and conducive to the development of quantitative ones. The way one views SD and

interprets these questions, depending on the project, will automatically cause conflict with other SD indicator designs. This has spurred the design of a number of SD indicators rules and checklists that attempt to guide the development of 'relevant' indicators (Bell and Morse, 2003). These authors' detail that an indicator should be:

- Specific (must clearly relate to outcomes)
- Measurable (implies that it must be quantitative)
- Usable (practical)
- Sensitive (must change as circumstances change)
- Available (straightforward to collect relevant data)
- Cost-effective (not be expensive to collect data)

Another list of criteria has been developed by Guy and Kilbert (1998), who detail a list of suggestions to guide SD indicator development:

- Community involvement (were they developed and accepted by stakeholders?).
- Linkage (do they link social, economic and environmental issues?).
- Valid (do they measure something that is relevant?).
- Available and timely (is the data available on a regular basis?).
- Stable and reliable (are they compiled using a systematic method?).
- Understandable (are they simple enough to be understood by lay persons?).
- Responsive (do they respond quickly and measurably to change?).
- Policy relevance (are they relevant to policy?).
- Representative (do they cover the important dimensions of the area?).
- Flexible (will the data be available in the future?).
- Proactive (do they act as a warning rather than measure an existing state?).

While there have been various lists developed (e.g. Guy and Kilbert, 1998; Fisher 2001; Bell and Morse, 2003; Hanson, 2003 and Rees et al., 2006) surrounding the preferred characteristics of indicators, Rees et al. (2008) developed a summary list from a wide variety of indicator lists to determine the common characteristics that comprise an ideal indicator. They highlighted ten common characteristics:

- Capable of conveying information that is responsive and meaningful to decision-making (directly tied to management questions and linked to goals).

- Linked to a conceptual stressor – response framework (the ability to communicate potential cause – effect relationships).
- Capable of measuring change, or its absence, with confidence.
- Highly sensitive and anticipatory (early warning system).
- Applicable over a variety of spatial scales and conditions.
- Desirable operationally (easy to measure, reproducible with minimum measurement error, costs effective).
- Integrative (serves multiple indicator purposes).
- Non-destructive.
- Easy to understand and communicate.
- Scientifically and legally defensible (robust to peer review and wider challenge).

McCool and Stankey (2004) however argue that lists or rules such as those of Guy and Kilbert (1998), Bell and Morse (2003) and Rees et al. (2008) frame the selection of indicators as a technical/scientific problem rather than a political/social challenge and thus do not or cannot achieve their sustainability goals. This is evident in that it is increasingly claimed by implementers that indicators provide few benefits to actual users for which they are intended (Reed et al., 2006). While the reasoning underlying why science has had a privileged position in the indicator design and selection process is valid, there is a need for the incorporation of a multi-stakeholder perspective in the indicators design process. The environments within which SD is implemented are highly variable, complex and dynamic and are often characterised by competing and conflicting values and interests (McCool and Stankey, 2004). A bottom-up, community led approach has been emphasised as one way of bridging this gap (McCool and Stankey, 2004; Fraser et al., 2006; Reed et al., 2006; Turnhout et al., 2007). However the methodology to actively engage stakeholders has been highly debated (Bell and Morse, 2003).

Involving stakeholders in the process as early as possible allows for a quality control process that leads to the development and acceptance indicators (Turnhout et al., 2007). SD indicators will only truly work if they are developed in partnership between scientists and the communities they intend to help, and as such provide their intended management and information benefits.. Bell and Morse (2003) argue that SD indicators have been mired in developing technical excellence rather than assisting managers to manage. This has been reiterated by Rametsteiner et al. (2011) who argue that the development of indicators has

been rooted in the scientific ‘knowledge production’ sphere rather than in the inherent political ‘norm creation’ aspect of indicators. Recognising this is a key step to creating indicators that can be effectively implemented and accepted.

To be useful in a management context indicators have to be set and measured on a regular basis. The information they gather needs to answer the vital questions of the context in which they are applied, as well as being easily interpreted and communicated to all stakeholders (Bell and Morse, 2003). Thus considering the SD indicator framework and monitoring approach to indicators is a crucial component of their development and operationalization.

4.2.3. Sustainable Development Indicator Frameworks

A SD indicator framework attempts to separate a broader environmental situation into various elements in an attempt to fully describe and understand it (Lundberg et al., 2009). A key role of a SD indicator framework is to structure indicators in a systematic manner to aid interpretation, understanding and implementation (Gambarelli and Bucher, 2002). They also allow for the understanding of the interconnectedness of indicators and how they function together to obtain the required outcomes of an indicator set. SD indicator frameworks have been widely used at national levels, such as countrywide State of the Environment reports (SoERs). This has generally taken the form of a causal framework characterised by identifying Drivers, Pressures, State, Impacts, and Responses (DPSIR) (Lundberg et al., 2009). Indicators are then developed for each of these elements as a way of describing the status of the specific element. While these have been widely used at the national, regional and international scale, they have not translated well into use for local and project level SD evaluations (Segnestam, 2002). These shortcomings lie in the complexities and costs associated with evaluating and collecting the data required for each indicator developed within this framework, especially at an individual or regional level (Gambarelli and Bucher, 2002).

The United Nations (2001) however highlight that a framework by itself is an imperfect tool for organising and expressing the complexities and inter-relationships that encompasses the full ambit of assessing sustainable development. In response to this the framework has to be designed to meet the needs and priorities of the end users, only then will it be truly useful (United Nations, 2001). The World Bank reiterates this and states that the design of any monitoring and evaluation system and the identification of suitable indicators should be

directly derived from the projects specific developmental goals (Ayres et al., 2010; Bowen and Riley, 2003). As discussed earlier, the development of sustainable development indicator frameworks that can be applied at a project level, has been more complicated and complex.

This has led to the development of the Input- Output-Outcome – Impacts (IOOI) framework that has been designed and used in monitoring the effectiveness of local level projects where an objective is to improve the state of the environment (Segnestam, 2002). This allows for the development of a robust framework to assist in the design of indicators and processes that can be directly applied at a project level rather than a national or regional level, and thus mainstreamed for project developers. This framework signals a movement from a traditional, broad DPSIR framework to a simplified indicator framework (Ayres et al., 2010) that is useful for a local context.

4.3. Examples of Third Party Certification Standards

The incorporation of SD indicators and frameworks has become immensely popular in current voluntary environmental certification programmes. The aim of these programmes is to develop a set of principles and criteria that actively ‘do’ and ensure sustainable development and almost universally they have chosen indicators and indicator frameworks as the main tool to achieve this. The certification bodies develop a set of principles, criteria and indicators that each project has to abide by in order to achieve certification. If the criteria set out in the certification guidelines are achieved then the project is deemed to be sustainable, but have these been successful? Has the incorporation of indicators into the certification process actually led to the increased sustainability of projects? This leads back to some of the original questions asked: are sustainable indicators and frameworks the best tools for operationalizing SD objectives, and if not how can it be done? Analysing literature from the sectors that have embraced and promoted the use of SD indicators in certification projects provide useful case studies to understand if they have fulfilled their objectives and goals.

4.3.1 Sustainable Forestry Certification

The current process of forest certification emerged in the 1990s to address public concerns surrounding rapid deforestation, especially in the tropics (Merry and Carter 1996, Kiekens, 2003). In 1992, at the Earth Summit, the Agenda 21 Forestry Principles set out an action plan for the development of sustainably managed forests; it was within this forum that the process

of identifying and developing criteria for sustainable forest management principles was developed.

In parallel to this, a voluntary approach to forest certification was initiated through a variety of NGOs which culminated in the establishment of the Forest Stewardship Council (FSC) (Perera and Vlosky, 2006). Voluntary forest certification standards have been designed to meet the aims of sustainable forest management (SFM). Projects are evaluated and certified against the criteria and indicators designed to ensure that projects abide by the aims of SFM (Rametsteiner and Simula, 2003). This allows for a third party approach to certification, which results in a written certification being issued by an independent third party, attesting to the location and sustainable management status of a forest that is producing timber (Perera and Vlosky, 2006). It aims to provide consumers of these timber products with a credible guarantee that the product comes from timber forests that are environmentally responsible, socially beneficial and economically viable (Perera and Vlosky, 2006). There are two essential components of any forest certification scheme, 1) forest management activities and operations are assessed against pre-determined principles and criteria; and 2) there is both forest management certification and product certification that provides the necessary information to the end consumer (Perera and Vlosky, 2006).

The forest certification market has seen the varying development of scale and scope of the current certification standards. This has resulted in the emergence of four major schemes worldwide; however there has also been the development of a number of other programs aimed at national and regional initiatives. As mentioned earlier, the main forestry certification schemes that have emerged are the FSC, PEFC, ISO 14000 and Sustainable Forestry Initiative (SFI). The FSC and PEFC have dominated the market and many other players have been absorbed by them, in particular by the PEFC. The PEFC is the largest certification framework in terms of forest area with 225 million hectares certified and has endorsed 28 national programs in 28 countries worldwide, mainly in temperate and boreal forests (UNECE, 2010). The FSC has certified forest area of 129 million hectares in 13 countries. The FSC penetrates most areas of the world but large gaps remain in tropical Africa and South East Asia and developing countries (UNECE, 2010). Combined, they account for 355 million hectares of certified forests or 9% of global forest cover. The adoption of forestry certification has been rapid in developed countries but has been lagging in developing countries. Durst et al (2006) highlight that developing countries, in particular,

face large barriers to certification with only 13% of certified forests. The main reasons highlighted are the high direct and indirect costs associated with obtaining certification along with the insufficient capacity to implement sustainable management of forests, weak implementation of national forest policy and a number of others. Despite these challenges and constraints many developing countries are still willing to pursue certification and thus there entry needs to be facilitated.

This has seen the certification of natural forests predominantly in Europe and North America, and a large percentage of plantation forests worldwide (Perera and Vlosky, 2006). There has also been the establishment of a number of competing voluntary forest certification organisations which has led to increased competition and the broadening of forest certification from tropical forest to temperate and boreal forests (Perera and Vlosky, 2006). These have all focussed at differing scales and gone about certifying forests in different ways.

Each certifying body sets guidelines that have to be followed by those seeking certification, these may be performance-based or systems-based. The FSC has undertaken to set a performance-oriented approach to forestry certification. The FSC requires that specific actions, practices and outcomes are documented and adhered to in order to obtain certification (Fischer et al., 2005). Adhering to and achieving these criteria allows for the project to utilise the 'FSC certified' logo in marketing products from the forest. The PEFC takes a different approach to the FSC in that it has established a framework for the development and acceptance of national or sub-national certification schemes (Fischer et al., 2005). The PEFC has become an umbrella organisation which facilitates the recognition of a number of national or regional standards (Perera and Vlosky, 2006). The PEFC encourages a bottom up approach to a multi-stakeholder standard development process (Perera and Vlosky, 2006).

The FSC has developed a global standard for its definition of well-managed forests and this includes ten principles and 56 criteria of sustainable forest management. These cover key issues such as land tenure rights to indigenous people's rights, maintaining biodiversity and forest planning, monitoring and management (Auld et al., 2008). The FSC takes two routes to standard development; the first of these is a national, local or regional tailoring of the broad FSC principles to meet that areas unique scenarios. This is done in a process that ecological, economic and social stakeholders collaborate to identify the principles and criteria that apply. These are then submitted to the FSC board for approval. The second route, and can only be

pursued if a region specific standard does not exist, is the use of the global FSC standard by a project. The PEFC follows a similar route to the FSC by outlining broad principles and criteria and only accepts and endorses nationally-based certification schemes that abide by these.

Wood (2000) examined eight forestry certification standards and found that although there are commonalities between the standards, there are also major discrepancies and inconsistencies between standards which inject confusion into the market. Van Kuijk et al. (2009) argue that certification of a forest does not necessarily lead to or allow for the claim of the forest being sustainability managed. The difference arises in how sustainability is defined within each standard and what aspects are assessed and evaluated, as highlighted earlier in this chapter. They argue that in reality there are trade-offs, differing definitions, and knowledge and data limitations to accurately and holistically evaluating and assessing all aspects of sustainable forestry certification schemes (van Kuijk et al., 2009). These limitations add questions to what forestry certification standards can legitimately claim to be sustainable forestry projects. Rametsteiner and Simula (2003) state that the various voluntary certification standards do establish higher levels of requirements on forest management than current legislation. They establish criteria that are not currently addressed by legislation, in particular towards mandatory sustainable forest management principles and practices and it is these that contribute to SD objectives (van Kuijk et al., 2009).

Van Kuijk et al. (2009) reviewed 67 studies on the effects of forest management certification on biodiversity and concluded that the forest management practices, in general, arising from certification leads to increased biodiversity protection and sustainable forest management practices. Therefore it has been found that certified sustainable forestry good practices encouraged by the various standards, in spite of their differences, mitigate many of the negative effects associated with logging and forest management activities. This highlights the benefits of the requirements laid out in a forestry certification system can have on ensuring that projects reduce their impact on the environment.

4.3.2. Sustainable Fisheries Certification

Sustainable fisheries certification began in 1996 when the WWF and Unilever entered into a partnership and established the Marine Stewardship Council (MSC) to create an eco-label for responsible fisheries management. This was created out of a dual vision of securing long term

supplies of fish for global markets and of creating a viable, alternative tool to halt or reverse the decline in global fish stocks (Agnew et al., 2006). The MSC aimed to adapt the model created by the FSC and apply it to developing a comprehensive labelling initiative for fisheries (Auld, 2007). The MSC aimed to create a streamlined organisation with little bureaucracy that can operate strategically. This led to the MSC being launched as an independent non-profit organisation in 1997. The principles and criteria of the MSC were developed after a two year process that included global stakeholder consultation and input (Auld, 2007). The MSC is a voluntary process that employs a standard against which fisheries are measured by an independent third party. This standard is based upon three fundamental elements that contribute to sustainable fisheries and fisheries that pass this standard are certified and allowed to claim that their products come from a well-managed and sustainable fishery (Potts and Haward, 2007).

In response, and as added competition to the MSC, the FOS standards setting and certification body emerged in 2006. The FOS is an NGO that aims to conserve the marine habitat and is the only organisation that sets standards for both sustainable fisheries and aquaculture practices. The FOS has become an international certification project that utilises independent third party certification auditors to ensure that projects abide by and certify its sustainable fisheries credentials. The FOS subscribes to the United Nation Food and Agriculture Organisations standards of good practice in developing and designing assessments of fisheries. By the end of 2010 the MSC and FOS have certified 98 and 30 fisheries respectively. Fisheries standards aim to ensure that ecosystem management practices of the certified industry are higher than that of the current mainstream management practices (Agnew et al., 2006). This has led to an expectation of sustainable environmental improvement in fisheries that achieve certification.

Each standard develops and sets individual principles and criteria that have to be followed for fisheries that gain certification. The FOS sets a number of detailed criteria that need to be met to obtain certification and use of their eco-label on products, while the MSC sets overarching principles and criteria that are used as the basis to develop a set of specific indicators and benchmarks against which each fishery is individually assessed (Potts and Haward, 2007). A fishery is assessed against the criteria and individual indicators and successful certification allows the products to carry the 'MSC' logo. However these individual methods of certifying fisheries have called into question the legitimacy of some of the fisheries certified (Ward,

2008). It is argued that the MSC has developed a poorly expressed environmental standard which has allowed for differing interpretations among certifiers, leading to an inability to accurately compare the credentials of the different certified fisheries (Ward, 2008, Jacquet et al., 2010). Fisheries certification faces the same challenges and shortcomings as forestry certification. With debates surrounding the definition and requirements of what determines sustainable fisheries, differing development of indicators, interpretations and bias by certifiers and the lack of data and knowledge about long term viability of fish stocks and fisheries have all led to the questions of whether fisheries certification actually promotes the sustainable management of fish stocks (Ponte, 2008, Jacquet et al., 2010).

Goyert et al (2010) investigated whether the costs of MSC certification are actually worth it for the industry. They found that currently MSC certification is currently unable to offer the price premiums needed to incentivise the process of certification for fisheries. While this is the case it is necessary to understand if certified fisheries have sustainable development benefits. Agnew et al. (2006) set out to examine if MSC certification had his impact. They selected 10 fisheries that had received MSC certification and had gone through a first audit phase. They found that all the fisheries that had been certified had shown some SD benefits that result from the certification process (Agnew et al., 2006). This does not necessarily mean that the fishery is anywhere near untouched but does show a positive trend towards good environmental performance. They highlight two important lessons learnt from the process: 1) the biggest gains seem to arise in areas where conditions for certification were attached and 2) the authors argue that ‘difficult fisheries’ should be encouraged to apply for certification.

Ponte (2008) points out that while certification is deemed to be a good tool for fisheries, the stricter certification criteria needed to ensure environmental benefits makes it more difficult to obtain certification, thus decreases the incentives of fisheries to apply. There are therefore trade-offs within the certification process. Agnew et al. (2006) do however acknowledge that all of these environmental benefits cannot be definitively linked to the role of certification, rather they state that: “environmental gains have flowed from the conditions (during the certification process) set, and have been generated independently of conditions, at time scales that are coincident with, or appear to have been stimulated by, the certification process.” There does however seem to be a strong link between stringent criteria, which are operationalized through indicators, and the environmental improvements of a project.

4.3.3. Environmental Management Systems

Environmental Management Systems (EMS) aim to ensure that environmental considerations are incorporated into organisational management structures, so as to reduce their impacts on the environment (Rondinelli and Vastag, 2000). The premier and dominant EMS has become the ISO 14000 suite of guidelines, which are a family of voluntary standards and guidance documents to help organisations internalise environmental issues and reduce their impacts. The family of standards ranges from environmental management systems to EMS auditing, environmental labelling and life cycle assessment. The ISO 14001 standards have become the world's largest VEP with 130,000 organisations certified (Nawrocka and Parker, 2009). This has attracted interest from industry, policy makers and has become vital, in some cases, that companies are ISO 14000 compliant (Sambasivan and Fei, 2008). Often obtaining certification is viewed by some companies as an entrance to global competitiveness, while in some cases it is mandatory for companies to obtain ISO certification to supply and partner with other companies (Sambasivan and Fei, 2008). This has led to the ISO 14000 EMS standards becoming virtually mandatory within some industries to remain competitive.

The ISO process of obtaining certification is voluntary, it sets out 17 guidelines that a business has to follow and implement. Once this has been done an independent auditor accredited by the ISO evaluates whether the company fully abides by the guidelines. A company that does fulfil all the ISO 14001 guidelines and is found to be compliant are allowed to claim their environmental credentials. The ISO 14000 brand has become a global mark of environmental best practice and the most successful voluntary environmental standard, in terms of acceptance and implementation (Gavronski et al., 2008). It has been argued that obtaining ISO 14001 criteria does not actually initiate the required change in behaviour, rather it is used as a form of 'green washing' as it only focuses on downstream consequences rather than upstream causes and the underlying principles of unsustainable behaviour (Macdonald, 2005). The ISO relies on the principles of "continual improvement" that guide the business actions, without any identification of ultimate objectives that comply with the basic principles for sustainability. This has led to the ISO 14000 standard being described as vague and one that does not incorporate the true end goal of sustainability (MacDonald, 2005).

The ISO 14000 uses a system of qualitative sustainability indicators to address the issue of environmental performance; however it does not establish an end goal or objective for

projects. Individual environmental targets are set for each organisation, but these are not substantive in nature and thus the level of targets varies significantly across sectors, industries and individuals (Nawrocka and Parker, 2009). Thereby the indicators used to assess if the targets set have been reached are not actually a measure of sustainability; rather it is a measure of a case-by-case basis from differing baseline scenarios working towards differing end goals. This moves the organisation on a path towards sustainability but does not ensure that an organisation is achieving the optimum level of ‘green’ practices.

Nawrocka and Parker (2009) conducted a meta-study of 23 articles that aimed to analyse the connection between EMS adoption and improved environmental performance. It was found that the differing baselines and end targets distort, confuse and complicate the measurement of what actually constitutes overall improved environmental performance and that thus the connection between ISO 14000 adoption and environmental performance and sustainability cannot be proven or substantiated. It is this reality that has led to the argument ISO 14000 implementation is merely a form of ‘green washing’ rather than a concerted effort to improve environmental performance, and thus contribute to sustainable development.

4.4. Lessons to be learnt for Voluntary Carbon Certification and SD Indicator Development

The analysis the development of SD indicators and their application in some of the largest and most widespread VEPs has identified a number of lessons for the development of new certification standards, in particular surrounding the incorporation of SD indicators into the proposed development of a South African voluntary carbon standard within this thesis.

4.4.1. Principles and Criteria of SD Indicators and Certification

Section 4.2.2 highlights the debate around what constitutes an effective indicator and its applicability in moving towards ‘doing’ SD. There is only one agreement; that SD is a complex issue and that there is no single, definitive indicator measurement of SD (Bossel, 2000). There has been a strong trend towards the development of SD indicators as a key step to incorporating SD goals in the certification process. Success has stemmed from the establishment of standard-specific, overarching principles and criteria that are used to guide and establish standard-specific end goals. These broad objectives of each certification system are then used to guide, and focus the development of indicators used by each standard with the aim to operationalise the objectives and the SD criteria detailed in each standard. A key lesson to be learnt from this analysis is that the effectiveness of the standard is based on the

motivations and goals (principles and criteria) upon which it is constructed. The development of a standard is a highly political and complex process between all those involved and that has to be carefully managed. Failure to manage this process brings into doubt the legitimacy of the certification process as it might be construed to become a form of ‘green washing’ that suits the agendas of certain individuals.

While there is undoubtedly pressure on the developers of certification standards to incorporate more lenient requirements within the standard, it is imperative that they do not. Leniency has appeared in a number of certification processes and a key area is the lack of a definitive end goal (or overarching principle) of sustainability that every prospective project is measured against. The evolution of individual, project-specific criteria and indicators (both of the MSC and ISO 14000) has called into question the legitimacy of the claim to sustainable development of the projects that obtain certification under these standards.

The independent findings of Agnew et al. (2006) and van Kuyjk et al. (2009) in different certification sectors (MSC and FSC, respectively) reinforce that establishing specific indicators for measuring SD objectives are a viable way of operationalizing sustainable resource management goals. In both it has been shown the requirements outlined in the prescribed indicators greatly contributed to moving the certified programs to a more sustainable development path. This in contrast to Nawrocka and Parker (2009) who highlight that the success of ISO 14000 in internalising SD is inconclusive, as this process is individualistic and distorts the actual, concrete measurement towards any real SD progress. A main reason could be due to lack of universal indicators mandated in the certification process that subjects every prospective project to the same process of validation and verification. The call has been the same, though to differing extents, through every certification sector evaluated as the differing indicators amongst certification standards within the markets and even within individual standard has added complexity, uncertainty and subjectivity to the process.

4.4.2. Incorporating Local Context into SD Indicator Development

The complexity of setting and developing standards is vast due to the complexity of different geographical regions, management regimes and stakeholders. The concept of sustainability is highly diverse and differs depending on the geographical, social, ecological and economic context within which the project is situated. This complexity has resulted in a call from

Rametsteiner and Simula (2003) for forest management standards to be based on, and adapted to, the regional or local conditions, both with regard to ecological and socio-economic circumstances. This is in line with van Kuijk et al. (2009) who argue that the criteria and principles of forest management certification are universal; however local context needs to be incorporated into the design of the indicators to determine the sustainability of forestry projects. As discussed in sections 4.3.1 and 4.3.2, this has been reinforced in the development of both the FSC and MSC standards setting broad criteria and principles that projects have to meet and then subsequently unique indicators are developed either nationally (FSC) or for each project (MSC) that are based on specific conditions (Potts and Haward, 2007). This uniqueness translates into a high specificity of indicators for sustainability in each location either regional or project specific, that reflects the diversity of local conditions, challenges and stakeholder views (Gullison, 2003). This reflects well with the call from Peskett et al. (2007) for voluntary carbon standards to be designed to meet the different objectives of the differing offsetting schemes, the process of developing these project specific indicators however is still highly debated (Mascarenhas et al., 2010).

The FSC has arguably been the most successful certification system reviewed; the findings of van Kuijk et al. (2009) highlight this. The success of the FSC is attributed to their development of regionally-specific indicators that follow guidelines set by broad principles and criteria. This allows for all the projects to be assessed under the same system, but subject to regional-level criteria. These are then indicators designed to be applicable at a scale suitable for the necessary detailed information to be gathered surrounding a projects sustainable development potential and progress.

4.4.3. SD indicator Frameworks

Section 4.2.3 highlighted that the role SD indicator frameworks play in developing and operationalizing SD is essential. The choice of an efficient, simple and practical framework allows for the practical implementation, monitoring and understanding of the certification standards SD indicators and their goals. However there are no distinct, conventional

The organisational framework is an important starting point for the development and implementation of indicators and as can be seen with the certification standards highlighted above, and combined with the lessons learnt from the voluntary carbon standards, there is no single best practice guiding SD indicator framework development. They need to be based on

a sound and factual basis but also actively incorporate local and user specific context to make them capable of achieving their intended outcomes. There is however no single recognised standard SD indicator framework that is used either by in one certification sector, eg forestry, or across sectors. All the certification standards reviewed here utilise their own SD framework to arrange and organise the indicators. These frameworks usually take the form of a modified version of existing frameworks such as the DPSIR or IOOI frameworks. While these are essential starting points, this analysis highlights that in order to useful the framework has to be designed to be used in the context that the standard will be applied.

4.4.4. Third Party Certification

The issue of independent, third party certification has also emerged as a key area that needs to be refined and considered within general certification design. In many cases, amongst all the certification systems reviewed, there have been instances where differing interpretations amongst differing independent, third party certifiers has led to the distorting of the overall rules and the certification of projects that do not abide by the certification principles. This has been highlighted in the MSC process which Jacquet et al. (2010) states allows for the “loose interpretations of its rules” by independent, third party certifiers and this leads to accreditation of fisheries that are not sustainable. One of the main reasons for this is that leniency comes with an economic incentive for independent certifiers, as those that interpret the rules more leniently will obtain more continuous work during the annual audit phase (Jacquet et al., 2010). This is not unique to the MSC process only, and is prevalent in both the FSC and ISO 14000 certification system and is a problem inherent to the whole third party certification process. Differing certifier’s perceptions and interpretations of standard principles and guidelines leads to the accreditation of projects that do not meet the intended initial outcomes of what the certification system was designed to do. This leads to a broader failure in the process as it reduces the amount of trust and credibility within the standard by both potential projects and end consumers and as such reduces the effectiveness of the standard. Trust is integral to the success of a certification system and this need to be rapidly addressed and the appropriate mechanisms developed that ensure the integrity and validity of new third – party certification systems, such as a new voluntary carbon standard.

4.4.5. Costs, Complexities and Public Participation

The practicalities and costs of adoption and compliance with certification systems have also been noted as a challenge, in particular for small, scale projects within developing countries (Goyert et al., 2010; Durst et al., 2006). Carothers et al. (2010) argue that this is a result of existing certification schemes focussing more on the development of the standard, then how the standard will be adopted and implemented. Many developing country projects that aim to attain certification are not only hampered by complex, expensive and bureaucratic certification processes but they are also constrained by systematic challenges such as limited availability of reliable data and monitoring challenges. Gough et al. (2008) argue that the SD assessments within standards are relatively expensive, time consuming undertakings and the reliance upon experts for SD evaluation, which is often the case in existing voluntary certification standards, and can push both the budget and time frames past the limits that are viable for a small project and monitoring program.

Fraser et al. (2006) used the ‘Wellbeing Assessment from the Coast Information Team’ in British Columbia as a key example of where protracted public participation processes leads to a part failure in the indicator assessment process. This assessment relied heavily on an extensive, complex community consultation process that took up far more time than originally planned for and this in turn led to cost overruns because of missed deadlines while still producing skewed indicators. Communities however did feel more empowered after the process and disenfranchised residents were able to access policy makers. There is however a demand for quick, efficient and useful indicators and at the same time a desire to validate these through a public participation process. It has to be recognised that there are inherent trade-offs between costs, complexities and public participation Gough et al. (2008), these have to be acknowledged and incorporated in a third party certification design system, especially when designing SD indicators and frameworks.

The theoretical framework for the development of effective and accepted indicators calls for a bottom-up approach (Reed et al., 2006; Doody et al., 2009). The practicalities, in terms of feasibility, cost (both financial and time) and efficiency of this approach have to be fully considered. While the top-down approach to indicator development is not the ideal way of achieving ‘true’ SD, its utility must not be discounted. Top-down indicator development has its place alongside a bottom-up approach and an expert, knowledge driven, practical approach to selecting relevant indicators has as much of role to play in the overall process as those of a

bottom-up approach to developing and conceptualising SD and SD indicators. There is a call from Mascarenhas et al. (2010) for the use of a mixed approach to SD indicator development. While the FSC and MSC have incorporated and embraced the concept of regionally or project-specific indicators, they have all relied on a top-down approach to achieve this. While in practical terms this approach is more feasible, it does not recognise the differing perspectives of all stakeholders that are vital to effective SD operationalization. Mascarenhas et al. (2010) details a methodology that utilises a knowledge, science-led approach to selecting and synthesising a broad list of criteria into a single list. Then from this a bottom-up approach is used to refine and choose the indicators to be used in a particular region or project. This process has not been widely adopted in current third party certification standards and proposes a new and unique step in the development of SD indicators for new certification standards, such as the proposed voluntary carbon standard within this thesis.

4.5. Developing SD Indicator Guidelines for a Voluntary Carbon Standard

All the certification standards, as discussed above, apply different principles, criteria and indicators to assess the environmental management practices of a specific type of project. This is no different in terms of a voluntary carbon standard and SD. These need to be taken into account in the development of indicator guidelines for carbon certification. These will then help guide the development of future voluntary carbon standard SD indicators.

As has been discussed earlier in this chapter, the literature on indicator development details varying extensive, broad criteria lists (Bell and Morse, 2003; Rees et al., 2006; Rees et al., 2008) that are designed to guide and assist in the development of new indicators. However in the case of the of certification systems, indicators are used in a different way to those highly analysed in the current literature, e.g. indicators for monitoring purposes. Current SD indicator literature has focused more on the development of normative indicators that are classified as either prescriptive or evaluative indicators (Rempel et al., 2004; Heink and Kowarik, 2010) and are used to monitor future conditions of systems and the impacts of projects on the systems respectively. Current use of indicators, in certification standards, do not explicitly fall into either of these two normative categories, rather they aim to interpret and evaluate the current SD credentials of proposed or existing projects, as well as serving to guide projects in the development phase as to what they need to incorporate into the project to obtain certification. Certification SD indicators therefore exhibit a multi-purpose function and should be classified as descriptive indicators according to Heink and Kowarik (2010).

This defining an appropriate SD indicator, specifically for certification systems, also calls for the need to questions what constitutes an effective SD descriptive indicator. This list summarises the characteristics needed to develop an effective descriptive indicator, developed for this thesis from the literature, specifically to guide the development of SD indicators for the proposed voluntary certification standard:

- Descriptive (synthesise data for a specific sector)
- Accurate and Reliable (reliable data available on a regular basis)
- Multi-purpose (measure current levels of, and provides guidance towards, SD)
- Trans-disciplinary (quantitative or qualitative indicators integrating a variety of disciplines)
- Representative of stakeholders (relevant to their specific needs and desires)
- Efficient (cost-effective, time scales)
- Practical (data collection and monitoring)
- Applicable to a variety of spatial scales (regional and local)
- Straight forward (easy to understand, interpret and communicate)

This list differs from existing indicator development lists as carbon certification is not involved in using indicators purely for monitoring purposes, this is stressed in their multi-purpose nature of both guidance and monitoring. This requires a different emphasis to the formulation of descriptive indicators as they are not explicitly required to measure change of actions, rather they are designed to measure the final outcomes of projects. This highlights the need for the emphasis on a trans-disciplinary approach of utilising both quantitative and qualitative measurements from a variety of disciplines (economics, social and environmental), ensuring the practicality of indicators to project developers and ensuring stakeholder involvement in their development. Abiding by these guidelines will serve to ensure that SD indicators incorporated into certification systems serve to achieve the desired outcomes of both indicators and certification.

4.6. Discussion and Conclusion

It has to be recognised that there are trade-offs between any activities of a project and its impact on the environment, with the main aim of certification being to ensure that the adverse impacts are identified, limited and/or mitigated. It is for this reason that even the most stringent certification standards will never guarantee that a utilised and managed natural

resource is equal to an untouched one (Agnew et al., 2006; van Kuijk et al., 2009).. The development of SD indicators has emerged amongst all the certification sectors as a vital first step of ‘doing’ sustainable development.

The FSC, MSC and ISO 14000 are just some of the certification standards that have adopted varying forms of SD indicators. These programs all share the same broad end goal of ensuring that sustainable development consideration are incorporated into the sector that they aim to guide. However the process of developing the applicable SD indicators has not been without its controversies and debates and has become a highly political issue. It prevails around the use of a top-down or bottom-up approach to developing and selecting the appropriate indicators for the SD objectives. The arguments centre on the feasibility of a purely bottom-up approach and the true SD benefits of a top-down approach. Large amounts of criticism have been directed at the use of multiple, differing third party auditors in each system. This adds large amounts of subjectivity and perverse incentives encourage certifiers to be more lenient in the verification process. This has introduced a degree of distrust throughout the certification industry and reduced the effectiveness of voluntary environmental standards.

Nasi and Frost (2009) highlight that certification, using indicators, cannot be used as a definitive measure to ensure sustainable development; rather it has to be viewed as a vital step and tool towards achieving the management of natural resources. The use of reliable and easy to understand indicators can go a long way to increasing the legitimacy and acceptance of certification standards and VEPs, for both the potential project investors and consumers of the products generated from the projects. To achieve a holistic goal of sustainable development, indicators are only just one part of the equation. To be truly effective, the outcomes of certification have to be coupled with viable incentives through either positive economic gains for projects that obtain certification or through government regulation or taxation that penalises projects who do not abide by the standards. This will encourage a move towards the increased acceptance and development of new VEPs and eco-certification schemes that move towards the acceptance and incorporation of SD goals in a wide variety of goods, services or projects.

This analysis of SD indicator development and the FSC, MSC and ISO 14000 certification processes has offered a variety of lessons to be learnt from the existing voluntary environmental standards:

- The development of SD indicators for certification schemes is a viable way of operationalizing SD, but the indicator frameworks and implementation needs to be refined.
- Developing indicators specifically for certification schemes needs to move away from the traditional approach to indicator development and focus on the development of descriptive indicators.
- The development of SD indicators for certification needs to incorporate both a top-down and bottom-up approach and recognise the inherent trade-off between public participation, costs and complexities, especially in developing countries.
- Third party certification needs to be reviewed and altered to ensure that projects are evaluated consistently and fairly, this will install trust into the certification standard.

Coupling the lessons learnt from this analysis with those gathered from the previous analysis of the current voluntary carbon standards will greatly aid in the development of a South African voluntary carbon standard. All this information from both analyses (Chapters 2, 3 and 4) needs to and will be consolidated and put towards the development of this standard. While it might not borrow directly from all the standards reviewed, their historical development will guide the new standard. This chapter has identified the pitfalls that need to be avoided and the positives that need to be incorporated, refined and enhanced, especially surrounding voluntary certification and SD consideration. As the voluntary carbon market is a constantly and rapidly developing market there is large scope for innovation and these lessons from past certification schemes will contribute to the development of new ideas and techniques for the South African voluntary carbon standard.

Part 2:

Development of a Preliminary Voluntary Carbon Standard for South African
Landscape Restoration Projects

CHAPTER 5:

The Development of a Standard Specific SD Indicator
Framework

5.1. Introduction

5.1.1. Purpose of Chapter

This chapter aims to address the part of the vision (Chapter 1) relating to the emphasis of the proposed South African voluntary carbon standard to actively contribute to ensuring the sustainable development credentials with a particular emphasis on addressing South Africa's developmental challenges. It has to be noted that the details and suggestions contained within this chapter are nowhere near ready for practical application or use, nor is the content within this chapter designed to be a final product. It has to be made clear that this chapter does not set out to address any of the carbon quantification aspects of a project, as they are addressed in Chapter 6.

5.1.2. Sustainable Development and Co-benefits

It is becoming increasingly recognised that carbon offsetting projects, in different forms, have the potential to achieve a lot more than purely carbon offsetting but they can contribute significantly to achieving SD. Whether this is through providing increased employment opportunities to restoring landscapes and catchments or increasing ecosystem functioning and biodiversity conservation. The market also offers the opportunity to promote the inclusion of sustainable development benefits into offsetting projects. It offers an avenue to utilise existing financial market structures to engage with and unlock potential funding for offsetting projects with explicit sustainable development benefits. Voluntary carbon standards are seen as a 'market-making' intermediary in a market that currently has no recognised form of regulation. It is within this role that they play the crucial role of defining the norms, value and beliefs that ensure the functioning of the market (Merger and Pistorius, 2011). This is imperative as all land-based projects are situated within complex socio-economic and ecological systems and it is essential that they address and incorporate these prevailing social and environmental issues (Merger and Pistorius, 2011). This is crucial to reduce the risks associated with a project and to gain acceptance and involvement of local stakeholders. Voluntary carbon standards have the potential to instil and ensure sustainable development within the market, through making it a market norm and value for both project developers and purchasers. This can both enhance both a project's legitimacy and credibility but also reduce the immediate and long term risks associated with a project.

As discussed in Chapter 4, a crucial issue in this has become the process and frameworks that voluntary carbon standards use to evaluate, incorporate and ensure that projects are contributing to sustainable development within the region they are situated. The process used to evaluate sustainable development objectives during the certification process is paramount in ensuring that they are effectively incorporated, monitored and reported on. It has to be recognised that a project can produce both positive and negative externalities. Co-benefits have been described as the positive externalities that arise from the successful implementation of an offset project, while the negative externalities have often been described as co-costs. A certification standards sustainable development evaluation framework has to take into cognisance both of these potential outcomes and explicitly identify, incorporate, evaluate and monitor them to create a picture of a project's SD credentials.

It has to be recognised that there are extra costs and complexity associated with attempting to incorporate SD characteristics and evaluation into the project design process (Gough et al., 2008). In a competitive environment, with differing voluntary certification standards (Chapter 3) competing with each other to verify the most offsets, there needs to be an incentive for a project to choose the path of attempting to obtain certification with an added sustainable development component. Currently the majority of projects are going the route of pure carbon certification through VCS, but there is a steady increase in recognition of offsets with a certified sustainable development component. As the voluntary carbon market offset purchases are currently driven predominantly by corporate social investment purchases, corporates are realising the marketing and ethical incentives that arise from purchasing offsets with added sustainable development benefits. This has caused projects that have obtained both VCS and CCBS certification receiving between 1 and 2 US\$ more per offset, purely as a result of the co-benefits that can be verified, monitored and reported from the project (Neef et al., 2010).

This has begun to gain more prominence throughout the voluntary markets as evaluating, monitoring and reporting allows the market to place a value on these SD benefits and as a result they can therefore effectively internalise and place a value on the externality. This has led to the process of 'bundling' the sale ecosystem services and has allowed for a higher price to be charged on an offset generated from a project that is certified by a standard that incorporates a SD evaluation framework that aims to measure and report on these ecosystem

services. This is evident in that in 2010 many of the offsets generated from voluntary carbon standards that explicitly incorporate co-benefits in the certification process (CarbonFix, GS and Plan Vivo) attained a higher average price than the average over-the-counter price in 2010 (Peters-Stanley et al., 2011). While the market share of these standards is still relatively small the growth potential of projects that have social and environmental appeal is beginning to come to the fore. The GS and Plan Vivo transacted increased volumes in 2010, while CCBS continued to establish itself as the most sought after project design standard in the market (Peters-Stanley et al., 2011).

5.1.3. Voluntary Carbon Certification, LULUCF and SD Indicator Frameworks

Currently the voluntary standards that incorporate SD evaluations utilise a differing framework, or a combination of various frameworks, for reporting on the SD benefits of the particular context in which they are situated. It has to be recognised that differing project types have the potential to contribute differing amounts of SD benefits and that this needs to be incorporated into the various certification designs. It is however becoming increasingly documented and recognised that LULUCF projects have the potential to contribute to and ensure high levels of co-benefits (Peskest et al., 2007). This has seen project specific sustainable development indicator frameworks being mainly included in standards that focus predominantly on LULUCF type projects, such as CCBS, CarbonFix, SC, and Plan Vivo.

Standards have chosen to design their SD indicator reporting guidelines around both recognised SD frameworks in the literature (e.g. SC utilises the Sustainable Livelihoods Framework) or designing their own from expert input during the certification standard design phase (e.g. CCBS). This has led to the incorporation of differing aspects of sustainable development within standards. The relatively new development of country specific or embedded standards, such as Brazil Mata Viva and Chinas PS, has also led to the development of new adaptation country specific sustainable development assessment and evaluation methodologies and frameworks. These standards can only be used by projects situated within the specific host country and the co-benefits and SD indicators are therefore adapted to addressing the inherent developmental challenges of the specific host country (Peters-Stanley et al., 2011). This has allowed a standard to become a lot more focussed and relevant to ensuring the sustainability of projects developed within a specific country.

5.2. The SD indicator Framework Development Process

The discussion of SD indicator frameworks in Chapter 4 is vital to the development of an effective and efficient SD indicator evaluation methodology for a voluntary certification standard. The lessons learnt from this discussion emphasise the development of an SD indicator framework that is applicable in the context it is situated. This is reinforced by Gough et al. (2008) which identified that it is imperative to define and develop a detailed, multi-scale, standardised list of indicators that can be used to guide the selection and development of more project-specific indicators that take cognisance of the context in which they are situated. This allows projects to achieve a higher level of autonomy and assessment of the true sustainable development benefits generated from a project.

The incorporation of sustainable development is a vital component of the proposed South African voluntary carbon standard (see Box 1.1). This voluntary carbon standard system aims to be one of the few worldwide that explicitly evaluates, monitors and reports on the sustainable development credentials of a carbon offset project. However it is recognised that this process brings with it extra complexity and costs for the standard development process and both project developers and certifiers. It is envisioned that the development of a South African specific, common sustainable development indicator framework that can be used across all projects will go a long way to addressing these issues and minimising the associated costs.

To initiate the process of SD indicator identification for this thesis, a workshop with experts was held to fulfil the top-down process as suggested by Mascharenas et al. (2010). The overall aim of the workshop was to identify a wide range of indicators that are relevant, feasible and that can be practically applied at a landscape restoration project level taking cognisance of the South African developmental context. These are essential as this standard aims to move beyond pure carbon certification to one that places SD at the same level as carbon.

5.2.1. Aims and Objectives of the Workshop

Developing indicators that are uniquely positioned within a South African context and designed surrounding South Africa's developmental challenges is essential to the success and practicality of the standardised SD indicator list.

To achieve this, the specific objectives of the workshop were to:

- Review and develop a framework for SD indicators selection.
- Identify key and South African specific indicators that can be used to assess the SD criteria of landscape restoration projects within South Africa.
- Develop an inventory and standardised list of SD indicators that can be used for South African landscape restoration projects.

5.2.2. Workshop Process

Over twenty experts were identified with knowledge of South Africa's socio-economic situation, carbon markets and landscape restoration processes. They were selected based on their experience and expertise based on the above criteria, and it has to be noted that experts invited were from or based within South Africa, and where possible Grahamstown, due to time and budget constraints. They were invited to attend the workshop to be held in Grahamstown, South Africa. These experts were from a diverse range of fields including forestry, landscape restoration, biodiversity, economics, water, carbon offsets and social sciences and comprised of academics, practitioners and researchers. They were challenged to identify and critically analyse the key sustainable development challenges within the context of South Africa and in particular those that landscape restoration projects face and can contribute to addressing. These were then used to guide the selection of the SD indicators that can be applied to these projects.

The workshop consisted of a presentation and discussion section and a breakout session. In the presentation experts were presented with more detail about the proposed project and its overall aims and principles and the hoped for workshop outcomes discussed above. Experts were also allowed to question and debate about the workshop structure and content so as to allow for a more conducive process to reach outcomes of the workshop. The presentation session also allowed for debate and the identification of the guiding, broad sustainability themes that were needed for the breakout sessions. Figure 5.1 outlines the process followed to achieve the workshop results.

5.2.3. Identification of SD Themes and Sub-Themes

It was agreed that the three pillars of sustainability as outlined in the Brundtland Report (United Nations, 1987) were a well-recognised starting point for the discussions around SD and the identification of crucial sub-themes that could be used to guide the development of

indicators. It was however accepted at the workshop that the social and economic categories, in this context could be joined, to form the socio-economic theme (Figure 5.1). These two categories then set the overall themes for each discussion group and experts were asked to participate within the group that they felt they could contribute the most too.

In the breakout session, experts were challenged to consider and debate the South African specific challenges within their broad themes and from this identify a number of more focused sub-themes. These sub-themes were then used to focus the selection of the indicators that can be used to evaluate these sub-themes. The development of the sub-themes allowed for the focussing of the indicator selection process on the areas that the experts identified as being essential. This then allowed for identification of specific indicators that could be fed into the development of the SD indicator framework.

Experts were guided and assisted in capturing the proposed indicator through being required identify and classify indicators in three distinct groupings: 1) essential to have – indicators that are non-negotiable and critical for the assessment of SD; 2) desirable to have – indicators that would be nice to have and add to enhancing the SD assessment of a project, and 3) love to have – indicators that would be ideal to include to ensure the maximum assessment of SD credentials.

This process allowed the participants to highlight the crucial indicators within each theme and categorise them according to ‘importance to have’. To assist in identifying and grouping these indicators, the experts were guided by the following questions:

- Why measure it – the purpose and rational of the indicator.
- Strengths and limitations – how useful overall and what problems may occur in using the proposed indicator.
- Are they feasible to implement - data, costs, time etc.
- How are the data collected - method and approach used to collect the information.
- How are they measured, reported and communicated.

The experts identified twelve crucial sub-themes that they believed need to be addressed that would ensure the SD assessment of a landscape restoration project. These were then presented to the group as a whole for additional comment, debate and input.

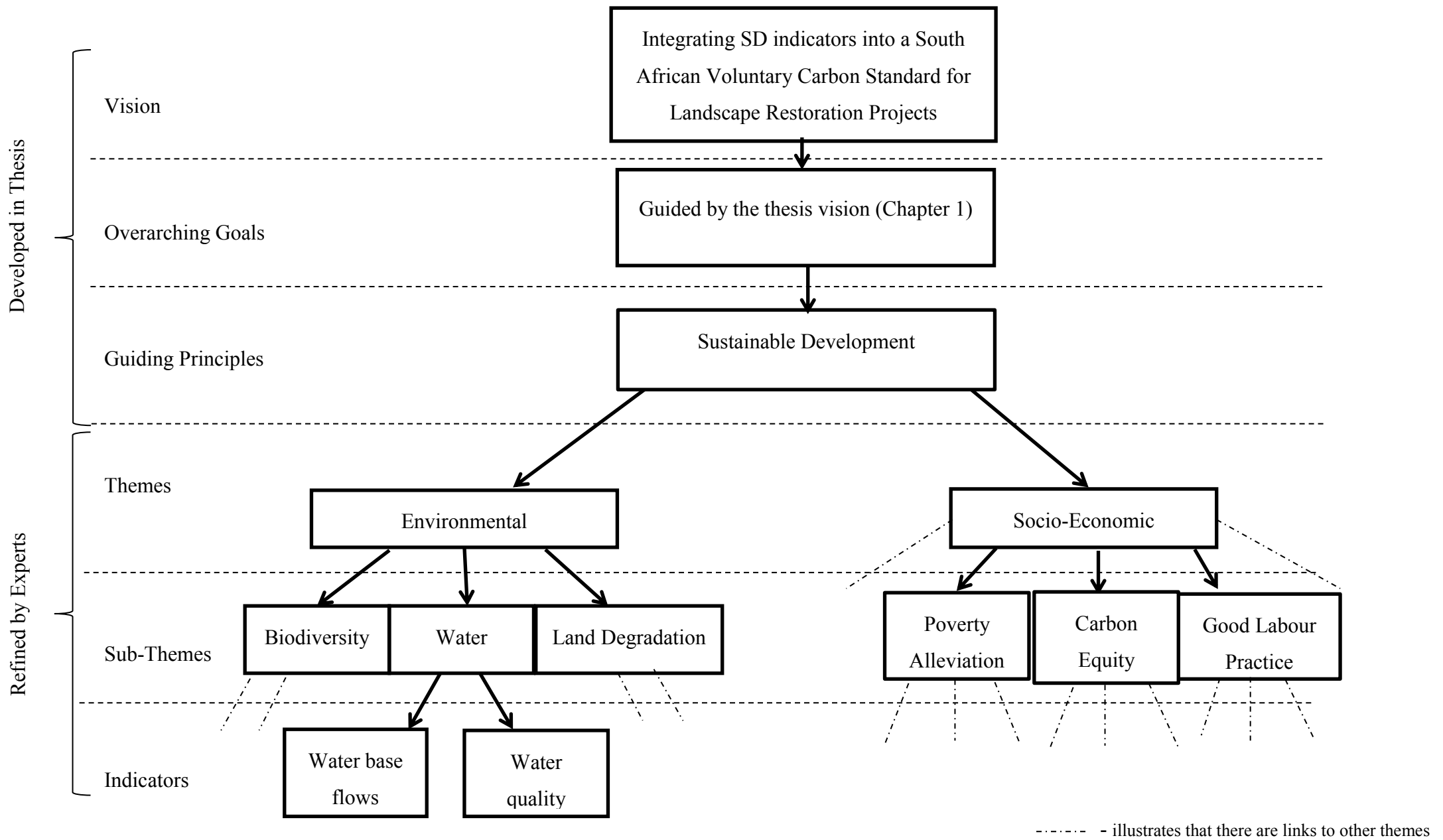


Figure 5.1: Workshop process followed to identify the broad list of SD indicators

5.3 Workshop Outcomes

This process allowed for the identification of the initial broad suite of SD indicators within each theme for landscape restoration projects within South Africa. The experts identified 44 indicators in the 12 sub themes (Table 5.1. – 5.4). It is these identified sub-themes and indicators that constitute the initial broad standard-specific indicator list as suggested by Mascharenas et al. (2010).

5.3.1. Fitting Indicators into South Africa's SD Challenges

To understand the challenges that a South African voluntary carbon standard faces in ensuring that carbon offsetting projects contribute to SD, it is imperative to understand the broad context and challenges in which the standard will be situated. South Africa has been through a well-documented, turbulent history and faces vast and complex socio-economic and environmental challenges to development and in improving the well-being of the entire population. The environmental and socio-economic developmental challenges that South Africa faces are explicitly interlinked and addressing each of these is vital to encouraging sustainable development within the country.

5.3.1a. Environmental Challenges

The South African State of the Environment Report (SoER) (Department of Environmental Affairs and Tourism, 2006) provides an extensive overview of the current conditions of South Africa's environment. It identified a number of major environmental challenges and priorities that South Africa faces and central to these are the identified sub-themes of water; biodiversity and land degradation issues.

i. Water

South Africa is a semi-arid, water-stressed country and access to fresh, quality water for agriculture, industry and human use is one of the key limits to development. South African has historically been plagued with both water availability and quality issues and since 1994 and South Africa has steadily had less water available and that which is of a poorer quality (Department of Environmental Affairs and Tourism, 2006). However, the use of the available fresh water resources from both rivers and aquifers has been steadily increasing with a concurrent result in decreased freshwater flows into river systems. Water quality has also been steadily decreasing due to inadequate controls over pollution and the current land use

practices. Coupling these two facts together has led to an overall decline in the health of South Africa’s river ecosystems. The sustainability of water resources, its quality and availability it depends on the improvement of land management practices within catchments (Mander et al., 2010).

Water Indicators

Specific issues surrounding water have been largely neglected in current voluntary carbon standards. While they have been included and acknowledged at a broad level within standards focused at LULUCF projects such as the CCBS and CarbonFix, they have not included explicit indicators relating to the effect of landscape restoration on the availability and quality of water resources. Since water is a crucial issue within South Africa, its availability and quality needs to be explicitly monitored and accounted for in projects that fundamentally affect land-use within catchments. The experts identified six key indicators that could be assessed and reported on that specifically relate to water and land-use issues within South Africa. Table 5.1 below documents these.

Table 5.1: Water Indicators

Sub Themes	Indicator	How to measure
Water	Rainfall Levels	Proof that there is a plan, equipment and methodology for monitoring annual rainfall levels.
	Seasonal Streams	Measure the change in water base flow levels using a recognised method on seasonal stream flows (e.g. Arnold and Allen, 2007).
	Ground Water Levels	Record and report groundwater levels using a recognised method (e.g Pickens et al., 1978).
	Infiltration Rates	Report on infiltration rates in permanent plots using a recognised method (e.g Pickens et al., 1978).
	Wetlands	Record and monitor all wetlands within the project area using the WET Health assessment system according to Macfarlane et al. (2008).
	Water Quality	Measure and record river quality within project area according to SASS guidelines according to Dickens and Graham (2002).

As can be seen these indicators focus on the pertinent aspects of a wide variety of water related issues. These extend from indicators that have to be used to provide contextual information, in particular measuring and reporting on rainfall levels to those that need to be actively monitored and reported on, such as infiltration rates, ground water levels and water quality. Where possible the suitable, rapid assessment methodologies are dictated, such as that of WET-Health for wetland assessment (Macfarlane et al., 2008) and SASS guidelines for water quality (Dickens and Graham, 2002).

ii. Biodiversity

Due to South Africa's rich diversity of plants, animals and ecosystems it has one of the highest levels of biodiversity in the world. South Africa contains three globally recognised biodiversity hotspots: the Cape Floristic Region (CFR), Succulent Karoo and the Maputaland-Pondoland-Albany Hotspot, MPAH (Mittermeier et al., 2011). The South African SoER (Department of Environmental Affairs and Tourism, 2006) states that the general condition of South Africa's biodiversity and ecosystem functioning is 'not good'. Increasing human pressures in areas of high biodiversity are leading to a rapid decrease and loss of species and the resultant decline of ecosystem functioning.

Of all South Africa's natural systems the aquatic ecosystems are experiencing the greatest threats. There is a particular risk to the destruction and conversion of wetlands. Terrestrial biodiversity is also under threat with areas of high biodiversity situated in areas with high levels of human pressure, as a result widespread land degradation is leading to loss of ecosystem functioning and in turn reducing the productivity of the land.

Another major pressure relating to the loss of biodiversity within South Africa is the rapid rates of spread of alien invasive species (AIPs). They are leading to the loss of biodiversity and ecosystem functioning with the reduction of stream flow in rivers a key aspect. There are currently 198 plants classified as being invasive and it is estimated that they cover about 10% of the country (van Wilgen and De Lange, 2011).

Biodiversity Indicators

Biodiversity indicators have been well investigated, covered and incorporated into current LULUCF voluntary carbon standards, such as the CCBS, and in the majority of standards

they act as a cornerstone of assessing the environmental sustainability credentials of a project. However, to encompass a broad swathe of projects in differing locations they offer more guidelines and requirements to assessing biodiversity than specific, implementable indicators. They allow for projects to select their own assessment methodologies and reporting guidelines and thus these are not standardised across projects, making accurate comparisons and third party assessment between projects more challenging. Biodiversity is however a highly complex and the multi-dimensional aspects of measuring and conducting full biodiversity assessments of a given area are highly time consuming and expensive. Therefore to obtain an indication of biodiversity within an area, the current standards utilise a number of proxy measures, but it should be noted that these will never be able to truly account for the entire extent of biodiversity.

Accordingly to overcome these challenges the experts identified a number of biodiversity proxy indicators, both qualitative and quantitative, that can be used to assess the potential biodiversity benefits from a project. These include proxy indicators of biodiversity through changes in vegetation cover and species richness (in particular plants). Other, simpler to report, proxy indicators require that projects show if they are situated within a biodiversity hotspot, and therefore contribute to restoring habitat of a vital ecosystem or that they list all the endemic species within the project area. Table 5.2 below details the proxy indicators identified by the experts:

Table 5.2: Biodiversity Indicators

Sub Themes	Indicator	How to measure
Biodiversity	Vegetation Cover	Measure levels of vegetation cover within the project area using an appropriate method, such as aerial photos.
	Species Richness	Measure and report all plant species in a sample of permanent, fixed plots over the lifespan of the project.
	Alien Invasive Plants	<ul style="list-style-type: none"> Report on the extent, density and species of all AIPs within the project area. Project has to have evidence of a clear AIP removal and control plan.
	Biodiversity Hotspot	Detail if project is situated in a biodiversity hotspot.
	Endemic Species	Describe all endemic or endangered species present in the project area.

iii. Land Degradation

The 2004 National Action Plan to Combat Land Degradation and Alleviate Poverty recognises the need to reverse land degradation in South Africa to both improve livelihoods and protect biodiversity (DEAT, 2004). Land degradation is seen to be severe in communal and rural areas as this is in conjunction with the total densities of livestock in South Africa which exceeds the lands long term grazing capacity (DEAT, 2006).

The intensification of land-use and farming has led to increased localised effects in biodiversity loss and decreased water quality from increased sedimentation in the river systems. It is estimated that soil degradation cost South Africa nearly R2 billion annually, purely in dam sedimentation and increased water treatment costs (DEAT, 2006).

Land Degradation Indicators

Land degradation has an adverse effect on water, biodiversity, as well as high costs and decreases the productivity of the land on which the project is situated. Land degradation, despite being a major environmental issue, has also been neglected in current LULUCF voluntary carbon standards. There has been much work done surrounding rapid assessments of land degradation and function over time, especially that of Tongway and Hindley (2004) and through utilising these existing methodologies a project can adequately assess its role in addressing land degradation. Table 4.3 below shows the indicators that the experts identified.

Table 5.3: Land Degradation Indicators

Sub Themes	Indicator	How to measure
Land Degradation	Bare Soil Cover	Report on % of bare soil cover in project area, relative to the functioning ecosystem.
	Land Degradation Index	Rapid assessment of land degradation using a recognised and suitable methodology (e.g. Tongway and Hindley, 2004)

5.3.1b. Environmental Indicators Discussion

These indicators cannot be seen in isolation of sub-themes or individual indicators; they have to be seen as a collective and applied to assess the environmental sustainability of a

particular project. In some instances they extend across themes and overlap, e.g. the assessment of AIPs has both a role to play in biodiversity and water issues, while calculating a land degradation index includes aspects of infiltration and vegetation cover.

It has to be recognised that due to the complexity and challenges associated with accurately assessing environmental sustainability, ecosystem functioning and biodiversity there are inherent trade-offs between extent and depth and costs, expertise and time. These indicators aim to act as rapid assessment proxies that focus project development on addressing and implementing actions that ensure the net positive environmental benefits of a project. Reporting on and assessing these indicators will however allow for projects to go a long way to proving their contributions to environmental sustainability.

These indicators while focussed at contributing to SD, they also implicitly focus on the assessment and monitoring of vital ecosystem services that are associated with a landscape restoration project. This is implicit in the SD assessment process as restoring the functioning of ecosystem services through landscape restoration will ensure the environmental integrity, and hence SD, of projects. This will also have the benefits of allowing for the reporting of a project's contribution to restoring ecosystem functioning and capitalise on a form of bundling and selling of ecosystem services, albeit with carbon as the lead commodity.

5.3.2a. Socio-economic challenges

South Africa faces many challenges to socio-economic development, from high levels of unemployment and poverty to historical barriers and economic exclusion of vast sectors of the population (Leibbrandt et al., 2010). These challenges are well documented and while there is no quick fix there needs to be steps taken to redress the imbalances and ensure that all South Africans have the opportunity to benefit from new economic opportunities. The overarching South African socio-economic sub-themes identified by the experts in this workshop are consistent with those identified by Bhorat and Kanbur (2005), but tailored towards a carbon offset project development. The experts identified nine important socio-economic sub-themes: poverty alleviation; good labour practice; gender equity; carbon equity; social capital; value chains; policy and practices; income and benefits; and infrastructure and services development.

A large proportion of South Africans live in poverty. It is widespread amongst all geographic locations but concentrated mainly in rural areas amongst the majority black population

(Leibbrandt et al., 2010). In 2008, 48% of the South Africa people were living below the poverty line of US\$2 per day (National Planning Commission, 2011). It is estimated that 70% of these people live in rural areas (Shackleton et al., 2010). A direct contributor to this is South Africa's high levels of unemployment, with government statistics for the 2nd quarter of 2011 highlighting an unemployment rate of 25.7% (Statistics South Africa, 2011) but with real unemployment rates around 40% (Davies and Thurlow, 2010). Within this the women and youth are highly affected with only one third of youth under the age of 35 currently employed and women also vastly under-represented with them contributing only 34% of the economically active population (Bezuidenhout et al., 2008).

These high levels of unemployment and equity issues underpin and compound the widespread poverty within South Africa, especially within rural communities (National Planning Commission, 2011). Leibbrandt et al. (2010) reinforce this and highlight that the rising inequality in South African is both due to the rising rate of unemployment and rising earnings inequality amongst the South African population. It is these characteristics that have prevented the labour market from playing a positive role in poverty alleviation. For the South African labour market to contribute to poverty alleviation there needs to be the creation of long term, equitable and stable employment for those living in poverty.

The cycle of poverty described above is being further exacerbated by the widespread prevalence of HIV/AIDS which contributes stressors and shocks to already impoverished individuals or households. South Africa has one of the highest prevalence of HIV/AIDS in the world, with 10.5% of the total population living with HIV (Statistics South Africa, 2011). Aliber (2003) states that the HIV/AIDS pandemic is expected to contribute to the impoverishment of 26-33% more households that would have been the case without the disease.

i. Socio – economic Indicators

The combination of the social and economic themes led to the development of nine sub-themes that were identified as being crucial to addressing the myriad of developmental challenges that South Africa faces. It has to be recognised though that a carbon offsetting project cannot address all the embedded social issues within South Africa, but it can contribute to increasing the well-being of those employed by the project and contribute to sustainable livelihoods of communities surrounding the project. As a result the indicators

identified by the experts predominantly focus on those social and economic issues that a project can have direct influence or control over.

In recognising this, the experts identified 31 indicators that could address and evaluate a project's socio-economic sustainability credentials. These covered a wide range of socio-economic issues from poverty alleviation to gender equity and infrastructure and services development. Table 5.4 highlights the socio-economic indicators identified by the experts at the workshop that could go some way to contributing to addressing the challenges identified.

Table 5.4: Socio – Economic Indicators

Sub Themes	Indicator	How to measure
Poverty Alleviation	Poverty Alleviation Potential	Is the project situated in an area of high poverty?
	Number of Employees and cumulative working days (annually for the project)	Record of number of employees and their cumulative working days, permanent and contract, employed by the project.
	Local Employment	Majority of people employed from the area surrounding the project.
	Skilled vs. Unskilled Labour	Detail the ratio between skilled and unskilled labour employed by the project.
	Employee Education and Training	Evidence of a plan for employee skills development and training and a professional development plan coordinated to employee needs.
	Health Awareness	Evidence of programmes and plans that raise awareness and provide guidance for employees around health issues e.g. HIV/AIDS awareness
	Employee Dependents	Number of dependents supported by the employee's income.
Good Labour Practice	Employment Status	Detail the ratio between contract and permanent employees.
	Employment Turnover	Percentage of employee turnover every year. Evidence of employee dismissal procedures and reasons for dismissal
	Health and Safety	Evidence of a plan that deals with health and safety issues and training with regards to employees of the project.
	Dispute Resolution	Evidence of a plan that adequately outlines dispute and grievance procedures for employees of the project.
	Child Labour	Evidence must be given that no children under the legal working age are employed by the project
Employment Equity	Equal Employment Opportunities	Evidence of a recruitment plan that offers equal opportunity for employment
	Gender Employment Ratios	Detail the ratio of male and female employees.
	Equal Compensation Rate	Equal compensation and benefits for male and females at same pay grade.
	Youth and Women Employed	Evidence of the ratio of youth (below 35) and women employed as compared to men.

Carbon Equity	Establishment of Community Upliftment Trust Fund	Evidence that project contributes to uplifting communities through a fund that invests in development (education, health, housing).and that any investments are aligned to community needs and wants.
	Access to Natural Resources	Proof that communities surrounding the project have not been involuntarily excluded from using or access to the use of traditional sources of natural resources.
Social Capital	Forming New Networks	Assess the extent of new networks and benefits gained or formed between or among managers, employees, everyone else affiliated with the project using an appropriate methodology.
	Employees (or Community) Representative Council	Encouragement and assistance for workers to discuss issues in a formal setting. Elected representative that is involved in project strategic meetings.
Value Chains	Income Distribution and Capital Sourcing	Disclosure of company shareholders and nationalities and the percentage of profits distribution to shareholders.
	BBBEE Compliance	Projects have to disclose BBBEE compliance and partners.
Policy and Practices	Local Based Suppliers	Policy to purchase from locally based suppliers where possible.
	Local Labour and Management	Policy and plan to employ local labour and management where possible.
	Income Diversification Plan	Show planning steps or a strategic plan for a future income diversification plan for the project.
Income and Benefits	Project Wage Rate	Compare average project wage rate to the legislated minimum wage.
	Remuneration Proportion	Proportion of profits spent on remuneration between managers and employees.
	Income Contributed to Employee Benefits	Costs spent on housing, education, healthcare for employees.
	Income Distribution	Wages paid to contract and permanent workforce.
Infrastructure and Services Development	Infrastructure and Basic Services Spending	Disclosure of spending on infrastructure development and basic services improvement for both employees and the project, and what this has been.
	Access to Infrastructure	Who has access to the improved infrastructure?

5.3.2b. Socio-economic Indicators Discussion

Social and economic indicators within current voluntary carbon standards are addressed and integrated in a variety of different ways, while the CCBS does not prescribe any specific indicators or areas that need to be assessed it does dictate that projects include and report on a recognised and consistent method of social assessment. SC on the other hand uses the Sustainable Livelihoods Framework (SocialCarbon, 2003) as a structure to guide the inclusion of specific indicators that projects need to monitor and evaluate in a participatory manner as dictated by the standard. CarbonFix highlights some standard specific issues while also borrowing from other voluntary standards such as CCBS and FSC. The majority of assessment methodologies focus predominantly on social issues of a project and the economic issues have often been neglected and side-lined within current voluntary carbon standard SD assessment methodologies. What is clear is that there is no predominant, best practice for assessing both the project specific and broader social and economic impacts of a landscape restoration carbon offsetting project.

There has been little emphasis in voluntary carbon standards on ensuring true local level carbon equity through the explicit incorporation of these considerations into indicator design that aim to influence project level design. Carbon equity involves developing access to carbon markets, involvement in carbon project decision making and the continued use of forest and natural resources for the communities involved in or surrounding the project (Brown and Corbera, 2003). Developing this equitable interaction amongst all stakeholders in carbon offset projects is vital to the development of projects that promote SD benefits. The differing interests of all stakeholders need to be acknowledged and incorporated into carbon projects with a strong emphasis on the generation of co-benefits. Key to promoting carbon equity is the development of robust, trusted cross-scale institutions (Brown and Corbera, 2003). Interests between different groups need to be aligned and the issues of fairness and who benefits from the project and whom is included in development actions are vital to promoting these truly sustainable development objectives.

The experts within the workshop highlighted that more emphasis needs to be placed on requiring projects to assess the pertinent aspects of both social and economic systems, in particular those aspects specifically under the influence of the project. Social indicators identified related mainly to project specific aspects and with a large emphasis on poverty alleviation and meaningful job creation as well as other issues such as health and safety,

gender equity and good labour practice and representation, but also included broader issues such as employee dependents, community upliftment projects and education and training.

Economic indicators focused predominantly on project-specific characteristics such as ensuring a fair wage rate and ensuring that there are relevant policy and plans for locally based employment and suppliers are developed. The incorporation of the social and economic indicators highlight their inherent interconnectedness and places the emphasis on the potential socio-economic impacts that a project can have on the communities that surround it. The use and implementation of the indicators identified are also constrained by the time, costs and expertise needed to collect the relevant data and subsequent analysis of it. It is for this reason that the majority of indicators are related to internal, project related information, such as policy and plans, good labour practice and value chains. This information should be readily available to the project and allow for the ease of reporting and monitoring of these indicators.

A landscape restoration carbon offsetting project does have further reaching and longer term socio-economic effects and impacts than just within the project specific boundaries and amongst those that are employed or active within it. To evaluate the positive, long-term effect a landscape restoration carbon offsetting project can have on its workforce and surrounding communities these factors need to be considered in the design of the appropriate framework.

5.4. Developing a SD framework for a proposed South African Voluntary Carbon Standard

The broad lists of SD indicators identified from the expert workshop (Table 5.1 – 5.4) provide the ideal starting point to develop the initial standard specific SD assessment framework for the purposes of this thesis.

5.4.1. The Input – Output – Outcome – Impact (IOOI) Framework

As discussed in Chapter 4 the development of an appropriate SD framework is essential to the practical operationalization of SD indicators. The IOOI framework is one of these and has been discussed previously. It is widely used by the World Bank and its related organisations, and is the project level development of the common DPSIR framework (Lundberg et al., 2009). This process has also become known as a programme assessment framework (Bowen and Riley, 2003) or a project based framework (Ayres et al., 2010), emphasising its project based nature. Ayres et al. (2010) state that it is a simple, yet, clear and efficient framework that can be used to assess both the immediate, short and long term

impacts of a project. This project based framework is predominantly used to monitor the effectiveness of projects where a major aim is to improve the state of the environment (Ayres et al., 2010). Its effectiveness lies in its ability to differentiate between the direct and indirect impacts of a project, as well as its reliance on project specific characteristics that need to be used to develop the necessary indicators that can then be measured and reported on (Bowen and Riley, 2003).

This framework (Figure 5.2) can be essentially categorised into separate input, output, outcome and impact indicators that follows an implementation plan that flows from influencing the project design phase to the implementation and measurement of sub-themes and projects that contribute towards the desired goals and impacts (Bowen and Riley, 2003). This framework is inherently useful as it allows for indicators to be linked to the project cycle through defining indicators for every stage within it. This allows for the development of indicators that can guide projects and contribute to assessing the project’s performance towards the desired outcomes, in the immediate, short and longer terms.

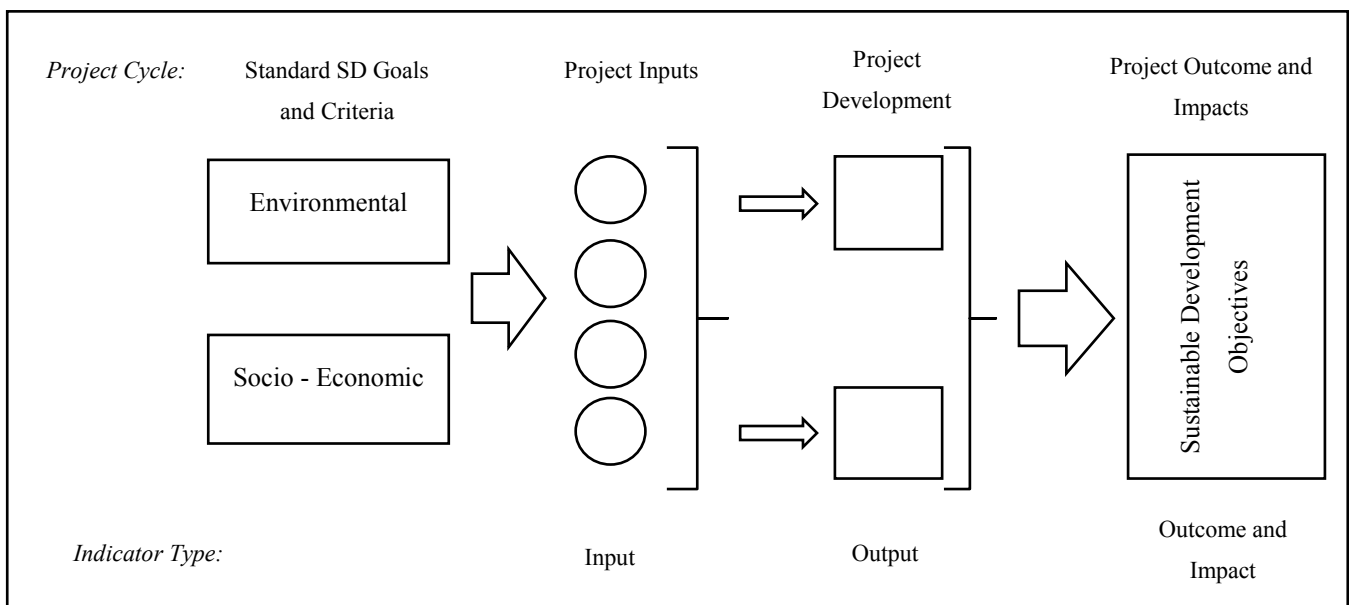


Figure 5.2: The IOOI Framework (adapted from Gambrelli and Bucher, 2002)

There are four crucial steps and indicator types within the IOOI framework (Segnestam, 2002):

- **Input Indicators** – These indicators are designed to obtain the project-specific input data. These data are crucial as it allows for the baseline information to be obtained and the objective judgements about a projects SD characteristics to be made. These

can also offer complimentary information that can then be used to assess the SD contributions of other aspects and indicators.

- Output Indicators – Once a project is implemented there are a number of immediate outputs. These indicators are designed to measure and monitor these effects on the immediate environmental or socio-economic spheres of a project.
- Outcome Indicators – These are designed to measure and monitor the short term outcomes and results of a project. These indicators work in conjunction with the impact indicators.
- Impact Indicators - These indicators are designed to measure the longer term impacts of the project and thus monitoring the projects effectiveness towards achieving its sustainability objectives. These indicators have to be specifically related to the outcome indicators so as to obtain a picture of the indicators contribution to SD of the project.

Input indicators usually take the form of project-specific inputs and can be determined by analysing what specific tasks are to be funded, plans to be implemented, personnel committed and/or the funds earmarked for implementation for a specific purpose. Output indicators then relate to the specific actions that have been taken during the project's design and implementation phase (Gambarelli and Bucher, 2002). The development and formulation of outcome and impact indicators however are more of a challenge. Outcome indicators aim to measure the larger, but shorter term goals, of a project or the state of the environment as a result of the project (Bowen and Riley, 2003). Impact indicators take this further and aim to measure the longer term, broader impact that a project has had on the environment (Gambarelli and Bucher, 2002).

5.4.2. Developing the SD Indicator Assessment Framework

To design an effective and efficient SD evaluation framework it has to be recognised that each action can be measured using this IOOI approach. Accepting this provides an ideal mechanism that can then act as a link between the specific project goals and outcomes with the broader environmental and socio-economic sustainability considerations (Bowen and Riley, 2003). To be truly effective within a voluntary carbon standard process this framework has to be seen as an implementation plan that influences and guides the design of a project type (in this case South African landscape restoration projects) rather than being initially

focussed and tailored to each individual project. Accordingly, the IOOI framework developed for the South African voluntary carbon standard has to be adapted from that of Gambrelli and Bucher (2002). Figure 5.1 highlights this modification of the framework to make it in line with the carbon project development and a certification cycle.

This framework differs in that the proposed standards overarching SD goals and criteria (see Chapter 1 and 6) are used to guide the amounts and types of inputs that a project needs to align themselves with these requirements (Input indicators), rather than the other way around (Gambrelli and Bucher, 2002). This alteration will allow the framework to be applied across a range of project locations within South Africa and provide a uniform process to assess and monitor the SD characteristics of projects. This can then be used to monitor and assess a projects' performance to a positive contribution to SD using the output indicators. Subsequently these are used further to assess a project in both the short (Outcome indicators) and long term (Impact indicators) and their contribution to SD of both their environmental and socio-economic impacts.

5.4.3. Incorporating the Indicators into the Standard Specific IOOI Framework

While the raw indicators and lists were identified at the workshop and are represented in Table 5.1 – 5.4, these needed to be organised and modified to fit into the IOOI framework. To achieve this, the identified indicators were assessed for the applicability in any of the four IOOI categories. Those that were suitable were placed into the relevant category, while those that were not were modified to work within the framework. This involved developing indicators to monitor changes and time scales according to the framework. The initial indicators offered the basis to achieve this and no indicators were altered from their original intent or interpretation. The IOOI framework is presented in Table 5.5 below:

Table 5.5. The proposed IOOI Framework for a South African Voluntary Carbon Standard

SD Theme	SD Sub Themes and Issues	Standard SD Goals	Project Inputs (Input Indicators)	Project Performance (Output Indicators)	Project Outcomes and Impacts	
					Short Term (Outcome Indicators)	Long Term (Impact Indicators)
Environment	<ul style="list-style-type: none"> Issue: Decreased freshwater flows. 	<ul style="list-style-type: none"> Increase Water base flows and quantity. 	<ul style="list-style-type: none"> Technical and financial assistance to measure rainfall and monitor groundwater and seasonal streams. 	<ul style="list-style-type: none"> Detailed and current records and data for rainfall assessment and monitoring. Detailed methodology and plan to measure seasonal streams within the project area Detailed methodology to measure ground water levels within the project area. 	<ul style="list-style-type: none"> % change of seasonal changes in groundwater recharge rate and levels in the project area. % change in seasonal variation in the flow of seasonal streams within project area. 	<ul style="list-style-type: none"> Inter - annular % changes in groundwater recharge rates and levels. Inter - annular % change in water flow within seasonal streams.
	<ul style="list-style-type: none"> Issue: Decrease in water quality. 	<ul style="list-style-type: none"> Increase the quality of water. 	<ul style="list-style-type: none"> Identification of rivers and streams within project boundaries for water quality testing. Investment in SASS practitioners and training. 	<ul style="list-style-type: none"> Baselines for water quality according to SASS guidelines and reporting standards (Dickens and Graham, 2002). * 	<ul style="list-style-type: none"> Annual water quality according to SASS guidelines. 	<ul style="list-style-type: none"> Changes in water quality according to SASS guidelines.
	<ul style="list-style-type: none"> Issue: Decreasing wetland health and functioning. 	<ul style="list-style-type: none"> Protect and monitor wetlands within project area. 	<ul style="list-style-type: none"> Technical and financial assistance to assess and monitor wetlands using WET-Health rapid assessment system (Macfarlane et al, 2008). 	<ul style="list-style-type: none"> Number of wetlands within the project area.* Health status of the wetlands within the project area.* 		<ul style="list-style-type: none"> Change in Wetland status; ensure avoiding a decrease in status.
	<ul style="list-style-type: none"> Issue: Spreading Alien Invasive Plants (AIPs) 	<ul style="list-style-type: none"> Remove AIPs and halt spread within the project area. 	<ul style="list-style-type: none"> Plan to monitor and control AIP species. Number of Full-time equivalent employees (FTE) dedicated to AIP clearing and management. 	<ul style="list-style-type: none"> Total hectares covered by AIPs.* Species and distribution of AIPs within the project area.* 	<ul style="list-style-type: none"> % change in cover of AIPs within project area. 	<ul style="list-style-type: none"> Hectares cleared and used for project activities.
	<ul style="list-style-type: none"> Issue: Biodiversity Loss 	<ul style="list-style-type: none"> Ensure that biodiversity is maintained and natural vegetation restored within the project area. 	<ul style="list-style-type: none"> Technical and financial assistance to assessing and monitoring biodiversity. 	<ul style="list-style-type: none"> Detail if project is situated in a biodiversity hotspot. Identify all endemic and endangered species within the project area. Record the % of vegetation cover within the project area.* 	<ul style="list-style-type: none"> Measure and report on species richness in fixed plots. Annual % change in vegetation cover in project area. 	<ul style="list-style-type: none"> % Change in species richness in the fixed plots.
	<ul style="list-style-type: none"> Issue: Increasing Land Degradation 	<ul style="list-style-type: none"> Halt and reverse land degradation in the project area. 	<ul style="list-style-type: none"> Technical and financial assistance to assessing and monitoring land degradation. 	<ul style="list-style-type: none"> Record the % of bare soil cover in the project area.* Rapid assessment of land degradation index using recognised methodology e.g. (Tongway and Hindley, 2004)* 	<ul style="list-style-type: none"> % change in bare soil cover within the project area. 	<ul style="list-style-type: none"> Change in landscape degradation indicator according to the chosen methodology.
Socio -economic	<ul style="list-style-type: none"> Issue: Poverty Alleviation 	<ul style="list-style-type: none"> Create jobs for the communities surrounding the project. 	<ul style="list-style-type: none"> Indicate if the project situated in an area of high levels of poverty. 	<ul style="list-style-type: none"> Number of employees employed by the project.* % of employees from the communities surrounding the project.* 	<ul style="list-style-type: none"> Cumulative working days for all employees of the project. % of employee turnover each year. Ratio between skilled and unskilled workers. 	<ul style="list-style-type: none"> Number of dependents supported by the employee's income. Change in well-being of employees as a result of the project.
		<ul style="list-style-type: none"> Create decent employment opportunities. 	<ul style="list-style-type: none"> Development of a recruitment plan that offers equal opportunities for employment. 	<ul style="list-style-type: none"> Proof that all employees are of the legal working age. 	<ul style="list-style-type: none"> Ratio between permanent and contract employees. 	
		<ul style="list-style-type: none"> Good labour practice 	<ul style="list-style-type: none"> Development of a plan that outlines dispute and grievance procedures. Development of a plan and financial and technical assistance to employee health and safety. 		<ul style="list-style-type: none"> Number and types of disputes. Number and types of work related injuries. Lost workdays due to injuries or illness. 	<ul style="list-style-type: none"> Reporting on all disputes lodged. Evidence of fair dispute resolution procedures. Evidence that steps are taken to rectify the cause of the injury or illness. % change in dropout rates of employees and reasons why
		<ul style="list-style-type: none"> Skills development, 	<ul style="list-style-type: none"> Technical and financial assistance to 	<ul style="list-style-type: none"> List of programs and plans for employee 	<ul style="list-style-type: none"> Number of employees participating in training 	<ul style="list-style-type: none"> Impact of skills training and

		education and training	develop programmes and plans for employee training and skills development.	training, in particular surrounding personal health awareness. • Proof that plans and programs are aligned to employee needs and wants.	and skills development programmes.	development on employees. • Employee perceptions of the utility of training.
	• Issue: Income and Benefits	• Ensure a fair wage for all employees.	• Proportion of project profit spent on remuneration of project employees.	• Average employee wage as compared to the legislated minimum wage.*	• Proportion of profits spent between managers and employees.	• Changes in savings rates of employees of the project.
Socio -economic	• Issue: Development of Infrastructure and basic services	• Contribute to the development of local level infrastructure and basic services	• Financial and technical costs of developing infrastructure and basic services.	• List of infrastructure and basic services to be developed by the project.	• % of profit allocated to the development and maintenance of the infrastructure developed. • % profit allocated to providing basic services for employees.	• Use and access to of new, developed infrastructure. • Number of households benefiting from increased access to basic services and infrastructure.
	• Issue: Ensure gender equity	• Ensure equal opportunities for all members of the community.	• Development of a recruitment plan that offers equal opportunities for employment.	• Number of male and female employees.*	• Evidence of equal compensation rates at the same pay grade.	• Representativeness of employee workforce as compared to community demographics.
	• Issue: Contribute to the development of carbon equity	• Ensure projects contribute to local level carbon equity.	• Establishment of a community upliftment trust. • Education of employees and the community about the project and its goals and aims.	• Report on members of trust fund management committee. • Records and minutes of meetings.	• Annual contributions to trust fund. • Target areas of trust fund are in line with community needs and wants.	• Trust fund disbursements. • Records of projects funded from trust fund • Knowledge amongst stakeholders about the project and its activities.
		• Ensure access to natural resources	• Plans to manage and control access to natural resources.	• Amount and types of natural resources harvested from the area.*	• Evidence that local communities have not been excluded from access to these natural resources.	• % change in annual natural resources harvested from the project area. • Communities' perceptions on access to natural resources as a result of the project.
	Issue: Increase levels of social capital	• Encourage the development of new social networks amongst all project participants.		• Establishment of an Employee (Or community) representative council.	• Evidence of participation or consultation in project strategic decisions.	• Number of new social networks formed as a result of the project. • Perceived benefits as a result of new social networks.
	Issue: Contribute to local economic development	• Contribute to local economic development within the project area.	• Total spending within the local economy (wages, infrastructure and suppliers)	• % of suppliers who are locally based.*		• % contribution of project to regional GDP.
	Issue: Ascertain value chain of capital flow.	• Encourage the participation of South Africans in projects	• Disclosure of all Company Shareholders. • Disclosure of BBBEE compliance, if required to comply.	• Evidence that local stakeholders are given the priority and provided an opportunity to become shareholders and participate in the project.	• % of shareholders that are South African citizens. • Number of participants in the BBBEE scheme.	• % of profits distributed to shareholders. • % of profits disbursed to BBBEE partners

* - Denotes Indicators to be used in the SD baseline determination process

5.5. Practical Considerations of the SD Framework

The organisation of the identified indicators (Table 5.5) into the IOOI framework aims to provide a structured approach to organising the SD indicators through providing a structured, easy to interpret process. However at the same time there are a number of other areas that need to be considered that work in conjunction with the framework. These relate to ensuring SD assessment practicality, effectiveness and cost efficiency especially in areas of developing SD baselines, data collection methodologies for project developers and indicator reporting guidelines.

5.5.1. SD Baselines

To determine a project's specific contribution to ensuring net positive SD benefits, a baseline level will have to be set before a project starts. This will allow for a specific project to be monitored and evaluated over time against the pre-project characteristics. There are practical considerations to setting a project specific SD baseline, especially surrounding the costs and effectiveness of obtaining and assessing the project area's current environmental and socio-economic conditions.

There is a trade-off in complexity between establishing baselines for project-specific environmental and socio-economic conditions. Environmental baselines would relate to the current environmental conditions prevalent within the proposed project area. Setting socio-economic baselines is however more complex. It requires a socio-economic assessment surrounding current land-uses and practices within the specified project area. Especially considering that projects have differing effects on the scale of the impacts as socio-economic effects cannot be isolated to a specific project area or boundary. Within the SD baseline assessment framework these need to be accounted for.

Putting in place requirements that a project has to report on surrounding the current condition of the land and environment and the socio-economic effects of the land-use will allow for the development of a standardised project SD baseline assessment methodology. The practicalities and costs however still need to be considered surrounding the establishment of these SD baselines. Requiring extensive environmental and socio-economic baselines to be undertaken will increase costs, both time and monetary, for project developers and as a result decrease the attractiveness and efficiency of the certification process. This will in turn diminish the use of the proposed standard. To overcome these challenges it is imperative that a

standardised carbon certification SD baseline assessment process is developed that is both practical and cost-effective.

The indicators developed in the expert workshop (Table 5.1 – 5.4) provide an opportunity to facilitate this. It offers the scope to identify the indicators within the IOOI framework that serves a dual role of setting the baseline and for future monitoring. However, not all of them are as adept in playing this dual role, and so a subset of these indicators needs to be selected and prescribed for projects' to use when establishing baseline conditions. The indicators that have the potential to play this role are denoted in Table 6.5 by the * symbol.

The indicators are all situated within the Output section of the IOOI framework as these are the indicators designed to give the immediate overview of a project's SD situation and current SD credentials, and therefore are equally applicable in determining the baseline of a project. It has to be noted though that utilising a subset of the Output indicators will not provide a comprehensive, in depth analysis of the current projects SD situation but it will provide a baseline for a project to be evaluated against in the future. In turn this assist in ascertaining if a carbon offset project is contributing to the provision of net positive SD benefits within the area it is situated.

5.5.2. Data Collection Methods for Indicators

Utilising the appropriate methods in collecting the relevant data is an essential step in ensuring the accuracy of SD indicator assessment and reporting. There have been a few approaches taken by current voluntary carbon standards and they relate to prescribing the methods used (e.g. SocialCarbon) to allowing a project developer to select and develop their own methods to report on the indicators required in the standard (e.g. CCBS and CarbonFix). These two approaches have their positives and negatives, and the development of the SD indicator framework has incorporated aspects of both of these approaches. While many of the indicators outlined in the IOOI framework do not require active data collection or have specified methodologies, there are a number that do.

To reduce the costs involved with the development and use of rigorous and complicated scientific methods it was aimed, where possible, to utilise existing proven rapid assessment methods to collect data for indicator reporting. This was particularly relevant within the environmental theme and the experts identified a number of rapid assessment methodologies that could be appropriate to use to collect the data for a number of indicators, these included

the Landscape Function Analysis (LFA) developed by Tongway and Hindley (2004); WET-Health developed by Macfarlane et al. (2008) and the South African Scoring System (SASS) for river health by Dickens and Graham (2002). Stipulating that projects utilise these identified rapid assessment or similar methodologies that have already been proven, tested and peer-reviewed aims to promote consistent data collection techniques and reduced costs. While these are not a definitive list of methodologies they provide the starting point for debate surrounding which methodologies would be applicable to evaluate certain indicators, e.g. is the LFA the most appropriate methodology to use in assessing landscape degradation.

The development of data collection techniques for the socio-economic indicators are however more challenging. While the majority of indicators will require internal project data there are a number that require assessment of the wider stakeholder impacts. The experts did not identify an overarching prescribed method for collecting this data, and is one area that needs to be addressed if the proposed standard is to ever be released. To make the SD assessment framework practical the methods for collecting this data will have to be interrogated and defined further as the framework is developed.

5.5.3. Reporting Guidelines and Periods

The environmental and socio-economic impacts of a project act in different time frames and at different scales. These have to be explicitly recognised in the practical implications of indicator reporting. The IOOI framework aims to achieve just this but for practicality the actual time periods need to be defined. The input and output indicators act in the immediate term, with some output indicators overlapping with the selected baseline indicators. In this case they will be required to be reported on by the end of proposed initial certification process (see Chapter 6).

The outcome and impact indicators act at longer time scales. The outcome indicators are envisioned to be reported on annually by the project to allow for the tracking, transparency and monitoring of the SD characteristics of a project. The annual assessment and reporting of these indicators will allow for the establishment of an effective monitoring programme for a project and allow for adaptive management to be instilled from a projects design phase. The impact indicators are designed to act at a broader scale and evaluate a project's effects both inside and outside of its boundaries; as a consequence it is more complex and costly to collect the required data to report on. Therefore these indicators need to be aligned with the proposed

voluntary carbon standards third-party auditing cycles (see Chapter 6). This will provide a project with a set timeframe and some long term monitoring guidelines surrounding projects' broader and cumulative long term impacts on both the environment and socio-economic situation in which they are situated.

5.6. Conclusion

Bowen and Riley (2003) state that the effective integration of socio-economic and environmental dynamics can only enrich and aid a project's decision making abilities and facilitate outcomes that contribute to sustainable development. Environmental and socio-economic indicators have to be interlinked to ensure they contribute to effective project management and performance; however this requires a large, broad set of indicators that can address as many of the factors as possible. Tracking a project's SD influence over its lifetime will provide a long-term picture of the impacts and effectiveness on improving the socio-economic and environmental sphere in which it is situated. There is however an inherent trade-off and complexity involved in developing the appropriate, broad swathe of indicators around and practicality, detail, costs and time. This indicator framework is designed to establish these links and offer a programmatic approach to assessing SD performance of landscape restoration projects within South Africa.

There are a number of challenges however in attempting to understand the relative contributions of natural cycles, episodic events and anthropogenic influence on a project and at a broader level (Bowen and Riley, 2003). These are especially pertinent in sectors where there are a myriad of other influences on systems, in particular within ecological systems (e.g. water quality) and the various socio-economic factors (e.g. wellbeing). It is for this reason that the IOOI indicator assessment framework aims to act at different scales and time frames. The majority of indicators identified in the expert workshops relate specifically to assessing controllable aspects of a project in the short term, especially with regard to socio-economic indicators. The long term indicators are however also crucial to the evaluation of the success of a project in contributing to SD. The immediate, short and long term indicators will allow for a project to track its performance and alert both project managers and other stakeholders to prevailing trends and allow for adaptive management capacity to be built.

The process outlined in this chapter has provided a basis for the top-down expert consultation and identification of the pertinent indicators that need to be considered for a South African

voluntary carbon standard for landscape restoration projects. The workshop has facilitated the first stage of the development of an SD indicator framework for restoration projects under a South African voluntary carbon standard. It has achieved this by allowing for the identification of a wide variety of indicators that will provide a holistic, but practical and cost effective, assessment of the SD characteristics and trends of a project. The incorporation of the indicators into the IOOI has achieved the second phase of this process, but there is still a long way to go in order to design an accepted, comprehensive framework that can be incorporated into a potential South African voluntary carbon standard.

This process and framework is by no means a final product and requires refining and consultation and debate with a wider variety of stakeholders in a variety of disciplines, in order to make it truly effective.

CHAPTER 6:

A Preliminary South African Voluntary Carbon Standard

6.1. Introduction

6.1.1. Purpose of Chapter

This chapter will incorporate all the ideas and processes developed and discussed from the lessons learnt in the previous chapters to create the first initial draft or ‘straw dog’ guiding framework of a potential South African voluntary carbon standard aimed at certifying landscape restoration projects. This will incorporate the preliminary SD indicator framework developed in Chapter 5 and aims to abide by the the vision outlined in Box 1.1.

6.1.2. Context for the Chapter

The developments of the various voluntary carbon certification processes have taken different routes, forms and directions. While they have all been based on a common ideas and outcomes they have all focussed on different strategies to achieve these. As seen in Chapter 3, these have distorted the market and made it difficult for both project developers and investors to select the appropriate voluntary carbon standard and projects in which to invest that align with their goals or outcomes. The majority of standards have aimed at accommodating a wide range of projects using the same certification requirements (e.g. additionality, leakage etc.) at a global level. The concept of country specific voluntary carbon standards has only just begun to emerge, and has been discussed throughout this thesis, see Chapter 3.

While these standards are a new and innovative approach to the development of the voluntary carbon market and voluntary standards, they do hold the risk of confusing the market even more. However the poor uptake of the current voluntary standards in many developing countries, especially in South Africa, highlights there are shortcomings to the current standards and opens up a niche for a new, innovative, local, cost effective standard that achieves the same (and or more) as the current voluntary carbon standards. As previously discusses, it is imperative that these standards are grounded in current market best practices so as to be accepted by both developers and purchasers within the local and global market, and as such ensure the legitimacy of the offsets. Failure to adhere to the basic concepts of certification design and as a result the incorporation of the essential criteria (highlighted in Chapter 3) will cause the carbon certification process to fail in the marketplace, through diminishing confidence in the standard and thus attracting lower prices for the offsets that obtain certification. Ensuring the confidence in the standard and the offsets it certifies is

imperative to its success and potential acceptance amongst local participants, both developers and purchasers, in the voluntary carbon market.

This thesis has so far shown that there is not one single recognised certification development process or methodology for a developing a new voluntary carbon standard. Chapter 3 and 4 have aimed at gaining a broader understanding of the voluntary carbon standards through identifying best practice as well as the vital lessons surrounding certification design and its historic application, in particular its successes and pitfalls. Particular focus and emphasis was given to developing a standard specific sustainable development (SD) assessment framework (in Chapter 5) as the standards vision (Chapter 1) is to instil and encourage SD credentials of potential projects.

6.2. Standard Design Process

6.2.1. Standard Principles and Aims

While the principles and vision of the proposed standard are outlined in Chapter 1 there needs to be clear setting of this preliminary standard and what it aims to achieve. As discussed in chapter 1 the development of this preliminary South African voluntary carbon standard has the overarching goal of making it simpler and more cost effective for South African landscape restoration projects to gain certification, but all the while maintaining both the integrity of offsets generated and the SD credentials of a project. To achieve these objectives it is vital that the standard ensure that the certified offsets meet the following overarching principles:

- Real – All GHG reductions and removals from projects have to be proven.
- Reliable – All GHG reductions and removals must be quantifiable using recognised measurement tools and they must establish a credible emission baseline.
- Permanent – All GHG reductions and removals must be for the long-term (excess of 30 years). Where a project is a risk of potential reversibility then the appropriate mitigation actions and safeguards must be abided by.
- Additional – Emissions reduction or removals must exceed that which would have happened under a BAU scenario if the project would not have taken place.
- Conservative – All project calculations must use conservative assumptions, values and procedures.

- Exclusive – Each offset must be unique and associated with a single offsetting activity to avoid double counting.
- Sustainable Development – Projects must incorporate and monitor the environmental, social and economic attributes associated with the project and promote the benefits, throughout its lifetime.
- Transparent – Key documents and information associated with the project must be publicly disclosed to allow interested parties to make decisions with reasonable levels of confidence.

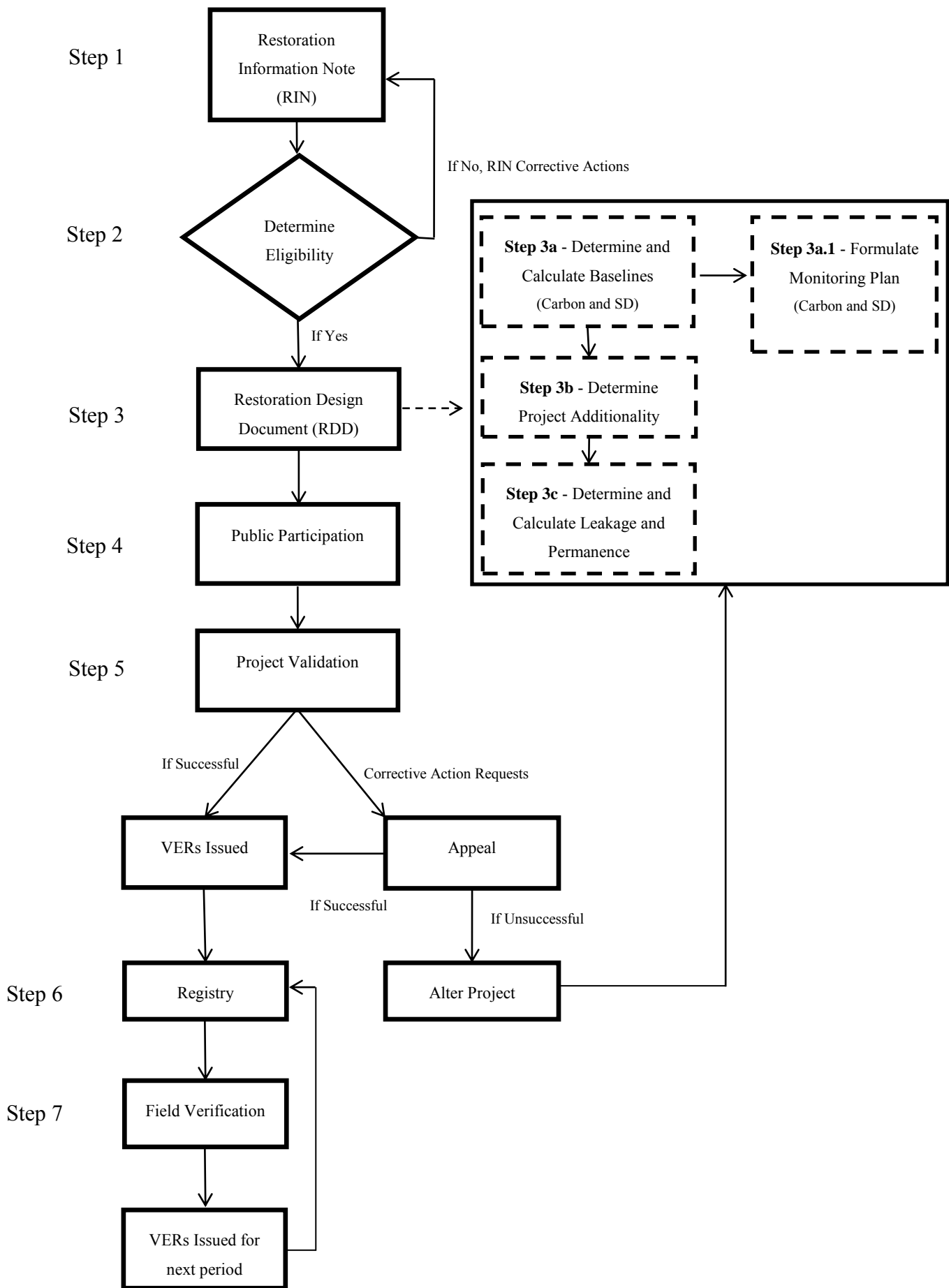


Figure 6.1: The proposed South African voluntary carbon standard certification process

6.3. The Development of a Preliminary South African Voluntary Carbon Standard

This process will be discussed in terms of where the essential criteria fit in to the different steps outlined in Figure 6.1. The main aim of this chapter is to create a proposal of a ‘straw dog’ certification process that can be used to guide the potential future development of a South African specific voluntary carbon standard. In doing this these thoughts and ideas will be allowed to be critically debated so as to assess their practicality, efficiency and applicability to potential implementers and project developers and South African conditions. This will in turn allow for a more detailed, accepted and practical standard that can be more easily implemented. This thesis will address and discuss proposals for steps 1 – 7 (Figure 6.1) and their sub sections especially surrounding the theoretical development of these concepts and how they are proposed to be addressed within a potential South African voluntary standard. While these steps are not the entire ambit that is required for a viable certification standard, they are the essential criteria highlighted in Chapter 3 and those that can be dictated and changed in the standard development process.

Step 1: Restoration Information Note (RIN) Development

i. Theoretical Development

The proposed RIN process fulfils a similar role as that of the Project Idea Note (PIN) that has been used within the CDM certification process. The CDM PIN process aims to make an assessment of the projects financial viability and estimations of its GHG reduction potential before the BAU calculations have been completed in the PDD. The CDM PIN requires the following (Hodes, 2007):

- The type and size of the project.
- Project location.
- The anticipated total amount of GHG reduction compared to the BAU.
- The suggested crediting life time.
- The suggested CER price in US\$/ton CO₂eq reduced.
- The financial structuring (indicating which parties are expected to provide the projects financing).
- The projects other socio-economic or environmental effects/benefits.

It has been argued that the PIN process in the CDM is unnecessary in that it adds extra costs and duplicates information to be provided in the PDD process. The information required does not allow for the correct scoping decisions to be made with regard to true project eligibility, rather it calls for hypothetical project scenarios to be evaluated. Thus it adds extra costs and time and acts as a barrier to project development, rather than an assist in project design and certification. The PIN document can however become a useful document in the project process and one that can work in conjunction with the PDD to decrease costs and increase efficiencies.

ii. *Standard Process*

To expedite, but ensure the quality, of the process of certification it is necessary to have as many checks on a projects integrity and potential success in place before it is implemented. This is vital to ascertain if a project is viable and if it will be successful in gaining final certification and continued operation before it has to face the expenses of PDD design, and third party validation. Developing and submitting a RIN document is the first of these processes to be incorporated in the standard. The RIN document in the standard is designed as a scoping phase that details the initial ideas and processes behind the proposed project. It has two main roles: 1) to determine if the project is eligible to apply to undertake the certification process, and 2) to identify any potential major pitfalls that the project might experience in its development. In doing this it needs to take a critical look at the project and provide enough information so that an initial decision and determination of project eligibility can be made. As such the RIN document will require information that can be used to evaluate it against the proposed *Eligibility* (Step 2) requirements.

It is envisioned within the standard, that the RIN document can play a key step in simplifying and expediting projects. However the RIN needs to be formulated correctly and require suitable information to assist both the project developers and the proposed certification body (the potential standard management agency) in understanding the detail associated with the project. To achieve this, the RIN will focus on the background to the project and allow for the assessment of the eligibility of the project for certification purposes. In doing so the RIN needs to provide sufficient information to make these judgments. It is suggested that the requirements of the RIN (Box 6.1.) will address these challenges.

RIN

- Project Title
- Type of Project (standard classification)
- Detailed Geographic Project Location and Coordinates (shapefiles, maps etc.)
- Project Time Frame (proposed start date and length)
- Description of the project (technical details - species to be used, planting method etc.)
- Proof that the project abide by all laws of the country e.g. (require an EIA, if not – proof of exemption).
- Baseline methodology to be used. If designing new methodology then this has to be motivated as to why and how it differs.
- Estimated offsets potential and project size category (tCO₂eq)
- Proposed carbon and leakage pools. Need to be motivated and proven why.
- Project developer details: contacts and list of all individuals, companies, managers and consultants related to the project and their relative roles and experience.

Project Eligibility Criteria

- Description of current and historical land use for the last ten years (land-use, property rights etc).
- Proof that only locally indigenous species at the correct densities to be planted
- Proof that the planting area :
 - Is not a natural area at project start date,
 - Has not been a forest ten years prior to project start date,
 - There is no relation between project participants and cause of deforestation for ten years before start date,
 - That no planting occurs within areas that were/are different ecological areas originally (e.g. vegetation types, biomes, wetlands etc.)

This is a unique and novel approach to instituting a comprehensive, mandatory scoping phase for projects through the RIN document. It aims to turn the RIN from merely a supporting document into a major, useful project document that guides the initial scoping and design and proof of eligibility before a project begins. This will also allow the restoration design

document (RDD) to be simplified and to focus on just the essential criteria that need to be met for certification. This will simplify the process for both project developers and certifiers and thereby reduce the costs and increase the efficiencies in both the project design and validation.

Step 2: Determine Eligibility

Once completed, the RIN will have to be submitted to and evaluated by the certification body (or the voluntary carbon standard governing body). The RIN will be evaluated against the Eligibility criteria (outlined previously in Box 6.1). If the project is deemed eligible the project developer will be given permission to begin compiling the Restoration Design Document (RDD). If the project is not deemed eligible, the project developer will have to rethink the project and submit a new RIN with the required amendments as determined by the RIN corrective actions. To expedite the certification process the certification body will review and return the RIN with a record of decision within 30 days of submission; this will allow for the timeous and efficient processing of RINs.

It is imperative that the project developer is not kept waiting on decisions from the certification body, this has the potential to cause a ‘log jam’ effect and slow the entire certification pipeline. This in turn introduces new and higher costs for project developers.

Step 3: Developing Guidelines for a Restoration Design Document (RDD)

i. Theoretical Development

The development of the project design document (PDD) is the most important part of the certification process, and the RDD required within this proposed standard aims to fulfil this step. In the current CDM and voluntary carbon certification processes the PDD is used to describe the entire project process from baseline calculations and monitoring plans to leakage requirements, risk assessments to project boundaries and project participants. It is the cornerstone document that is submitted to the certification body and the information contained within it is what a project is validated against. However current PDDs have been criticised for being overly complex and confusing. The United Nations Environmental Programme (UNEP, 2008) highlighted 38 pitfalls associated with the projects developing the CDM PDD and that cause significant delays in the process. These ranged from a “lack of logic and consistency in the PDD” to “absence of baseline data”, “poor quality of PDD”, “insufficient explanation of baseline scenarios” and “monitoring and project management

procedures not defined”. These all stem from the CDM PDD requirements being overly complex, disjointed and ambiguous which has led to misinterpretation by the PDD developers. The main point of contention has arisen in what is actually required within the PDD (UNEP, 2008), and this can be seen from the CDM pitfalls above and the same confusion has extended into voluntary markets PDD design as well.

The main areas of confusion centre around whether the PDD requires reporting on both detail surrounding proposed methodologies and actual calculations (e.g. actual baselines) or if it just includes providing the proposed methodologies to be followed. While it is supposed to be unequivocal that the actual detailed calculations are required in the PDD, it has been misconstrued by project developers and has led to confusion in the project design phase (UNEP, 2008). This has increased costs and project failures due to PDDs failing the validation phase. Therefore it is vital that this process is streamlined and unequivocal so it can be used to inform project developers of the exact detailed information that is required to obtain validation and certification. Providing this information will make the certification process more cost effective for project developers through reducing costs from possible corrective actions in the validation phase.

ii. Standard Process

It is envisioned that the requirement for a more detailed RIN document that it will allow for the streamlining and simplification of the entire RDD process. Allowing for an initial evaluation of the project detail, eligibility and proposed methodologies in the RIN and then a subsequent submission and evaluation of the detailed project information, such as baseline calculations, additionality determination, leakage and permanence assessments and monitoring activities in the RDD will allow for a more streamlined and efficient process. This will in turn shorten and simplify the final RDD document and make the validation and verification process more efficient through reducing the time needed for the validation process. The proposed certification process is outlined in Figure 6.1 and the detailed requirements of the RDD (Steps 3a – 3c) will be discussed below.

Step 3a: Determine and Calculate Baselines (Carbon and SD)

Determining the baseline levels of a project area is a crucial component in the certification process. As discussed in Chapter 3, a baseline attempts to represent the proposed BAU scenario if an offset project was not implemented. This allows for the number of credits

generated from a project to be determined. The difference between the BAU scenario and the emissions reduction resulting from a project equals the amount of credits generated from the project (Kollmuss et al., 2008), and as such the amount of offsets allowed to be traded.

The different forms of carbon baseline methodologies have been extensively discussed in Chapter 3 and for a South African specific voluntary carbon standard it is proposed that project specific baseline methodologies will be used to determine the carbon sequestration for landscape restoration projects. This has been done for two reasons: 1) they provide the context specific information, as highlighted by Moura Costa et al. (2000) and Murray and Sommer (2004) and 2) they have been widely developed within other certification systems for LULUCF projects (e.g. CDM, VCS, CAR etc.) and are publicly available.

Baseline methodologies so far have mainly focussed on the carbon aspect of projects. Standards such as the CCBS, CarbonFix, SC and GS have aimed to introduce and ensure that the baselines and monitoring of co-benefits are taken into account, but this has gained little acceptance within larger fully fledged standards such as the VCS. It is imperative that these begin to gain more prominence in the voluntary carbon standards. There needs to be a monitoring process instilled within the co-benefit assessment methodology that allows for the evaluation of a projects contribution to the generation of co-benefits over time. One way to achieve this is through setting and calculating a pre-project baseline of the holistic project situation, i.e. of both carbon and SD benefits. This is consistent with the standards overarching goals and principles of ensuring and integrating the generation of SD benefits throughout the certification process. However within the standard the development of the carbon and SD benefit baseline methodologies and monitoring plans will take different paths.

Carbon Baselines

Developing and selecting baselines methods to calculate the carbon BAU scenario is a critical step in the process. There are three proposed options within this step: i) selecting a pre-approved baseline methodology, ii) developing or altering a new baseline methodology, or iii) adapting an existing methodology.

i) Selecting a pre-approved baseline methodology

There have been a wide variety of baselines developed and approved by existing standards and they have become freely available for any project to use. The majority of voluntary carbon standards have taken this route and allowed for the use of the methods approved under

different frameworks. This standard will allow for the same process. While these methods would still have to be reviewed and accepted by the final certification body according to the standards criteria and principles, the potential of utilising these existing methods will allow for the expediting of projects and the avoidance of the unnecessary development of methodologies that already exist. These methodologies will have to be screened to ensure that they abide by the principles of the standard and are applicable to South African conditions before they are accepted and allowed to be used. Initially this will focus on landscape restoration methods but it has the potential to extend into other areas once the standard has been adequately developed.

This however is not the only way in which methodologies will be approved by the standard. There is a trend amongst voluntary carbon standards for the development of a standardised methodology approach (CAR, CarbonFix), that is baseline methods designed and approved internally by the standard and then released for use by project developers.

This is a dual methodology pre-approval process is a novel and unique approach that has not been fully explored within current voluntary carbon standards. Through following this approach it will provide the standard with a comprehensive list of methodologies that can be used for a wide variety of projects. It will also make the standard more attractive to project developers due to the ability to use a pre-approved methodology, rather than developing their own, and thus reducing costs and increasing efficiency.

iii. Developing and submitting a new baseline methodology

If a suitable carbon baseline assessment method does not exist it is up to the project developer to design the appropriate method. The new method will then be submitted and approved by the certification body that will ensure it abides by the principles and criteria that govern the standard. If the method does not meet the requirements of the standard it will be rejected and the project developer will need to resubmit with the necessary corrections. As highlighted in the RIN, the project developer's intention to submit a new methodology will have to be indicated and motivated. If accepted then the methodology review process will have to be followed before the submission of the RDD to allow for the baselines to be calculated during the RDD phase.

Currently the submission and approval process of new baseline methods within some voluntary standards, and the CDM, has been criticised for their stringent, rigorous and time

consuming methodology review and acceptance processes. This has often times stalled and limited the acceptance of new project types and the associated methodologies. This has arisen from overly stringent and comprehensive review systems, such as the VCS double-review process.

To overcome this, the proposed South African voluntary carbon standard will have to set up a methodological technical review panel with the specific mandate to review the applicability of new methodologies within a set time period from submission, in order to provide the project developer with clear direction. If the methodology is rejected by the technical review panel, the project developer will be allowed to appeal the decision, in which case the methodology will be submitted to an external third party reviewer. The third party reviewer will then make the final decision with regards to the acceptance of the methodology. This process is unique and will allow for the efficient and effective acceptance of new methodologies.

iv. Adapting an existing methodology

The third option relates to adapting an existing baseline methodology to the condition of the current location of the project. This is particularly evident in methodologies designed for projects situated in wetter areas and then attempted to be applied in more semi-arid areas (Powell, 2011, pers. comm, 10 Nov). While the majority of the methodological design is suitable there are adjustments that need to be made in order to be practically applied in other locations. It is for this reason that the proposed standard will allow for the altering of methodologies accepted in other standards.

There does need to however be a cautious approach and it needs to be debated surrounding how many alterations are made until a methodology becomes a new one and has to enter into the process outlined in *option i* above.

Sustainable Development Baselines

To assess the SD baselines of projects the standard will follow the standardised approach developed in Chapter 5. The Gold Standard, CCBS and SC all follow this same process and have been lauded for their integration of SD considerations into the certification process. The baseline is calculated through doing an initial assessment of the pre-project BAU scenario using the standard developed SD assessment tool in Chapter 5. This then allows for the monitoring and reporting of the SD benefits of the project based on the same evaluation

system. This also allows for a consistent and transparent assessment of a projects contribution to ensuring positive SD benefits throughout a project’s lifetime.

Step 3a.1: Formulate Monitoring Plan (Carbon and SD)

i. Carbon

An efficient and accurate monitoring plan is integral to the success and integrity of the carbon offsets produced by the project. While it has been incorporated into the overall baseline methodology design previously, it is required within this standard as a separate section. This is envisioned to allow for the accurate evaluation of the proposed monitoring methodology. This will allow for judgements and recommendations to be made individually between baseline and monitoring methodologies. The monitoring methodology will be required to be submitted alongside the baseline methodology.

ii. Sustainable Development

The SD assessment and monitoring framework has already been discussed in Chapter 5 and it will follow a standardised approach. The SD credentials will be assessed and monitored according to the developed SD evaluation system.

Step 3b: Determine Additionality

The concept of additionality is crucial to the development and acceptance of carbon offsetting projects as it adds legitimacy and transparency. While this concept has been touched on throughout this thesis (especially in Chapter 3) there needs to be a critical examination of its theoretical development that will aid in the development of a proposed additionality tool for a proposed South African voluntary carbon standard.

i. Theoretical Development

Since the beginning of the development of the official carbon market through the creation of the CDM there has been the debate about how to ensure the environmental integrity of the offsets within the market. Key to this was determining that credits are issued to projects that are reducing or mitigating emissions that would not have occurred without the development of the CDM and carbon markets. Article 12.5(c) of the KP made this formal through declaring that “emissions reductions made through the CDM project activities in non-Annex 1 countries cannot be reductions that would have occurred in the normal course of activities

(cannot be BAU). This has become to be known as additionality and is ascertained by requiring projects to demonstrate their compliance through a number of tests. However, as outlined in Chapter 3 of this thesis, this process has become highly controversial and the interpretations and implementation of the additionality test has become highly varied between CDM projects, DOEs and DNAs (UNEP, 2008). This has led to concerns around the credibility of additionality testing amongst new CDM methodologies and a move by the CDM EB to standardise the additionality testing methodology.

The current CDM additionality tool has been designed for large scale, bureaucratic, government funded CDM projects and to be used across all different project types; it is within this that the tool has become distorted and complicated (Houdashelt et al., 2006). It is inherent that projects such as renewable energy and landscape restoration projects face different challenges and constraints to additionality determination and assessing them within the same framework has introduced the subjectivity, impracticality and complexity currently associated with the current additionality tool. The relatively new additionality testing guidelines developed by the CDM methodology panel provided examples of how a new methodology could assess why the proposed CDM project activity is less likely to occur than one or more of the other possible scenarios. These recommendations formed the basis of the development of the current additionality determination tool. This tool incorporates a pre-approved multi-step additionality determination process and has become the most widely accepted additionality determination process, with it being mandatory for CDM projects and incorporated into many voluntary standards. The use of this tool has become to be seen as a 'safe option' by many standards and project developers and thus has created the 'precedence effect', under which this additionality tool has become preferred over other additionality tests (Houdashelt et al., 2006).

This tool has however not escaped criticism. It has been derided for its subjectiveness, impracticality and for being overly detailed (Schneider, 2009). The inclusion of the various stages required to determine additionality, especially the financial additionality, call into questions the motives of the CDM EB and the actual purpose of imposing these multi-step, mandatory additionality processes. There is a strong call emerging, for only the emissions and environmental additionality of projects to be tested, in that all projects that contribute to the reduction or mitigation of emissions should have the option to be considered additional (Schneider, 2009; Alexeew et al., 2010). Financial additionality is the major key criticism of

the current additionality tool. It was initially developed to assess whether Annex 1 countries were using their already budgeted official developmental assistance money, given to non-Annex 1 countries, to fund CDM projects and, as such, receive the CDM credits for funding they would have provided anyway (Dutshke and Michaelowa, 2006). It has now arisen that through using financial information to make an assessment of a project's additionality makes it possible for the unwarranted consideration of a project, especially those that are developed by the private sector.

One of the other additionality tests allows the CDM EB to determine and analyse the actual initial intent of the project. It is argued that this is an area that cannot be assessed in an impartial, consistent and objective manner, and intent of the project is not something the KP actually requires. The current CDM additionality tool is making unfair judgements on projects and this has led to the potential exclusion of a number of projects in developing countries which are actually additional and could provide SD benefits to these countries. Financial additionality is not the only additionality step facing criticism, the other steps such as barriers to implementation and common practice tests have also been highlighted for their shortcomings (Houdashelt et al., 2006). These two tests introduce unnecessary complexity and subjectivity and do not address the original additionality intention of ensuring environmental integrity. Requiring projects to prove that they face a significant barrier to implementation allows them to obtain an easy step in additionality testing as most projects face one or other of the wide ranging, broad barriers on the implementation list (www.cdmrulebook.org). It also has the potential to encourage project developers to understate their actual project details to simply pass through this step. While the common practice step, which ensures that credits are not generated by projects that are using a standard practice in a given area, is valid it is short sighted. It is potentially limiting for future offset projects within a specific area as the question has to be asked: at what threshold, such as time, does landscape restoration or wind power become a common practice or technology that cannot generate credits anymore even though it is contributing to decreasing or mitigating GHGs. There needs to be a review of these additionality tests with the goal of removing the subjectivity and complexity associated with them.

Due to the 'precedence effect' discussed earlier (see pages 131-132) the CDM additionality mechanism has been widely adopted by the voluntary carbon market today, but it has been transformed and moulded to meet its requirements. This has however allowed for the

permeation of the pitfalls and shortcoming into the voluntary market and voluntary carbon standards. While the current additionality thinking and methodologies are valid and vital starting points, additionality should not be such a significant barrier to project development, as it currently is. Complexity and subjectivity of proving additionality introduces major forms of costs, both monetary and opportunity, for all participants in the market from project developers and certifiers to investors. Its widespread acceptance within the voluntary carbon markets has led to the exclusion of many smaller, truly additional projects as they simply cannot afford the costs associated with the CDM and the current voluntary standards (Houdashelt et al., 2006). It is not the explicit mandate of a voluntary carbon standard to assess the financial soundness and intent of the project in the additionality testing phase, neither is it within their mandate to make a subjective assessment of the actual intent of the project using the barriers to entry or common practice tests. The development of new voluntary carbon standards offers the opportunity to address these pitfalls and develop new simpler, less excluding additionality determination tests and tools.

There have been many new forms of additionality testing proposed and introduced to counter just this; including additionality benchmarking, technology lists and a baseline approach. While the current CDM tool has focussed at a project specific level of additionality testing, these new additionality processes focus at a broader performance level approach (Houdashelt et al., 2006). While the broader level additionality tests are the eventual end goal for many standards, at the moment they are limited due to the uncertainties and complexities associated with determining an accurate wide-ranging baseline scenario or benchmark (Murray and Sommer, 2004). Until the appropriate research, data and methodologies have been generated to determine the accurate and appropriate performance-based additionality tests for different projects, locations and technologies, there has to be a new approach.

Additionality testing faces the challenge of assessing the hypothetical future scenarios that would have happened if the current project had not gone ahead, and it is for this reason that the process needs to be as straight forward as possible. To develop a new additionality tool it is vital to go back to the original intent of additionality testing, and that is to ensure the environmental integrity of projects and not their financial credibility or intent. While latter are valid tests to ascertain overall project integrity, the additionality framework is not the correct area to incorporate them in. They rather should be incorporated into other areas of the certification process such as assessing the financial considerations of a project to ascertain its

permanence credentials. This is especially relevant in the voluntary markets and amongst voluntary carbon standards which have the opportunity and flexibility to develop new and innovative techniques to additionality testing. As has been said previously, this has not happened and the opportunity exists for a re-examination of additionality within the voluntary market certification context.

It is essential avoid the pitfalls of the current additionality tool and that entails redesigning the approach to ensure a straight forward, cost-effective tool that will ensure the evaluation of the environmental integrity of projects. It will also encourage and assist the development of projects through streamlining the process. To achieve this it is vital to borrow from existing standards, such as CarbonFix (see Chapter 3). This standard only certifies LULUCF projects and it utilises a dual approach to additionality determination. Project developers can either utilise the CDM tool or a more straightforward, simplified, standard specific process. It is this second additionality determination process that is unique. It provides for specific, project based (e.g. landscape restoration) additionality criteria to be established. This provides for a simplified approach to additionality determination and understanding for project developers, certifiers and potential voluntary offsets buyers. It allows for the removal of the subjectivity and impracticality of other additionality test. This tool does however still include elements of the financial and common practice tests and as such makes unfair judgements on the project's intent.

There is a growing trend amongst voluntary standards, one that has been pioneered by the GS micro-scale scheme, which offers a streamlined approach to certification for micro-scale renewable energy projects. This includes granting micro-scale projects automatic additionality as they face significant and varied barriers to implementation of projects, but are mainly financial and expertise. This is a novel way of encouraging small scale, community based offsetting projects through reducing complexity and the costs associated with determining additionality.

ii. Standard Process

To design a South African voluntary carbon certification standard the additionality process needs to be refined and reviewed. It is vital to ensure the environmental integrity of projects whilst at the same time addressing all the concerns highlighted above. To fully address the subjectivity and complexity associated with the CDM additionality tool it is vital to make it

as straightforward as possible and this is where the South African specific, sectoral additionality tool needs to be developed. This process allows for the differing additionality requirements of each project type to be individually met, thus if biogas projects require a multi-step additionality approach it can be developed within the standard, while if wind power is best served with a baseline or benchmark approach this too can be incorporated into the same standard. As the initial project type that the standard will focus on is landscape restoration projects within South Africa, this will be the first additionality tool developed by the standard. Due to the complexities associated with landscape restoration projects and the lack of such projects within South Africa it is necessary to develop a project specific additionality tool that can be easily interpreted, applied and understood.

The determination of additionality is inherently based within and on hypotheticals, as it is relatively impossible to prove that which has not happened yet or will happen in the future. This tool aims to incorporate the current innovation and best practice. It encourages the participation of small scale projects through providing them with automatic additionality. The argument of size classes and scale however is crucial to the determining the viability of the project and as such the need for additionality testing. Scale has becoming a driving factor in both increasing attractiveness of the offsets and decreasing the costs of producing each offset. The size classes within various standards have generally followed this format (Peters-Stanley et al, 2011):

- Micro (less than 5,000 tCO₂e/year)
- Small (5,000 to 19,999 tCO₂e/year)
- Medium (20,000 to 99,999 tCO₂e/year)
- Large (100,000 to 500,000 tCO₂e/year)
- Very large (greater than 500,000 tCO₂e/year)

Automatic additionality has generally been applicable to projects at the micro-scale. However Powell (2011, pers. comm., Nov 10) calculated that in the sub-tropical thicket biome of the Eastern Cape, South Africa projects of up to 1000 hectares would fall into the micro-scale (when using an estimate accrual rate of 1 tC/hectare/year over a 30 year period). While these are the micro-scale projects that the standard aims to incorporate, the transaction costs of establishing a landscape restoration on such small scales has the potential to not be financially feasible, Mills et al. (2009) maintain that a project of 10 000 hectares in the sub-tropical thicket is only financially viable.

There is increasing recognition for the need for scale in LULUCF projects, both to capitalise on the economies of scale for such projects to reduce costs (Mills et al., 2009), but also to ensure broader SD benefits that accrue from actively working to restore large areas of landscape functioning. Thus this size classification needs to be restructured for the South African situation and reconsidered in order to encourage the development of projects of a larger scale.

It is proposed that the size classes for South African landscape restoration projects be broadened to the following: Small (less than 10,000 tCO₂e/year), which translates to a project area of 2500 hectares using a sequestration rate of 1 tC/hectare/year; Medium (10,000 – 29,999 tCO₂e/year), Large (30,000 – 49,999 tCO₂e/year) and Mega (greater than 50,000 tCO₂e/year). This will allow for the inclusion of a wide range of projects and reduce the costs and time associated with additionality determination for both project developers and certifiers.

The multi-step tool developed also focuses primarily on the environmental integrity of the project in the additionality determination phase, through focussing on the current and historical land-use scenarios. It is envisaged that constructing this tool will make it more efficient and cost-effective while reducing subjectivity and complexity in the certification application and verification process for all parties. Other facets that have been raised in the literature surrounding additionality determination, such as financial considerations, will be examined in other sections of the standard, as they have been deemed to be more relevant in such sections.

The landscape restoration sector requires a project specific multi-step approach to additionality determination. The initial design for the South African landscape restoration sectoral additionality tool is outlined in the Box 6.2.

Box 6.2. Additionality Criteria

Additionality

Project Size Determination:

Small - < 10,000 tCO₂e/year

Medium – 10,000 – 29,999 tCO₂e/year

Large - 30,000 – 49,999 tCO₂e/year

Mega - > 50,000 tCO₂e/year

If a project is small, they are considered automatically additional. If a project is classified as medium, large or mega then they have to follow the steps outlined below:

Evidence must be given that the project would not occur under the baseline scenario by:

- 1) Providing a description of the current and most likely future land-use within the project area in lieu of the project.
- 2) Providing proof that woody biomass would not increase rapidly (within 30 years) without human intervention within the project area;
- 3) Proof that project activity is not required by any South African law, statute or regulatory framework
- 4) Proof that there are no similar projects that exist within the immediate area (still to be determined) that are viable without generating VERs;

Step 3c: Determine and Calculate Leakage and Permanence

Step 3c.1: Leakage

i. Theoretical Development

As discussed in Chapter 3 leakage is defined as an increase or decrease in GHG emissions that occurs outside a projects boundary but is measurable and attributable to the project activities Moura Costa et al. (2000) state that leakage assessment must include the indirect impacts which may arise from the implementation of a GHG offsetting project, and must therefore include both positive and negative leakage externalities.. The complexity of determining and calculating leakage is highlighted in that a key characteristic of projects (especially landscape restoration projects) is that they are location and sector specific, however, leakage can spill out both within a sector and across sectors. Accounting for potential leakage is one of the most prominent concerns often raised by environmental advocacy groups surrounding LULUCF carbon sequestration projects (Murray et al., 2007).

Two pre-dominant forms of leakage have been identified for landscape restoration projects, these are: 1) activity shifting from the project area, 2) combustion emissions associated with fossil fuel use in site preparation and management. There have been criticisms surrounding what forms of leakage should be directly attributable to the project and as such taken into account in the calculation of the projects GHG offsets. While combustion emissions are relatively straightforward to understand, activity shifting has become the major contested area within leakage assessment. It was originally designed to take into account and assess both the physical and market related aspects of the project activity (Murray et al., 2007). Physical aspects relate to the actual displacement or movement of the stakeholders affected by the project, e.g. afforesting land that would have been used for agriculture may force farmers to move to an area outside the project boundaries and as such degrade and release CO₂ from that land, thus negating the offsets of the project (Garcia-Oliva and Masera, 2004). Market related leakage is the more controversial form of activity shifting, both in terms of identification and accurate calculation. It is defined by the CDM EB (UNFCCC, 2005) as: “leakage which may include the increase in GHG emissions occurring outside the project boundary, attributable to effects of price, supply or demand of goods affected by the market impact of the project activity.” It has traditionally been attempted under the CDM to calculate country and sector

wide leakage; however the lack of accurate data has made calculation extremely difficult and led to its exclusion from leakage calculation requirements by the CDM EB.

Identifying all sources of leakage is essential to accurately calculating the true offsetting potential of a project, but it is incredibly complex to identify and account for all sources in practice (Murray et al., 2004). There are two approaches for accounting and monitoring leakage; these could either be project-specific or a standardised approach. Project-specific leakage design has to include careful site selection, good project design and establishing control plots in areas independent from the project area (Auckland et al., 2003). Standardised approaches include the use of discount or an adjustment co-efficient developed by project type or region (Brown et al., 2007; Murray et al., 2004).

This issue has been incorporated and addressed differently by all the current voluntary certification standards. Some provide detailed carbon pools and activities (e.g. CarbonFix and CAR) that have to be assessed, calculated and subtracted (negative) or added (positive) to the overall emissions reductions of the project where other voluntary standards require that the project identifies and reports on leakage sources that they have identified and calculated (e.g. VCS, ACR and CCBS). Other standards have deemed that leakage is insignificant and thus does not need to be taken into account (e.g. GS, VER+, CCX). One similarity that exists amongst all voluntary carbon standards that calculate leakage is that they take a project-specific approach to leakage determination. This allows for the context specific, accurate calculation of the projects leakage assessment.

ii. Standard Process

The proposed South African voluntary carbon standard will also follow this project-specific, approach to leakage determination. This will not only add accuracy to the overall project offsets calculation but also add to the legitimacy and environmental integrity of the project. Leakage determination runs the risk of introducing complexity and increased costs through a lack of direction on what is required to obtain certification. The leakage guidelines have to be as clear and straightforward as possible to allow for ease of interpretation by the project proponent and assessment by the validator. The proposed South African voluntary carbon standards landscape restoration leakage requirements will focus on, and account for, the leakage from 1) physical activity shifting, 2) combustion emissions associated within the project boundary and 3) carbon lost through soil erosion.

While activity shifting and combustion emissions are well documented forms of leakage and discussed above, carbon lost from erosion has been neglected within current standards especially relating to LULUCF projects. Mills et al (2005) state that in the sub-tropical thicket biome of the Eastern Cape, South Africa for every 20cm of topsoil lost it carries about 50% of the carbon stored in the landscape. This has to be taken into account when designing a project in South Africa, especially in areas of high erosion potential and as such could lead to high levels of leakage.

A crucial determination in the leakage calculation is the definition of the GHG assessment boundary (both physical and social), defining the boundaries too broadly adds unnecessary costs and inefficiencies to the process, while limiting the boundaries understates the leakage from the project and thus is not an actual representation of the projects emissions reductions.

To address these issues, the proposed leakage assessment methodology for the proposed South African voluntary carbon standard will be outlined in Box 6.3.

Box 6.3. Leakage Criteria

Leakage

Project Proponents are required to assess, account for, mitigate and report on all the forms of negative leakage within the GHG assessment boundary outlined below:

GHG Assessment Boundary – is defined as the physical boundaries of the project and social extent of actors officially employed or remunerated by the project. The physical boundaries relate to the geographic location and activities of all those involved in the project. The social extent relates to all entities involved in the project from land owners and labourers to managers, consultants and certifiers, but only relating to their emissions as a result of direct involvement in project activities.

Leakage has to be reported on activities that directly relates to or are caused by the project:

Leakage Pools

Activity shifting

- Shift of livestock farming out of project area.
- Shift of fuel wood harvesting from project area.

- Resettlement of people from project area.

Combustion emissions

- Transport associated with project activities.
- Flights directly associated with the project activities.
- Vehicle trips (suppliers, consultants, employees etc.).
- Tools and machinery involved in project activities.
- Use of fertilizers within project area.

Soil carbon

- Report on annual top soil loss within project area.

All identified leakage pools need to be described and if not relevant need to be motivated why not.

- Leakage pools need to be recorded and monitored from the proposed project start date throughout the lifespan of the project.
- Leakage needs to be mitigated as far as possible, if not possible then subtracted from the overall offsets calculations. Leakage must be calculated according to the IPCC 2006 Good Practice Guidelines for LULUCF projects (<http://www.ipcc-nggip.iges.or.jp/public/gpplulucf/gpplulucf.html>).
- For combustion emissions a project can use a standard approved carbon calculator such as Food and Trees for Africa (<http://www.trees.co.za/>).

This standard takes a unique approach to calculating and offsetting emissions from activities associated with a project's activities and participants. While many standards argue that the emissions from fossil fuels are negligible, under this proposed standard they are required to offset these. This is done to ensure the ethical and environmental integrity of the standard and that the projects certified maintain these high levels of integrity. Accordingly a project is required to demonstrate its own yearly carbon neutrality throughout the life span of the project through mitigating its own leakage. This will in turn provide more legitimacy to the carbon offsets generated from a project and the principles and aims of the certification process.

It is envisioned that this simplified and straightforward approach to leakage assessment will assist the project developers in the development of the RDD and the continued monitoring of an essential criteria of a voluntary carbon standard.

Step 3c.2: Permanence

i. Theoretical Development

As discussed in Chapter 3, permanence is an issue that relates directly to LULUCF carbon projects and has been defined as the potential reversibility of the carbon sequestered within the biosphere (UNEP, 2008). Unlike the mitigation or avoidance of GHG emissions (in energy efficiency or renewable energy projects) only those projects related to LULUCF activities entail the sequestration of carbon from the atmosphere into the biosphere, a process which is inherently non-permanent. The risk of the reversal of the carbon sequestered relate to various possibilities such as fire, natural hazards, pests, land-use decisions and poor management (UNEP, 2008). LULUCF projects have gained a poor reputation based on the issue of delivering permanent emissions reduction and buyers in a compliance-based trading system do not want to take on the extra liability and risk associated with such projects. Under current CDM practice CERs generated through forestry activities are only temporary and must be replaced by the Annex 1 country either at the projects end date or upon re-release of the captured carbon. The risk of the permanence of the offsets is one of the main reasons why landscape restoration projects have not gained traction and prominence worldwide and have not been accepted in the world's largest compliance market, the EU ETS (Streck et al., 2009). The purchase of temporary credits or (tCERs) currently does not make financial sense to potential investors; it is the equivalent to postponing compliance with reduction obligations to a future period where potentially the price per CER is higher.

To counter this current negative perception of risk and liability associated with LULUCF type projects, the voluntary market has developed new and innovative techniques to deal with the issue of permanence. It is vital that environmental integrity and long-term reliability credits generated from landscape restoration projects are safeguarded; through reducing their inherent risk and make them more competitive and appealing to potential investors. Financial risk management instruments have been adapted for the voluntary carbon markets (UNEP, 2008). The main tool is the standard specific deployment of a self-insurance mechanism with

an aim to guarantee the permanence of carbon sequestered. The tool is a simple yet effective tool and has been called the buffer pool approach.

The advantage of the buffer pool lies in its simplicity. It allows a project to produce permanent credits regardless of project type. It works in the following way: a portion of the carbon credits generated from each project are withheld and added to a common buffer pool, so that the rest of the projects credits can be sold as permanent credits. If a project does collapse and its bio-sequestered carbon released back into the atmosphere then a corresponding amount of the withheld credits would be debited from the common insurance pool to replace the credits lost in the project (UNEP, 2008). In this way the risk associated with individual projects is mitigated using a portfolio approach. This approach follows a similar approach to conventional insurance schemes, and the credits withheld can be loosely viewed as the conventional risk premium while the portfolio of projects allows for the smoothing out of variations in the claims.

The buffer pool approach is not without its critics. The major criticism that has been levelled at the opportunity cost of utilising a buffer pool approach. This comes in that restored land that could be potentially used for monetary gain is otherwise unused (UNEP, 2008). The second criticism, but one that has not been fully explored in the current literature, is the moral hazard problem in the risk determination process and the true assessment of the risk profile of the project. Currently the risk determination process is carried out by the project developer and then assessed by validators in the validation phase. However, they are only able to validate the risk on the information that they have been provided. The moral hazard problem is prevalent in some cases, especially those where the buffer pool is determined according to the outcomes of the risk assessment tool. The project developer has an incentive to downplay the risk associated with the project and therefore understate the potential risk of reversal, or overstate the effectiveness of the risk mitigation activities which they undertake. This will then reduce their buffer pool contribution and thus they are able to sell a higher number of possible offsets. Validation of the PDD is then undertaken on the information that is provided to the validators by the project developers. It is within this that there is information asymmetry and the possibility of the understated risk determination to be validated and a lower amount contributed to the buffer pool. This lower contribution then means that the remaining risk associated with the project is then *de-facto* transferred to the other projects in

the portfolio, as their buffer pool contributions would have to subsidise the projects offsets if it did lead to a reversal.

Some standards avoid this situation by prescribing that all projects have to contribute a set percentage (e.g. 30%) to the buffer pool. This, however, can once again result in understatement or overstatement of a project's risk profile. Mignone et al. (2009) argue in favour of explicitly calculating project based reversal risk as it reflects the true nature of the specific risk. As a carbon offset is an inherently risky asset this has to be done transparently and along a continuum to allow for the process to adjust risk valuations and reflect the projects risk context in the broader carbon market (Mignone et al., 2009). To ensure that this process is transparent, Mignone et al. (2009) state that the valuation process has to be done by a central authority (e.g. the voluntary carbon standard body). This would encourage lower compliance costs and objectivity without violating the environmental integrity of the entire system.

The majority of current voluntary carbon standards (VCS, VER+, CAR, ACR, CarbonFix, CCX, Plan Vivo and PS) utilise this buffer pool approach as their main permanence tool. This tool has been combined with other tools such as 'project implementation agreements' (PIA) and other legally binding commitments to ensure the long-term commitment of both finance and land to the project. While the carbon credit buffer pool is the most widely used permanence tool it has been implemented in many different ways. Standards differ in their buffer pool determination process. Some require a complete risk assessment process (VCS) and then the buffer is determined according to a project's risk profile, while others (CarbonFix, CCX, VER+) require a set amount of offsets to be placed in the buffer pool, regardless of their risk profile. Not one standard utilises the central risk determination process as suggested by Mignone et al. (2009).

In addition to the development of risk assessment and buffer pool approaches there has been the development of PIAs. These relate to the imperative to prove that the tenure of the land on which the project is based on is secure and legally binding. They also relate a legal commitment to ensure that the carbon is stored for a set length of time, ranging from 30 to 100 years depending on the standard. A combination of these tools is will contribute to ensuring the permanence and associated trust of a land based carbon offsetting project, however it needs to be designed to address the criticism associated with the current permanence approaches. To achieve this a permanence tool specifically suited to South

African conditions will be designed for this proposed South African voluntary carbon standard.

ii. Standard Process

As a key issue in the determination of offsets integrity it is imperative that the permanence of landscape restoration projects is thoroughly investigated in a project's design phase. This permanence approach developed is an amalgamation of the best practices identified throughout the current voluntary carbon standards.

It aims to address the criticisms levelled through using an adapted approach from the one suggested by Mignone et al. (2009) and a combination of both the standardised and variable buffer pool determination approaches. It is envisioned that the buffer pool process will be a driving risk mitigation process within the standard, but this will take a unique form. It is proposed within this standard the goal of a variable buffer with rebates for proof of risk minimisation and mitigation.

Each project will initially be prescribed a default base level contribution of a set percentage of the projects credits to the buffer pool (e.g. CarbonFix, VER+). While this level still needs to be determined it will account for the risk associated with at a project start up and the inherent risk of reversal involved in landscape restoration projects. This contribution will then be evaluated according to the proposed field verification timeframes (every five years, see step 7). If a project demonstrates successful risk mitigation and minimisation activities they will then be returned a proportional amount of credits and their buffer pool reduced accordingly. If a project fails to prove the success of its risk reduction activities, the buffer pool contribution will remain at the base percentage. The consistent and effective management and monitoring of a projects risk profile will allow for a project to potentially reduce its buffer pool contributions over time and thus maximise its sale of offsets. This mechanism will provide a positive incentive for projects to actively manage the reduction of their risk.

To ensure objectivity and transparency provision is made for the project proponent to obtain the evaluation of an external third party; this is for cases where the project proponent completely disagrees with the standards risk profile evaluation.

Permanence of a project relies on secure land tenure and the identification of a managing body or institution. To obtain certification, projects will need to demonstrate secure tenure

and what the category of land the project fits into as defined by the Green Paper (Department of Land Reform and Rural Development, 2011). It is also essential for projects (especially those on private lands) to prove that the land is not under any legal ownership challenge or legal processes at the time of project development.

In particular to South Africa's historical and political situation is the issue surrounding land tenure and reform. South Africa faces a number of challenges surrounding its land tenure system. South African legislation recognises four forms of land ownership: private, public, state and communal. The South African Green Paper on Land Reform released in 2011 organises these into a single 4-tier tenure system (Box 6.4.):

Box 6.4. South African 4-tier land tenure system

- (a) State and public land: leasehold.
- (b) Privately owned land: freehold, with limited extent.
- (c) Land owned by foreigners: freehold, but precarious tenure, with obligations and conditions to comply with.
- (d) Communally owned land: communal tenure, with institutionalised use rights.

While the actual risk determination and calculation process is still to be defined and falls outside of the scope of this thesis, it will abide by the same principles that guide the standard. Coupling all these approaches and providing a transparent and efficient permanence determination process will greatly assist all parties involved in understanding the true risk associated with the project and will add integrity to the offsets generated for both potential investors and buyers. Box 6.5 below outlines the proposed permanence approach:

Box 6.5.: Permanence Criteria

Permanence

Project developers are required to submit their risk assessment valuation along with all of the required documentation to the certification body that will allow them to conduct an independent risk assessment evaluation of the project during the validation phase.

- If not satisfied, the project developer can request for the risk assessment process to be carried out by an independent certification body.
- The two risk assessments will then be compared and a contribution to the buffer pool will be determined.
- Permanence will be reassessed at every verification stage and the projects buffer pool account will be adjusted accordingly.

To ensure and determine the permanence of a project, the project must demonstrate a long-term sustainable future. This will be done in three ways:

1) Buffer Pool Approach

The buffer pool approach will follow that of a variable approach. At start up project will be assigned a default contribution to the buffer pool but based on the risk profile and management this will be adjusted accordingly with rebates for risk reductions.

The standard specific risk assessment tool will be developed at a later stage and is not within the scope of this thesis.

The areas to be considered for the risk assessment framework are:

- Management capacity –management staff of the project must have the sufficient experience, qualifications and sound management structure and processes to ensure the success of the project.
- Financial structure – evidence must be given that the project has the project has sufficient capital and cash-flow so as to ensure the sustainable financing of the project.
- Environmental risk – all external environmental risks such as floods, wind, fire, diseases, temperature, animals etc. need to be investigated, assessed and mitigated for risk to the project.

2) Secure Land Tenure

Evidence must be given that the project area has long-term secured land tenure and that it is not under any legal challenge or within a land restitution or redistribution process.

Proof must be provided that all legal permits necessary for project implementation and management are secured over the long term.

3) *PIA*

The project developers have to sign a legally binding PIA with the ‘certification body’, which obligates the retirement of offsets to compensate for partial reversals of GHG reductions and removals.

If a reversal is unavoidable, or not, due to the project developers negligence or intent, then the corresponding amount of offsets will be removed from the projects buffer pool contribution.

If the reversal is due to the project developers’ negligence or wilful intent, e.g. harvesting, livestock reintroduction or land development, then the project developer must retire an amount of offsets equivalent to the amount lost, through either:

Retiring the amount lost from the remaining project offsets; or from purchasing and retiring the offsets of the same vintage from another offsetting project.

Step 4: Public Participation

i. Theoretical background

As has been highlighted in Chapter 3 and 4, public participation is key component of successful and meaningful planning and a key step in precautionary decision making (O’Faircheallaigh, 2010). It has emerged as an essential step to ensure the transparency and credibility of an offsetting project. While involving all stakeholders as participants in environmental and project planning processes is integral to its success, the stringency and extent of consultation and involvement needs to be investigated.

To understand the nature of carbon offsetting projects, especially LULUCF projects, and the public participation processes that are suggested for projects, the projects have to be looked at in context of the processes that govern public participation and land-use and management within South Africa. The National Environmental Management Act (NEMA, Act 107 of 1998) dictates the detailed public participation requirements for all projects during the environmental impact assessment (EIA) process, and if a project requires an EIA then these have to be followed stringently. In most cases landscape restoration projects within South

Africa are granted an exemption from undertaking the EIA process (Powell, 2011, pers. comm.). As a result they do not need to undertake any form of legal public participation process. It is for this reason that the proposed South African voluntary carbon standard will include its own public participation requirements to ensure that the views and opinions of stakeholders are taken into account in the project design and validation phases. In the design of an effective public participation process it is vital to understand and incorporate the projects and projects participant's geographical, social and historical context (Beierle and Crayford, 2002). It is central in this sense to understand the public participation difference between projects on private and public land and the extent of stakeholders' participation in these differing projects.

Land tenure rights in South Africa are a complex and challenging issues, especially surrounding the distinction and debate around communal owned land (Sjaastad and Cousins, 2008). Taking these complexities into account is important in the development a South African voluntary carbon standard as the form of land ownership and tenure will fundamentally affect the land on which a landscape restoration project is situated. The easiest distinction to make within the 4-tier tenure system (Box 5.4) is between state and public tenure (a) and private tenure (b and c)

Projects on private and public land in South Africa face different challenges and requirements when it comes to stakeholder engagement and consultation. This is best illustrated with a hypothetical situation to place the issue into context, especially with regards to a project on private land. Landscape restoration is a potentially new form of economically productive (as a result of potential income generated from the carbon markets) land-use and as such can be seen as being in competition with other agricultural land use types on private land. If a landowner is currently engaged in agricultural activities, i.e. crop farming, and decides to change the crop produced, they do not need to enter into an extended public and stakeholder engagements process under South African regulations. It is argued that landscape restoration projects for the purpose of carbon 'farming' fall into this same category. Thus, on private land under the proposed standard, there should be no need to undertake an extensive and costly public participation and stakeholder consultation process.

Projects on public or state owned land are different however, as by definition they require extensive and comprehensive inclusion of all stakeholders and public participation in the decision making process, but they still have a recognised body responsible for managing the

land. The other form of public ownership is communal land tenure. South Africa has had historical challenges surrounding this, and is highlighted by the nullification of the Communal Land Rights Act (Act no. 11 of 2004) by the constitutional court of South Africa. The complexity involves the institutionalised use rights of communal land and, as a result, the complexity of determining ownership or control of the land when there are a wide variety of stakeholders are involved (Sjaastad and Cousins, 2008).

ii. Standard Process

Current voluntary carbon standards have generally outlined and required the same public participation approach for projects on both private and public land without consideration for communal land. While public participation has been incorporated into some of the current voluntary standards it has been done in varying degrees. The GS has outlined an extensive public consultation process that allows for both a local and global consultation requirements, while the VCS follows the requirements set out in ISO 14604 – 2. Other standards such as SC require the co-benefits data to be collected in a participatory manner, and thus ensuring effective stakeholder engagement. It is a combination of these that will be incorporated and used for the public participation process in a proposed South African voluntary carbon standard. Key and unique to the development of this public participation process will be the distinction between projects on private, public and communal land. Distinguishing between these forms of land ownership within a local stakeholder consultation process context brings with it its own challenges, and as such a local stakeholder needs to be defined for each.

The definitions for stakeholders within each context are different, as private land can have a much narrower focus of stakeholders than project on public and it is for this reason that the definitions need to be adjusted. In the voluntary carbon standards context a *local stakeholder - private land*, which is adapted from Post et al. (2002), can be defined as: ‘the participants and individuals that contribute to, or are, involved directly in a projects activities and are therefore its potential beneficiaries and/or risk bearers’. The definition for *local stakeholders - public land* is much broader than the previous definition and incorporates stakeholders that are both directly and indirectly affected by the project. Therefore in the context of the proposed voluntary carbon standard local stakeholders - public land can be defined as: ‘the participants, individuals, constituencies and communities who are directly or indirectly affected by the projects activities and are therefore the potential beneficiaries and/or risk bearers.’

While there is some direction being provided by the South African government regarding the determination of communal land tenure rights, it is an area that will need to be addressed in the future development of the proposed standards public participation process. For the purpose of this thesis, communal land will be addressed within the ‘Public Land’ section of Box 6.6.

Box 6.6. Public Participation Criteria

Public Participation

- Public participation differs in terms of a) Private land and b) Public land. Within both of these there are requirements will be for both a local and national stakeholder consultation process.
- A comprehensive local stakeholder process has to be conducted (for both private and public land) if national laws require it. In case no legal requirement exists, the following is required:

a) Private Land

- Local stakeholders (as defined by *local stakeholder-private land*) need to be identified and informed during the PDD development phase regarding the nature of the project, its broader goals, timelines and the phases of the project. Questions and comments arising from this process need to be recorded and the responses reported in the PDD.
- Local stakeholders also need to be consulted during the SD benefits baselines, monitoring and assessment phases (where required) and recorded in the RDD or annual reports.

National Stakeholder Consultation

- At the validation phase, the RDD will be published online for 30 days before validation to allow for broader stakeholders to comment; these will be documented and used to assist during the validation phase.

b) Public Land

- Evidence of a comprehensive process to identify all local stakeholders (as defined by *local stakeholder – public land*) and that an adequate process has been undertake to

inform all stakeholders during the RDD development phase regarding the nature of the project, its broader goals, timelines and the phases of the project.

- An open space and opportunity for local stakeholder to pose questions and comments to the developer arising from this process. These need to be recorded and the responses reported in the RDD and the annual reports.

Local stakeholders also need to be consulted during the SD benefits baselines, monitoring and assessment phases (where required) and recorded in the RDD and annual reports.

National Stakeholder Consultation

- Prior to the validation phase, the RDD will be published online for 30 days to allow for broader stakeholders to comment; these will be documented and used to assist during the validation phase.

Step 5: Project Validation

i. Theoretical Development

Validation is the first part of the auditing process and aims to ensure that a projects offsets are real, reliable and permanent. The main aim of this stage is to confirm that all aspects of the project have been planned for before implementation and that potential pitfalls and contingencies have been identified. This step involves critically analysing all the documents and data presented in the PDD, before a project has been implemented and aims to confirm that a project has complied with standards' certification standards procedures, rules and regulations. Deaton et al. (2010) defines a third-party certifier as a private or public organisation responsible for accessing, evaluating and certifying quality claims based on a set of standards and compliance methods. Within current voluntary carbon standards it has become the role of standard accredited third-party auditors to perform this function. Hatanaka et al. (2005) argue that private standards, such as voluntary standards are ineffective without adequate enforcement mechanisms. Third-party auditing and validation has emerged as the key institution for this that is both independent from project developers and governments (as it is a private, non-regulated transaction). It has been argued that the appointment of a third-party certified increases legitimacy through an independent, unbiased, expert-driven evaluation of the projects development and processes (Hatanaka, 2005).

The use of third-party auditors within certification standards is not without its critics and negatives. These have been identified from the analysis of existing certification schemes in section 4.4.4. The main pitfall and negative has been associated with utilising different third-party auditors for different projects under the same standard. In this case the auditor's subjective interpretation, understanding and application of the standards rules, procedures and processes will differ, even slightly, leading to a differing judgement and assessment of the project. This process could lead to the unfair acceptance or rejection of projects based. The second criticism is the cost implications associated with obtaining a third-party auditor. Krey (2005) found that validation costs constitute the main share of the transactions costs involved in a CDM project, ranging from US\$ 6,000 – US\$ 80,000. The costs vary as validation generally depends on the projects complexity and size (Krey, 2005). In a developing countries context, such as South Africa's, these are a major consideration in the development of a project. Since the majority of the certified auditors for the various voluntary carbon certification schemes are situated in the global north, it adds large costs to obtain their auditing services for projects within developing countries. To address this issue the development of the standard focuses on reducing the major costs components, of which validation is key one.

Current voluntary carbon standards have generally failed to address these issues of subjectivity and transaction costs, through utilising the *status quo* of third party validators and certifiers. These are crucial issues to address so as to encourage the adoption of a proposed South African Voluntary carbon standard. Through providing a stringent and thorough certification process at a cost competitive rate will make the standard more attractive to potential project developers. CarbonFix has developed and pioneered a new model of pre-validation which is conducted by the CarbonFix Technical Board. Projects submit all their documents to the CarbonFix technical board which evaluates whether the project is likely to meet the standards criteria. This process of internal validation aims to reduce both costs and time through a rapid assessment to identify any project pitfalls. However, CarbonFix still requires a comprehensive third party certification process, with the associated costs, and only uses pre-validation as a screening process. To fully reduce transaction costs and subjectivity this process needs to be refined.

ii. Standard Process

The proposed process for a South African voluntary carbon standard aims to increase efficiency and cost-effectiveness for the certification of projects and internalising the project validation process into the certification body is a crucial step to achieve this. The internalization of the validation process will allow for an objective assessment of a project and how it conforms to the criteria of the standard. It is argued that the integrity and legitimacy of the certification process will still remain intact as the validation process is inherently associated with assessing the project development process based on the certification guidelines. The certification body is perfectly suited to make these judgements as the designers and custodians of the standard. While it might be argued that the standard will benefit from validating all projects that apply, due to increased revenue in the short term, it is the long term outcomes that will act as a regulating mechanism for stringent and objective evaluation by the standard body. Integral to the standards success and longevity is the reputation and trust associated with the eco-labels integrity. It is imperative that the certification body maintains the image of the standard to be one of trust and integrity for both investors in projects, consumers of the offsets that bear the mark and for project developers. If the standard validates projects that do not meet the standard requirements it will lead to an erosion of the trust in the brand name in the long term through potential project failure and in turn a failure for the reputation of the carbon standard.

Box 6.7. Validation Process

Validation Process

It is envisioned that the validation phase will take six months from the submission of all the required documents. During this process the project will be evaluated against all the project criteria outlined in the standard. To validate a project there will be a series of:

- Desktop reviews, field visits and interviews.

Following the completion of the validation phase, a project will be given either:

- a) A validation certificate indicating that the project has complied with the certification requirements; or
 - b) A list of corrective action requests
- The project developer can then either:

a) Comply with the requests and subsequently alter the project, or

b) They can appeal the corrective action requests.

- If an appeal is lodged then a third party auditor, that is appointed by the standard (at the costs of the project developer), will conduct an independent project validation.
- To gain certification the project is required to abide by any corrective action requests stipulated.

This is a unique process developed for the South African voluntary carbon standard. It allows for a local, cost effective and efficient validation process while still integrating a third party auditing component. This validation process will be a critical area for the proposed South African voluntary carbon standard to both increase efficiency and reduce costs.

Step 6: Registry

The use of a registry for the tracking and identification of project specific offsets is a crucial process in the transaction of credits. There is currently no single registry for all credits, however they all function similarly. In this case there are two paths for the proposed South African voluntary carbon standard certification body to investigate. The first path is the use of an existing registry, such as Markit (<http://www.markit.com/en/products/registry/markit-environmental-registry.page>). The second path entails developing a standard specific registry on which all credits from projects using the standard are registered and traded. While the development or choice of registry is not within the scope of this thesis, it is recognised as an essential component of the final certification development.

Step 7: Field Verification

i. Theoretical Development

Field verification is the second component of the carbon offset project auditing phase. It involves confirming that the project is performing to its projected outcomes. It aims to confirm the actual emissions offset from a project and assesses and monitor the SD benefits of a project. Crucial to this phase is the use of field visits and the independent measurements of the carbon offsets and SD benefits. Field verification is a key regulatory process to ensure the oversight of a project (Hatanaka et al., 2005) and in turn the legitimacy of a project's claims. This traditionally has been conducted by third-party auditors at differing time scales

and frequencies as determined by the standard, e.g. VCS only requires one field visit during a project's life time, while others require a visit up to every five years during a project's lifetime. It has to be noted that the increased frequency of field verification visits increases the associated costs for the project and thus there is an inherent trade off through ensuring integrity of a project's claims and the associated costs for projects.

ii. Standard Process

For landscape restoration projects, there is in general, a lag time between project implementation and a viable amount of offsets produced. In recognising this field verification is not required within the first year of project implementation. To ensure that a project is abiding by its agreed and certified PDD and that the correct amount of carbon offsets and SD benefits are being generated, the verification process will be undertaken by either the certification body, or a third-party auditor accredited by the certification body. To ensure the continued verification of a project, throughout its lifetime, it is suggested that the following field verification process is followed in Box 6.8:

Box 6.8. Field Verification

Field Verification

The following rate of field verification is required:

- Initial certification – within 2 years of project start date.
- Fixed certification – every 5 years after the initial certification.

To ensure that a project remains on course and within the framework of the PDD, the project developer will be required to submit a progress report every year (after the initial certification process) that a project does not undergo field verification. This report will have to include information such as:

- Area planted in the year as well as survivorship stats.
- Offsets generated that year.
- Offsets sold and serial numbers of these offsets.
- Any reversals, extent of such reversals and description of why and how.
- New planting areas, if any, to be certified.
- SD benefits reporting (Outcome Indicators).

- These progress reports will be made available to all stakeholders and will increase transparency within the project as well as assist in the field verification process.

6.4. Conclusion

The proposed standard incorporates and simplifies a number of currently considered complex and limiting approaches. A main feature of the standard is the simplification of the RDD process through the establishment and requirement of the submission of a detailed, robust RIN document that will be used to compliment the RDD. This will serve a scoping phase in order to determine project eligibility before the costly RDD is developed and submitted. This will allow for the simplification and focus of the RDD on the actual project design through reporting on the requirements surrounding the actual baseline calculations of carbon and SD benefits. The process is also streamlined through using the simplified additionality determination process, through providing an amalgamation of permanence determination approaches and the use of local specific leakage requirements.

The second key approach to this standard is the incorporation and focus of the proposed standard to ensuring the generation of net SD benefits and placing them at the same level as carbon within the RDD design and project development validation and verification. The full and effective integration of these has been missing within current fully fledged voluntary carbon standards, as they often rely on a mixture of project design standards to achieve this. Offering the inclusion of all components into one standard, specifically designed for South Africa, will not only assure SD credentials but also increase the transparency and understanding, and reduce costs.

The revised public participation approach that distinguishes between private and public land is also key to the reduction of costs and aims to inform stakeholders and involve them in the evaluation and monitoring of co-benefits, while keeping down costs for private land developers. Crucial to the success of this standard is the reduction in both physical and opportunity costs for South African offset projects, as such it is determined that this simplified process will contribute to this. Integral to this is the reduction of costs associated with activities such as validation and verification and thus the emphasis on local, standard based validation and verification.

While non-essential criteria such as project location (only in South Africa) and project types (only landscape restoration) have been addressed throughout this section, more focus will be needed to be put on these areas and others such as ensuring transparency and the detailed costs of certification to make the standard truly viable and marketable.

While not every issue or area is, and can be addressed in this initial proposal of a South African voluntary carbon standard. It has not been designed to achieve this, rather it has been designed to detail the thoughts and ideas that could be contained within a proposed standard. This can then be used as a basis to communicate with, gather opinion and open debate with a structured approach surrounding the major ideas and processes. It is anticipated that the processes outlined within this chapter will contribute to lowering the cost of certification within South Africa and also reduce the certification timelines. It is also hoped that these proposals outline above will maintain the integrity of offsets certified under the proposed standard. It is envisioned that combining these proposals and that off the SD assessment framework in Chapter 5 that offsets certified are recognised for their SD and environmental integrity and are additional, real, reliable, and permanent.

While the proposed South African voluntary carbon standard is nowhere near completion or final acceptance, this process has highlighted the position and path that it is envisioned to take. The development of this preliminary draft 'straw dog' standard has explored and interrogated some of the essential components of current voluntary carbon certification standards and altered, simplified and applied and adapted them with the aim to allow them to work more efficiently within South African conditions. If the standard is ever to be truly operationalized there is need for significant debate surrounding the contents of this proposal, as well as the indicators obtained within the SD indicator framework outline in Chapter 5.

Part 3:

General Conclusion

Chapter 7:

General Discussion, Research Implications and
Conclusion

7.1. Voluntary Carbon Markets and the Development of Standards

A substantial amount of time has passed since the first voluntary carbon market deal through the initiation of the AES tree planting project. After this the notion of climate change, carbon offsetting and trading has become mainstream within global political and market rhetoric. It has spawned the development of many market players and the institutionalisation of carbon offsetting and trading within the global sphere amongst business leaders, political decision makers, economists and scientists. This has led them to become a key mechanism within the KP, through the CDM and JI, and potentially within any future global, legal, binding commitments to GHG reductions.

The carbon market however has become distorted and confused by the dual path it has taken to development, with the mandatory and voluntary markets both playing similar but different roles. The uncertainty that currently exists amongst mandatory market participants surrounding the future of the post 2012 climate negotiations, various countries' GHG reduction commitments and the KP has led to a decline in confidence in the role of carbon markets. This is coupled with political impasse in the globe's two largest and most influential economies and GHGs emitters, that of the USA and China, and persistent economic turmoil and hardships has led to a stalling and decline of the value of the CDM market at US\$ 142 billion in 2010 (Linacre et al., 2011). In contrast the voluntary market registered its highest ever volume of trade in 2010 with 131.2 Mt CO₂e, which is a 34% increase from 2009 (Peters-Stanley et al., 2011). In value terms this is US\$ 424 million, with the majority of trade taking place in the OTC market.

Carbon credit supply has been largely dominated by developing countries especially members of the new BRIC countries (Brazil, Russia, India and China) in both the CDM and voluntary markets. This has however historically been mainly from HFC-23 projects in the CDM and EU ETS, and methane destruction and renewable energy projects in the voluntary market (Hamilton et al., 2010). This however has changed within the voluntary markets of late and in 2010 land-based projects supplied the largest volume of credits. This has been stimulated from increased recognition, market signals and commitments to developing and eligibility of these land based projects in global markets. While these project types are still not explicitly acknowledged or purchased within mandatory markets they have found a home within the voluntary markets and amongst voluntary carbon standards. Project types such as landscape restoration and REDD plus have been the major drivers of growth for the voluntary

market and have gained prominence due to their environmental integrity and contribution to sustainable development. This growth has also facilitated the development of new project methodologies specifically focussed at land based projects, such as the VCS REDD methodology and the refinement and applicability of a number of other methodologies. This trend has also seen the increasing emergence of geographic-specific and project-specific voluntary carbon standards such as Brazil's Mata Viva (BMV) and China's PS, which were both formally released in 2010.

These standards are tailored to close the loop between local supply and demand but also to ensure the sustainable development contributions of projects within their countries. They are not a new concept with the USA (having a version for a while), but they have been refined with the continuing developments within the voluntary market. This trend of embedded standards is now being accelerated by the developments taking place in some of the largest developing countries (China and Brazil), and in both cases they initially focus their methodologies on land based project. These countries have realised the potential to capitalise on the sustainable development benefits from LULUCF carbon offsetting projects, but also ensuring the development of a suitable standard which will allow a country can to unlock local capital and channel funds from local purchasers to local projects. This does not exclude international investors in the projects but the local embedded standards aim to offer local purchasers the increased incentives from buying and investing in local offsets. This is evident in that nearly all the offsets produced by projects certified under the local standards (BMV or Panda Standard) were sold to local investors in Brazil or China respectively (Peters Stanley et al., 2011).

7.2. The Development of a New Voluntary Carbon Standard – Is It Muddying the Waters?

In 2007 the development of the current voluntary carbon standards were spurred by a global regulatory vacuum (Gillenwater et al., 2007). This has seen the rise of a variety of competitors in the marketplace and increased confusion for both project developers and purchasers around the standards and what they contain and purport to achieve and do. The voluntary carbon market is still attempting to establish itself as a recognised force in global carbon markets that can provide secure, legitimate and long term offsets in to a market. There has been a marked division between standards that focus purely on carbon offsets and those that incorporate sustainable development benefits. These variations and applications are all the signs of a developing market, and due to its young age this can be expected and should not be derided.

To date however not one standard has managed to answer and address the three main challenges of certification; 1) project eligibility and additionality; 2) monitoring and third party verification procedures; and 3) enforcement of ownership (especially on public land).

This has led to not a single dominant standard, but rather a variety of large standards (VCS, CCBS and GS) that fluctuate in market share due to the development of new methodologies, certified projects and political direction. These standards have however gained initial acceptance due to their affiliations with large market players or organisations such as the WEF (who support the VCS) or WWF (who support the GS). This gave these standards the initial impetus to establish themselves as dominant recognised players in the market, even though they do not necessarily encompass the best practices, most effective or cost efficient certification procedures. There has been confusion within the marketplace surrounding the ‘best’ standard and this has served to alienate some potential consumers of certified offsets.

Current voluntary carbon standards are by no means perfect and more work is needed into the critical evaluation of a projects submitted PDDs and the successful comparisons and evaluation of compliance with the original standards baseline requirements, especially with standards that do not require independent long term field verification (such as the VCS). While the markets and standards are still evolving and developing with new projects and methodologies arising yearly, if not quarterly, there still has not been enough time for many of the standards to prove their effectiveness and practicality. This is especially relevant in project types such as landscape restoration that have lag times from project implementation to offset generation and the variety of SD benefits that they can provide.

Gillenwater et al. (2007) argues that environmental commodity markets are inherently more susceptible to market failures than traditional markets because the commodity, in this case carbon, is both intangible and a public good. Without clear standards for quality assurance competitive pressure will force sellers to minimize quality and limit transparency. This has been evident in the initial stages of the voluntary carbon market development and introduced large amounts of distrust that have followed the market in its growth. It is for this reason that standards need to continue to innovate and understand the role they play and that of others in the market. Failure to capitalise and build knowledge around new, robust ideas and the streamlining of existing processes will result in the failure of the market through inducing a stagnation and lack of trust in certified offsets, or through the certification of projects that fail to meet the aims and requirements of the market.

The lack of development and acceptance of many of the existing standards in developing countries, especially within Africa, is a clear market signal that innovation is needed to overcome these stumbling blocks. If a new voluntary carbon standard is developed without this in mind and aims to compete with the large global voluntary standards at that scale it will serve to confuse the marketplace even more. But the development of smaller scale, embedded standards can be effective at overcoming these challenges and creating local level markets within areas where the broader, larger standards have been less effective or non-existent, such as South Africa. Tailoring these voluntary carbon standards and the certification procedures to local level conditions will not only provide the standard with more legitimacy, credibility and cost-effectiveness to local level offset producers but also greater monitoring and assurance of credits for local offset purchasers as well as adding assurance for corporate social responsibility buyers.

7.3. Voluntary Carbon Standards – Predicted Future Developments

The development of voluntary carbon standards has a vital role to play in the future innovation of third party carbon offset quality assurance mechanisms within both the mandatory and voluntary markets. As the voluntary market develops there will be the inevitable preference of some standards over the others, as was seen in 2009, but in 2010 this was reversed with the prevalence and growth of the various country specific embedded standards. This flux has been brought about by the continued competition amongst individual voluntary carbon standards for market share, particularly around the development and certification of new methodologies and project types. Uncertainty also exists around the various voluntary carbon standards and their potential role in a post-2012 regulatory climate change landscape and also in various other mandatory carbon trading schemes, such as pre-compliance purchasing under the proposed California Cap and Trade System (ARB 32) (California Air Resources Board, 2011), even though participants can not currently purchase offsets produced outside of the USA.

It is inevitable that the voluntary market will eventually select one or a number of the standards as preferential and that these will take the lead and continue, in the future, to evolve and develop more robust certification processes and procedures. The current standards are not in that position currently and this critical assessment, especially through identifying current standard best practices, of their components and their development are highly relevant and vital to the continued improvement and streamlining of current standards and the

development of a potentially new one. It is envisioned with the continued development of the voluntary market and the increasing evidence of a standard's robustness and effectiveness will in future guide and contribute to the development of any potential future mandatory mechanisms or see voluntary standards eligible within the mandatory markets. These voluntary standards also have the potential to become more recognised and incorporated into developing mandatory market frameworks, especially surrounding the bureaucracy and costs associated with CDM certification.

It is anticipated that the voluntary carbon markets will take a similar path to sustainable forestry management certification, especially the PEFC process. That is to say that the voluntary market will see the increased development of standards focussed within a particular geographic location but in the near future will be organised under an umbrella organisation that ensure that all standards abide by an overarching set of principles and aims. This will allow for the standards to still focus on developing efficient and effective local level certification processes and ensuring the certification of legitimate carbon offsets and sustainable development, but also gain legitimacy in global markets through being recognised by their association to a global body with recognised aims and principles.

7.4. Developing the South African Voluntary Offset Market

The concept of embedded standards has opened up a new and exciting path for the development of the voluntary market and the proposed South African voluntary carbon standard aims to capitalise on this development. A project in a specific country faces differing challenges to obtaining certification than other projects in other locations, and South Africa is no different. This is evident in the lack of current certified voluntary offsetting projects and the limited participation in the mandatory market. While there are a number of local level South African examples, such as Elemental Equity (<http://elementalequity.org/>) and Food and Trees for Africa (www.trees.co.za), these are informal and there is no independent guarantee of the integrity of the offsets generated and sold. These challenges to certification relate to a variety of institutional, economic and political barriers that have limited South Africa's access to a share of the global carbon markets through the supply of credits to the markets.

The South African market for carbon offsets however is poorly developed, with the majority of carbon offset purchases being from foreign sources due to a lack of a local supply of

offsets. The participation of South African companies in carbon offsetting has been limited but there is some scope for investment and a willingness to purchase certified credits from South African projects. The development of a voluntary carbon standard has the potential to act as this ‘market making’ intermediary in South Africa.

7.5. Conclusion - Future of the Proposed South African Voluntary Carbon Standard

The work undertaken within this thesis has served as a critical evaluation of the development of the voluntary carbon market and in particular the development of the various voluntary carbon standards, with a particular focus on LULUCF and landscape restoration projects. This thesis has served to contribute to the main facets of voluntary carbon standard development through: 1) a critical analysis of voluntary carbon standard development and current market best practices; and 2) the development of new and innovative processes for a proposed South African voluntary carbon standard. This has been centred and demonstrated within the initial goal of developing a preliminary ‘straw dog’ voluntary carbon standard aimed particularly at certifying landscape restoration projects within South Africa. Central to this notion has been ensuring the sustainable development benefits of projects and hence the focus on the development of SD indicators and the IOOI framework in Chapter 5 and 6.

While the proposed carbon standard has focused on certifying landscape restoration projects within South Africa, it cannot be the only project type accepted if the standard is to be truly viable. While the basic building blocks of the standard have been developed there needs to be increased development of new baseline methodologies from other areas, especially REDD plus and renewable energy projects that can be accepted within the standard and thus allow it to diversify away from landscape projects and become more competitive. A lot of work and time has been spent on developing the baseline methodologies for landscape restoration projects within the subtropical thicket biome of the Eastern Cape, South Africa (Powell, 2009) and these are primed to be the first initial methodology accepted under the standard if it is developed further.

A significant investment, especially in terms of time, has been put into generating the ideas and knowledge contained within this thesis. This proposed voluntary standard contained in Chapter 6 is, however, nowhere near a viable standard for practical application as yet; it needs a lot of focus on mainstreaming the standard and the processes. This will be achieved in part through gaining wider stakeholder input and support for the standards principles, aims

and content of the standard. Without the buy-in from a variety of local stakeholders and a champion to drive the future development process the ideas and objectives contained within this thesis will falter at this hurdle and remain in concept form only.

The trade of carbon offsets within South Africa cannot however be seen as a panacea to reversing landscape degradation and moving towards a 'green' economic growth path, but it is one option to changing the current economic systems to focus on the benefits of environmental goods and services. The development of a local, embedded voluntary carbon standard can significantly enhance this process and ensure that the 'greening' of South Africa's economy is done internally and that vital funding is channelled to certified carbon offset projects that directly contribute to building sustainable development within South Africa.

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