An international market for protected area certificates and its potential to attract private sector investment

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Zusammenfassung

Die biologische Kapazität der Erde ist begrenzt (Rockström et al., 2009). Was auf den ersten Blick einleuchtend erscheint, wird seit Jahrzehnten ignoriert. So verbraucht die Menschheit mehr natürliche Ressourcen, als die Erde regenerieren kann (Ewing et al., 2010). Dies führt nicht nur zu einer Veränderung von Ökosystemen und dem damit verbundenen Verlust an biologischer Vielfalt und natürlichen Leistungen im Bereich der Versorgung, Regulierung, Kultur und unterstützenden Dienste, sondern hat auch schwerwiegende Folgen für das menschliche Wohlbefinden (Duraiappah und Naeem, 2005; Jax, 2010; Mainka et al., 2005).

Eine Lösung zur Reduktion der anthropogenen Auswirkungen auf Ökosysteme ist die Entwicklung von Schutzgebieten (Bertzky et al., 2012; Duraiappah und Naeem, 2005). Derzeit gibt es mehr als 210.000 Schutzgebiete weltweit, die von streng geschützten Flächen ohne jegliche menschliche Intervention, bis hin zu Naturschutzgebieten und solchen Flächen reichen, die der nachhaltigen Nutzung natürlicher Ressourcen dienen; und ihre Anzahl und Größe steigt kontinuierlich (WDPA, 2014). Die finanziellen Mittel reichen jedoch oftmals nicht aus, um die bestehenden Standorte nachhaltig zu führen, geschweige denn neue Schutzgebiete aufzubauen (Balmford et al., 2002; Emerton et al., 2006). Insbesondere in Entwicklungsländern fehlt Kapital, um dem Kostendruck von Erhaltungsmaßnahmen zu begegnen (Balmford et al., 2003). Um die überwiegend aus Staats- und Spendengeldern bestehenden Mittel zu unterstützen und neue Investitionsquellen zu generieren, liegt es nahe, auch über das Engagement des privaten Sektors nachzudenken.

Heutzutage nimmt die Umweltverantwortung eine innovative Rolle in der Entwicklung von Unternehmensstrategien ein (Esty und Winston, 2009; Laszlo, 2008; Winn und Pogutz, 2013). Wenn es um den Aufbau und das Management von Schutzgebieten geht, ist das Engagement privater Unternehmen allerdings stark begrenzt (Emerton et al., 2006). Das bedeutet nicht, dass Unternehmen keinen Nutzen aus Ökosystemen ziehen. Pharmaunternehmen gewinnen zum Beispiel natürliche Arzneimittel und Biochemikalien aus gesunden Ökosystemen. Samen- und Zuchtunternehmen hängen von der Existenz genetischer Ressourcen ab und das Geschäft der

Tourismusbranche ist auf Biodiversität und landschaftliche Schönheit angewiesen (Hanson et al., 2012; Lambooy und Levashova, 2011). Entsprechend der Idee der Zahlungen für Ökosystemleistungen (payments for ecosystem services - PES) sollten diese Unternehmen einen Anreiz haben, Grundbesitzer für die Vorteile zu bezahlen, die sie aus bestimmten Landbewirtschaftungsmaßnahmen ziehen (Karousakis und Brooke, 2010; Wunder, 2005). Warum sind private Investoren dennoch so zurückhaltend, wenn es um die Bereitstellung signifikanter Mittel für internationale Schutzprojekte geht?

Um diese Frage zu beantworten, muss berücksichtigt werden, dass es sich bei vielen Ökosystemleistungen um öffentliche Güter handelt, die durch Nicht-Rivalität und Nicht-Ausschließbarkeit gekennzeichnet sind (Pascual und Muradian, 2010). Dies führt zu dem Problem, dass Unternehmen, die in Schutzgebiete investieren, nicht nur den resultierenden Nutzen teilen müssen (positive externe Effekte), sondern weiterhin auch durch die Erschöpfung ökologischer Ressourcen durch andere Marktteilnehmer beeinträchtigt sind (negative externe Effekte) (Tietenberg und Lewis, 2012). Diese externen Effekte sind für das Investitionsverhalten von Unternehmen von entscheidender Bedeutung, da sie die Basis für das Trittbrettfahrerproblem darstellen (Barrett, 2007). Umweltabkommen (environmental agreements - EAs) zielen darauf ab, solche sozialen Dilemmata zu überwinden. Unternehmerische EAs, die es Firmen ermöglichen, globale ökologische Herausforderungen gemeinsam zu bewältigen, finden bislang jedoch kaum Beachtung in der Literatur.

Im Allgemeinen ist wenig über die Angebotsseite von Finanzmitteln für den Erhalt von Ökosystemen sowie über die Chancen und Risiken entlang der Wertschöpfungskette für Schutzinvestitionen bekannt (Credit Suisse et al., 2014). Aktuelle Studien betonen allerdings, dass aus Sicht der Anleger der monetäre Nutzen und die aus der Erhaltung von Ökosystemen generierten Vorteile nicht genügend identifiziert und standardisiert sind und insgesamt zu wenige verkaufsfähige Schutzprojekte existieren (Credit Suisse et al., 2014; WEF, 2013). Die Verifizierung und Zertifizierung sozialer und ökologischer Projekterfolge durch einen unabhängigen Dritten könnte demzufolge die Zurückhaltung von Investoren verringern (Bayon, 2004; Karousakis und Brooke, 2010; Kate et al., 2004).

Bei der Zertifizierung von Landflächen handelt es sich nicht um ein neues Konzept (Dudley, 2003; Sperling und de Kock, 2010). Allerdings steht die Entwicklung internationaler Märkte für Landzertifikate noch am Anfang und bedarf weiterer Forschung sowie empirischer Daten durch Pilotprojekte (Carius, 2012; Parker et al., 2009; Vorhies, 2013). Um zur aktuellen Diskussion über globale Zertifizierungssysteme für Landflächen beizutragen, hat diese Dissertation zum Ziel, einen internationalen Marktplatz für Schutzgebietszertifikate (protected area certificates - PACs) im Hinblick auf die Generierung privatwirtschaftlicher Investitionen in die Nachhaltigkeit von Ökosystemen zu untersuchen. Dazu werden die folgenden zentralen Fragen addressiert: (1) Welche Auswirkungen haben unternehmerische EAs auf Investitionen der Privatwirtschaft, wenn es um die Zertifizierung von Schutzgebieten geht? (2) Welche Motive haben Unternehmen einen freiwilligen Beitrag zum Schutz und zur Erhaltung von Ökosystemen zu leisten? (3) Welche Gestaltungsgrundsätze sind für landbasierte Zertifizierungssysteme unabdingbar, um Investitionen aus der Privatwirtschaft anzuziehen? (4) Besitzen landbasierte Zertifizierungssysteme das Potenzial eine 'win-win'-Lösung sowohl für private Investoren aus Industrieländern als auch für Interessengruppen aus Entwicklungsländern zu erzeugen?

Um die Auswirkungen unternehmerischer EAs auf privatwirtschaftliche Investitionen in zertifizierte Schutzgebiete zu analysieren, beginnt Kapitel 2 mit der Entwicklung eines nicht-kooperativen Koalitionsspiels. Im Modell haben Unternehmen nicht nur die Möglichkeit, PACs zu kaufen und ihre Produkte entsprechend auszuweisen, sondern auch einer Koalition beizutreten, die ihre Mitglieder verpflichtet, finanzielle Mittel für zertifizierte Schutzgebiete bereitzustellen. Die unternehmerische Abhängigkeit von Ökosystemen wird über den ökologischen Fußabdruck modelliert. Unter Berücksichtigung der über Rückwärtsinduktion ermittelten teilspielperfekten Nash Gleichgewichte zeigt das Modell, dass Anreize zum Trittbrettfahren durch die Zertifizierung von Umweltinvestitionen reduziert werden und unternehmerische EAs die individuellen Kosten für Umweltschutzmaßnahmen senken. Durch die Implementierung von Seitenzahlungen, die Beschränkung der Mitgliederanzahl und die Einführung von Strafzahlungen bei Fehlverhalten können nachhaltige Koalitionen gebildet werden, welche die Auszahlungen sämtlicher Koalitionsmitglieder sowie das

Wohl der Gesellschaft steigern. Die Ergebnisse werden durch eine Sensitivitätsanalyse für die deutsche Tourismusbranche in Sansibar, Tansania gestützt.

In Kapitel 3 und 4 werden teilstrukturierte Experteninterviews genutzt, um die PAC Nachfrageseite weiter zu erforschen und empirische Daten für die Investitionsbereitschaft privater Unternehmen zu erheben. Insgesamt wurden 39 Interviews mit Vertretern deutscher Unternehmen geführt, die als Experten auf dem Gebiet der ökologischen Nachhaltigkeit gelten. Die dargestellten Ergebnisse basieren auf der Triangulation quantitativer und qualitativer Methoden. Während sich Kapitel 3 auf die Identifizierung von Hauptmotiven für unternehmerische Investitionen in den Schutz und den Erhalt von Ökosystemen konzentriert, beschäftigt sich Kapitel 4 vor allem mit der Definition von Produkt- und Marktanforderungen durch potenzielle Investoren aus der Privatwirtschaft.

In Kapitel 3 werden durch die Ergänzung der explorativen Faktorenanalyse mit der qualitativen Beschreibung von PAC Marktchancen und -risiken, drei Hauptmotive als von besonderem Interesse für die unternehmerische PAC Nachfrage identifiziert: direkte finanzielle Vorteile, die soziale Legitimierung des Geschäfts und die unternehmerische Abhängigkeit von Ökosystemen. Dabei wird angenommen, dass die Abhängigkeit von Ökosystemen den stärksten Einfluss auf die PAC Nachfrage hat. Basierend auf den identifizierten Hauptmotiven verwendet Kapitel 4 ein zweistufiges Clusterverfahren, um strategische Investorengruppen zu identifizieren. In Kombination mit der quantitativen und qualitativen Beschreibung von Produkt- und Marktanforderungen werden sieben Gestaltungsgrundsätze ermittelt, die freiwillige Investitionen aus der Privatwirtschaft fördern. So gaben etwa 40 Prozent der Experten an, dass ihr Unternehmen bei entsprechender Gestaltung PACs kaufen würde.

Abschließend bewertet Kapitel 5 kritisch, inwiefern ein Markt für PACs das Potenzial hat, eine ‘win-win’-Lösung sowohl für private Investoren aus Industrieländern als auch für Interessengruppen aus Entwicklungsländern zu erzeugen. Die PAC Nachfrageseite wird auf Basis der Experteninterviews mit Vertretern deutscher Unternehmen beschrieben. Die Angebotsseite wird anhand der Befragung von 26

Schutzgebietsexperten sowie Entscheidungsträgern in Tansania untersucht. Durch die Kombination der Ergebnisse beider Studien werden zwei Herausforderungen als wesentlich für den fundierten Aufbau eines PAC Marktes identifiziert. Erstens sollten Schutzgebiete Effizienzziele und nicht die Armutsbekämpfung fokussieren, um für privatwirtschaftliche Investitionen in Frage zu kommen. Zweitens ist es erforderlich, dass die politischen und institutionellen Bedingungen in potenziellen PAC Anbieterländern das Investitionsklima verbessern, indem Bürokratie, Misswirtschaft und Korruption reduziert werden.

Schlagwörter: Schutzzonen, Zertifizierung, Zahlungen für Ökosystemleistungen, Investitionsbereitschaft, Nachhaltigkeit von Ökosystemen, Tansania

Abstract

The biological capacity of the earth is limited (Rockström et al., 2009). While this is obvious at first glance, it has been ignored for decades and mankind has consumed more natural resources than the earth has been capable to regenerate (Ewing et al., 2010). This leads not only to a continuing conversion of ecosystems characterized by biodiversity loss and degradation of provisioning, regulating, cultural and supporting services but also has severe impacts on human well-being (Duraiappah and Naeem, 2005; Jax, 2010; Mainka et al., 2005).

One solution to reduce the anthropogenic impacts on ecosystems is the development of protected areas (Bertzky et al., 2012; Duraiappah and Naeem, 2005). Currently, there are more than 210,000 protected areas worldwide ranging from strictly protected sites without any human intervention to conservation areas and territories managed for the sustainable use of natural resources; and their number and size are continuously growing (WDPA, 2014). The financial means, though, too often fall short of what is needed for the sustainable management of existing sites, not to mention the conservation of new protected areas (Balmford et al., 2002; Emerton et al., 2006). Developing countries, in particular, lack capital to meet conservation costs (Balmford et al., 2003). To support current state and donor funding and attract new investment sources, it stands to reason to reflect on private sector engagement.

Nowadays, environmental responsibility takes an innovative role in the development of corporate strategies (Esty and Winston, 2009; Laszlo, 2008; Winn and Pogutz, 2013). However, when it comes to the development and management of protected areas, the engagement of private companies is extremely modest (Emerton et al., 2006). That does not mean that companies do not benefit from ecosystems. Pharmaceutical companies, for instance, derive natural medicines and biochemicals from healthy ecosystems. Seed and breeding companies depend on genetic resources, and the business of the tourism industry relies strongly on biodiversity and scenic beauty (Hanson et al., 2012; Lambooy and Levashova, 2011). Following the idea of payments for ecosystem services (PES), these companies should have an incentive

to pay landholders for the benefits they obtain through particular land management practices (Karousakis and Brooke, 2010; Wunder, 2005). So why are private investors proving reluctant to commit significant financial resources for international conservation projects?

In order to answer this question, it needs to be considered that many ecosystem services are public goods characterized by non-rivalry and non-excludability (Pascual and Muradian, 2010). This leads to the problem that companies that invest in protected areas not only have to share the resulting benefits (positive externalities) but also suffer from the exhaustion of ecological resources caused by other market participants (negative externalities) (Tietenberg and Lewis, 2012). These externalities are crucial for the investment behavior of companies as they constitute the basis for the free rider problem (Barrett, 2007). Environmental agreements (EAs) aim to overcome such social dilemmas. Yet, corporate EAs that enable companies to collectively manage ecological challenges on a global scale have gained minor attention in literature.

In general, little is known about the supply side of conservation finance for ecosystems and the opportunities and risks along the conservation investment value chain (Credit Suisse et al., 2014). Current studies, though, emphasize that the monetary and conservation benefits of existing projects are still not enough identified and standardized from an investor‘s perspective, and that there are too few salable projects (Credit Suisse et al., 2014; WEF 2013). Thus, verification and third party certification of projects' real social and environmental impacts might reduce the caution of investors (Bayon, 2004; Karousakis and Brooke, 2010; Kate et al., 2004).

Land-based certification is not a new concept (Dudley, 2003; Sperling and de Kock, 2010). However, international markets for land-based certificates are in the very beginning of conceptualization and need further research as well as empirical evidence obtained from pilot projects (Carius, 2012; Parker et al., 2009; Vorhies, 2013). In order to contribute to the recent discussion on global, land-based certification schemes, the main objective of this dissertation is to explore an international market place for protected area certificates (PACs) and its potential to attract pri-

vate sector investment to improve ecosystem sustainability. For this purpose, the following key questions are addressed: (1) What impacts do corporate EAs have on private sector investment when the certification of protected areas is concerned? (2) What motives do companies have to voluntarily contribute to the protection and conservation of ecosystems? (3) What design principles are crucial for land-based certification schemes in order to attract investment from the private sector? (4) Do land-based certification schemes have the power to create 'win-win' solutions for both private investors in industrialized economies as well as stakeholders in developing countries?

In order to analyze the impacts that corporate EAs have on private sector investment in certified protected areas, chapter 2 starts with the development of a non-cooperative coalition game. In the model, companies not only have the possibility to buy PACs and label their products accordingly but also to join a coalition that obligates its members to provide financial means for certified protected areas. The corporate dependency on ecosystems is modeled through the ecological footprint. Following the subgame perfect Nash equilibria determined via backward induction, the model shows that certification of environmental performance reduces free riding incentives and corporate EAs cut down the individual cost of ecological protection. By implementing instruments such as side payments, membership restriction and non-compliance penalties, sustainable coalitions exist that improve the payoffs of all coalition members as well as the welfare of society. The findings are supported by a sensitivity analysis conducted for the German tourism sector in Zanzibar, Tanzania.

In chapter 3 and 4, semi-structured expert interviews are utilized to further explore the demand side of PACs and create empirical evidence for the willingness to invest of private companies. In total, 39 interviews were conducted with representatives from German companies, who are experts in the area of environmental sustainability. The presented results are based on triangulation of quantitative and qualitative methods. While chapter 3 focuses on the identification of key motives for companies to contribute to the protection and conservation of ecosystems, chapter 4

is mainly concerned with product and market requirements defined by potential investors from the private sector.

In chapter 3, the exploratory factor analysis complemented with the qualitative description of PAC market opportunities and risks identifies three key motives to be of special interest for corporate PAC demand: direct financial benefits; the social legitimacy of entrepreneurial business; and the corporate dependency on ecosystems. The corporate dependency on ecosystems is assumed to have the strongest influence on PAC demand. Based on the identified key motives, chapter 4 uses a two-step clustering procedure to identify strategic investor groups. In combination with the quantitative and qualitative description of product and market requirements, seven PAC design principles are determined that might encourage private sector investment. In fact, almost 40 per cent of the experts stated that their company would buy PACs if certain requirements are met.

Finally, chapter 5 critically evaluates the potential of a market place for PACs to create 'win-win' solutions for private investors in industrialized economies as well as stakeholders in developing countries. The PAC demand side is described on the basis of the expert interviews undertaken with representatives from German companies. The supply side is examined by using 26 interviews conducted with protected area experts and key decision-makers in Tanzania. Combining the results of the studies, two challenges are identified to be of major importance for the sound implementation of a PAC market. First, protected areas should focus on efficiency targets rather than on poverty alleviation to attract investment from the private sector. And second, the political and institutional conditions in potential PAC supply countries are required to improve the investment climate by reducing bureaucracy, mismanagement and corruption.

Keywords: Protected areas, certification, payments for ecosystem services, willingness to invest, ecosystem sustainability, Tanzania

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Abbreviations

BfN	Bundesamt für Naturschutz / Federal Agency for Nature Conservation
BMBF	Bundesministerium für Bildung und Forschung / Federal Ministry for Education and Research
CBD	Convention on Biological Diversity
CBFM	Community-Based Forest Management
CBNRM	Community-Based Natural Resource Management
CCB	Climate Community & Biodiversity
CDM	Clean Development Mechanism
CER	Corporate Environmental Responsibility
CERPA	Certification of Protected Areas
COP	Conference of the Parties
CSA	Climate Smart Agriculture
EA	Environmental Agreement
FAO	Food and Agriculture Organization
FOC	First Order Condition
FONA	Forschung für Nachhaltigkeit / Research for Sustainable Development
FPIC	Free, Prior and Informed Consent
FSC	Forest Stewardship Council
FTSE	Financial Times Stock Exchange
GDI	Green Development Initiative
IEA	Institut für Entwicklungs- und Agrarökonomik / Institute of Development and Agricultural Economics
IUCN	International Union for Conservation of Nature
IUW	Institut für Umweltökonomik und Welthandel / Institute for Environmental Economics and World Trade
JFM	Joint Forest Management
LUH	Leibniz Universität Hannover / Leibniz University of Hannover
MBI	Market-Based Instrument
NGO	Non-Governmental Organization
NNF	Namibia Nature Foundation

PAC	Protected Area Certificate
PES	Payments for Ecosystem Services
PFM	Participatory Forest Management
PoWPA	Programme of Work on Protected Areas
REDD	Reducing Emissions from Deforestation and Forest Degradation
SAFA	Sustainability Assessment of Food and Agriculture systems
SLIMF	Small and Low-Intensity Managed Forests
SME	Small and Medium sized Enterprise
TEEB	The Economics of Ecosystems and Biodiversity
UNDP	United Nations Development Programme
VCA	Verified Conservation Areas
WAWI	Institut für Wasserwirtschaft / Institute of Water Resources Management, Hydrology and Agricultural Hydraulic Engineering

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1 Introduction

The biological capacity of the earth is limited (Rockström et al., 2009). While this is obvious at first glance, it has been ignored for decades and mankind has consumed more natural resources than the earth has been capable to regenerate (Ewing et al., 2010). This leads not only to a continuing conversion of ecosystems characterized by biodiversity loss and degradation of provisioning, regulating, cultural and supporting services but also has severe impacts on human well-being (Duraiappah and Naeem, 2005; Jax, 2010; Mainka et al., 2005). In the face of population growth, increasing industrialization and growing interdependence of economic activities worldwide, the situation threatens to aggravate; and the clamor for sustainable management of ecosystems grows steadily louder (Chapin et al., 2009; UNEP, 2011).

1.1 Background and Problem Statement

One solution to reduce the anthropogenic impacts on ecosystems is the development of protected areas (Bertzky et al., 2012; Duraiappah and Naeem, 2005). According to the International Union for Conservation of Nature (IUCN) a protected area is a "clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values" (Dudley, 2008). The establishment of protected areas is by no means a new idea (Chandran and Hughes, 2000; Eagles et al., 2002). Its importance, though, becomes more evident as global pressure on nature is increasing (Chape et al., 2008). While only 9214 protected areas existed in 1962, four decades later its number had increased to 102,102 (Chape et al., 2003). Currently, there are more than 210,000 protected areas worldwide ranging from strictly protected sites without any human intervention to conservation areas and territories managed for the sustainable use of natural resources; and their number and size are continuously growing (WDPA, 2014). In 2012, protected areas covered 14.6 per cent of the earth's land surface, 9.7 per cent of marine areas in coastal waters and 5.3 per cent of the global marine areas of potential national jurisdiction (Jensen, 2013). According to the Aichi Targets defined by the Conven-

tion on Biological Diversity (CBD) during the 10th meeting of its Conference of the Parties COP-10 held in Nagoya in 2010 "by 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas [...] are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas" (CBD, 2010). Global concerns on climate change underline the need for concerted efforts in this direction (Dudley et al., 2010).

The financial means, though, too often fall short of what is needed for the sustainable management of existing sites, not to mention the conservation of new protected areas (Balmford et al., 2002; Emerton et al., 2006). Developing countries, in particular, lack capital to meet conservation costs (Balmford et al., 2003). Although an impressive number of protected areas have been legally established in Africa, Asia and Latin America, many of them face major structural and prolonged problems in their effective implementation and are not able to conserve the natural and biological resources they contain (Duffy, 2006; Setsaas et al., 2007; Wilkie et al., 2001). The costs for the effective management of all existing protected areas in developing countries are estimated between US$1.1 billion to US$2.5 billion per year with a current funding gap of US$1 billion to US$1.7 billion per year (Bruner et al., 2004; James et al., 1999; James et al., 2001; Vreugdenhil, 2003). At the same time, ecosystems that formally fall under protected area categories often provide the livelihood base for local communities, in particular the rural poor (CBD, 2008). As a consequence, additional funding is required to compensate the opportunity costs of local people (Ferraro, 2001; Karousakis and Brooke, 2010; TEEB, 2010). The financial situation becomes even more problematic as number and size of protected areas are rising, along with costs related to increased governance complexities. State and donor funding opportunities do not keep pace with this trend and the discrepancy between required and available funds is likely to increase in the future (Emerton et al., 2006; Jenkins et al., 2004; Scherr et al., 2010) As a result, it stands to reason to reflect on private sector engagement.

Nowadays, environmental responsibility takes an innovative role in the development of corporate strategies (Esty and Winston, 2009; Laszlo, 2008; Winn and Pogutz, 2013). For instance, the increasing application of environmental manage-

ment systems indicates that more and more companies implement sustainable practices into their core business (ISO, 2010). The way how companies improve their environmental performance varies: increase of resource efficiency, development of clean technologies, or prevention and reduction of waste, just to name a few (Gunningham, 2009). With the aim to support theory development and provide empirical evidence for the corporate willingness to invest in the conservation of nature, many case studies have been conducted (Bansal and Roth, 2000; Dummett, 2006; Hoffman, 2001; Paulraj, 2009; Schwartz, 2009). Studies from Germany (Gamerschlag et al., 2011; Hahn and Scheermesser, 2006; Riess and Peters, 2005; Silberhorn and Warren, 2007) as well as from other countries (Brønn and Vidaver-Cohen, 2009; Dummett, 2006; Koellner et al., 2010) consistently emphasize the improvement of the corporate reputation and brand image as one of the main drivers for a company to address the socio-ecological challenges of our world.

Depending on the sector and location of a company, further drivers are the realization of cost savings and compliance with legislation (Dummett, 2006; Hahn and Scheermesser, 2006; Koellner et al., 2010) as well as the mitigation of ecological risks that stem from natural disasters and the depletion of resources (CDP, 2012a/b; Trucost, 2013). Besides these instrumental motives that are based on the belief to increase the profit of a company or at least protect its existing revenues, scientists also emphasize relational and moral motives for corporate responsibility that focus on creating positive relationships between the company and its stakeholders or acting ethically appropriate (Aguilera et al., 2007; Bansal and Roth, 2000; Brønn and Vidaver-Cohen, 2009; Koellner et al., 2010; Matten, 2006).

However, when it comes to the development and management of protected areas, the engagement of private companies is extremely modest (Emerton et al., 2006). That does not mean that companies do not benefit from ecosystems. Pharmaceutical companies, for instance, derive natural medicines and biochemicals from healthy ecosystems. Seed and breeding companies depend on genetic resources, and the business of the tourism industry relies strongly on biodiversity and scenic beauty (Hanson et al., 2012; Lambooy and Levashova, 2011).

Many economists see market-based instruments (MBIs) as the preferable policy option to generate financial means from the private sector for the conservation of nature (Mandel et al., 2010; Vatn et al., 2011; WWF 2009). MBIs focus on encouraging behavior through market signals rather than through command and control mechanisms based on legal requirements and obligations (Stavins, 2001). They neither define environmental targets nor do they specify any conservation measures. In fact, corporate environmental activities are influenced by an administered price, like product charges, non-compliance fees, tax incentives and subsidies, or an administered market, such as tradable pollution permits and payments for ecosystem services (Karousakis and Brooke, 2010; Pearce and Barbier, 2000).

The idea behind payments for ecosystem services (PES) is that users of ecosystem services pay landholders for the benefits they obtain through particular land management practices (Karousakis and Brooke, 2010; Wunder, 2005). Based on the beneficiary-pays principle, PES transform external values of ecosystem services into payments for the conservation of ecosystems (Engel et al., 2008). In general, PES are defined as "a voluntary, conditional agreement between at least one 'seller' and one 'buyer' over a well-defined environmental service - or a land use presumed to produce that service" (Wunder, 2007). Following the PES concept, companies that benefit from healthy ecosystems should have an incentive to pay for the sustainable management of these ecosystems (Karousakis and Brooke, 2010; Wunder, 2005). Actually, on a local level more and more companies pay for the provision of ecosystem services (IIED, 2007; Mwangi, 2008; Perrot-Maître, 2006; Stanton et al., 2010). On an international level, however, private sector investment in PES schemes is still limited (Karousakis and Brooke, 2010).

In order to understand why private investors are proving reluctant to commit significant financial resources for international conservation projects, it needs to be considered that many ecosystem services are public goods characterized by non-rivalry and non-excludability (Pascual and Muradian, 2010). This leads to the problem that companies that invest in protected areas not only have to share the resulting benefits (positive externalities) but also suffer from the exhaustion of ecological

resources caused by other market participants (negative externalities) (Tietenberg and Lewis, 2012). These externalities are crucial for the investment behavior of companies as they constitute the basis for the free rider problem; a situation in which the individual self-interest of players leads to a social outcome that is not Pareto optimal (Barrett, 2007). Environmental agreements (EAs) aim to overcome such social dilemmas and are typically described by cooperative approaches that are based on the concept of the core (Chander and Tulkens, 1997) or by non-cooperative approaches that follow internal and external stability conditions (Barrett, 1994; Carraro and Siniscalco, 1993). Yet, scientific EA studies that applied coalition game approaches either focused on the design of international EAs between countries that face global public good allocation problems (Barrett and Stavins, 2003; Finus et al., 2009) or on the cooperation between locally affected agents (e.g. companies, residents, neighboring countries) that sustainably manage common-pool resources (Abbink et al., 2005; Ambec and Ehlers, 2008). Corporate EAs that enable companies to collectively manage ecological challenges on a global scale have gained minor attention.

In general, little is known about the supply side of conservation finance for ecosystems and the opportunities and risks along the conservation investment value chain (Credit Suisse et al., 2014). Current studies, though, emphasize that the monetary and conservation benefits of existing projects are still not enough identified and standardized from an investor‘s perspective, and that there are too few salable projects (Credit Suisse et al., 2014; WEF 2013). Thus, verification and third party certification of projects' real social and environmental impacts might reduce the caution of investors (Bayon, 2004; Karousakis and Brooke, 2010; Kate et al., 2004). Typically, certification schemes aim to demonstrate that products, services or processes conform to specific performance metrics (Corsin et al., 2007). Regarding the establishment and management of protected areas, certification can be used to verify if social and ecological best practices are applied and what conservation outcomes are realized (Meijaard et al., 2011).

Land-based certification is not a new concept and is particularly relevant for indigenous-run protected areas under community-based natural resource management (CBNRM) programs, and protected areas managed according to IUCN categories V (protected landscape / seascape) and VI (protected area with sustainable use of natural resources) (Dudley, 2003; Sperling and de Kock, 2010). Yet, international markets for land-based certificates, which aim to develop resilient conservation finance, are in the very beginning of conceptualization and need further research as well as empirical evidence obtained from pilot projects (Carius, 2012; Parker et al., 2009; Vorhies, 2013).

1.2 Research Objectives

In order to contribute to the recent discussion on global, land-based certification schemes, the main objective of this dissertation is to explore an international market place for protected area certificates (PACs) and its potential to attract private sector investment to improve ecosystem sustainability. The PAC market is assumed to be an international institution that regulates the conservation of ecosystems and coordinates the exchange of financial means between investors and project developers. Conceptually, PACs are issued for geographical areas that are certified as protected pursuant to specific standards for both social and ecological best practices.

In contrast to carbon markets that solely supply offsets for greenhouse gas emissions, land-based certificates offer an integrated approach for ecosystems and their variety of benefits. Investors can choose which protected area they want to support. Companies, for example, get the possibility to pay for projects focusing on ecosystem benefits that are important for the success of their business. However, it needs to be considered that no property rights are granted through PAC investment; hence that PACs cannot be used as a means to get access to land and other resources. The purchase of certificates shall be rather interpreted as a safeguard for best practices on particular areas. Given this scenario, the dissertation addresses the following key questions:

1. What impacts do corporate EAs such as public or company driven environmental initiatives have on private sector investment when the certification of protected areas is concerned? (Chapter 2)

2. What motives do companies have to voluntarily contribute to the protection and conservation of ecosystems? (Chapter 3)

3. What design principles are crucial for land-based certification schemes in order to attract investment from the private sector? (Chapter 4)

4. Do land-based certification schemes have the power to create 'win-win' solutions for both private investors in industrialized economies as well as stakeholders in developing countries? (Chapter 5)

1.3 Structure of the Dissertation

The dissertation is divided into five chapters. Chapter 1 covers the introductory part of the dissertation. The remaining chapters present one article each. An overview of the articles is given in Table 1.1. Chapter 2 deals with the development of a non-cooperative coalition game in order to analyze the impacts that corporate EAs have on private sector investment in certified protected areas. In the model, companies not only have the possibility to buy PACs and label their products accordingly but also to join a coalition that obligates its members to provide financial means for certified protected areas. The coalition is based on a corporate EA that determines the number and type (e.g. origin, provided ecosystem benefits) of PACs that signatories of the public or company driven environmental initiative are required to buy in a certain period. The corporate dependency on ecosystems is modeled through the ecological footprint. Following the subgame perfect Nash equilibria determined via backward induction, the model shows that certification of environmental performance reduces free riding incentives and corporate EAs cut down the individual cost of ecological protection.

When companies individually decide on their environmental strategy, they only value the benefits for their own business and the investment in PACs falls below the

socially optimal amount. This constitutes a typical problem in the allocation of public goods, in which incentives to free ride increase with the environmental activities of strategic opponents. But when certificates can be used to label the products of a company as eco-friendly, free riding incentives are partly countered by the attempt to gain a price premium. The demand for PACs can further be increased through corporate EAs. By implementing instruments such as side payments, membership restriction and non-compliance penalties, sustainable coalitions exist that improve the payoffs of all coalition members as well as the welfare of society. The findings are supported by a sensitivity analysis conducted for the German tourism sector in Zanzibar, Tanzania.

In chapter 3 and 4, semi-structured expert interviews are utilized to further explore the demand side of PACs and create empirical evidence for the willingness to invest of private companies. In total, 39 interviews were conducted with representatives from German companies, who are experts in the area of environmental sustainability. The presented results are based on triangulation of quantitative and qualitative methods. While chapter 3 focuses on the identification of key motives for companies to contribute to the protection and conservation of ecosystems, chapter 4 is mainly concerned with product and market requirements defined by potential investors from the private sector.

In chapter 3, the exploratory factor analysis complemented with the qualitative description of PAC market opportunities and risks identifies three key motives to be of special interest for corporate PAC demand. First of all, buying land-based certificates would enable companies to establish a unique selling point, and thus gain direct financial benefits. Second, the investment in PACs is expected to create a positive public perception and lead to social legitimacy of business activities. Third, protected areas support the conservation of ecosystems, avoid resource depletion and reduce ecological risks; all aspects that relate to the corporate dependency on ecosystems. Of the three key motives, the corporate dependency on ecosystems is assumed to have the strongest influence on PAC demand. While a lot of different environmental protection measures exist that provide direct financial benefits and

support legitimation issues, there is yet no mature certification scheme for the holistic conservation of geographical areas. This is why PACs provide those companies that have a high dependency on ecosystems with an attractive investment opportunity to secure their long-term business success.

Based on the identified key motives, chapter 4 uses a two-step clustering procedure to identify strategic investor groups. In combination with the quantitative and qualitative description of product and market requirements, seven PAC design principles are determined that might encourage private sector investment. In fact, almost 40 per cent of the experts stated that their company would buy PACs if certain requirements are met; providing strong support for the development of a global, land-based certification scheme. Four of the design principles describe general requirements for corporate PAC demand: a credible standard as well as a transparent certification scheme exist; only those protected areas are certified that are efficient in terms of ecosystem sustainability; and flexible investment opportunities are available that allow companies to not only chose the origin and type of protected areas but also the overall investment amount. The remaining three design principles are based on investor type specific requirements: companies identified as leaders call for easy and quick market access; (economic) risk mitigators would appreciate a classification of PACs into different ecosystem benefit categories; and environmentalists are mainly interested in the depiction of the global importance of protected areas.

Having a look at existing markets for protected areas, one scheme stands out to come close to the defined design principles: the LifeWeb initiative hosted by CBD. However, the current LifeWeb does not provide any certification system for supplied projects. Once projects have been matched, they are not further monitored and neither management practices nor project outcomes are verified. This is in contrast to the credibility and efficiency criteria requested by all investor types. Regarding the development of a PAC market, it is thus recommended to build upon the LifeWeb initiative and establish an additional category of certified conservation projects that issue land-based certificates.

Finally, chapter 5 critically evaluates the potential of a market place for PACs to create 'win-win' solutions for private investors in industrialized economies as well as protected area developers, landholders and local communities in developing countries. The PAC demand side is described on the basis of the expert interviews undertaken with representatives from German companies. The supply side is examined by using 26 interviews conducted with protected area experts and key decision-makers in Tanzania. The combined results of the two studies are evaluated from three different perspectives: the required PAC market framework; the existing political and institutional situation in Tanzania; and the ecosystem benefits that are most suitable for PACs. Following the analysis, two challenges are identified to be of major importance for the sound implementation of a PAC market. First, protected areas should focus on efficiency targets rather than on poverty alleviation to attract investment from the private sector. This must, however, not come at the cost of socio-economic best practices for protected area management. Whenever possible, environmental targets need to be complemented with poverty reduction goals. Second, the political and institutional conditions in potential PAC supply countries are required to improve the investment climate by reducing bureaucracy, mismanagement and corruption. Generally, re- or afforestation projects in Tanzania's tourist areas are revealed to be most suitable to generate PACs; attracting investment from the international tourism or paper and pulp industry as well as other industries that are interested in ecosystem benefits provided by protected forest areas.

Overall, this dissertation discusses the potential of an international PAC market to attract private sector investment for the protection and conservation of ecosystems. Not only does the dissertation help policy makers to get a first impression about companies' willingness to invest in ecosystem sustainability but also to identify major product and market requirements for the sound implementation of global, land-based certification schemes. Addressing the presented opportunities and risks will be a future task for PES schemes such as REDD+ (Reducing Emissions from Deforestation and Forest Degradation), VCA (Verified Conservation Areas) and the LifeWeb initiative.

Chapter	Authors	Title
2	Nathalie Meißner, 2013	The incentives of private companies to invest in protected area certificates: How coalitions can improve ecosystem sustainability. Published in Ecological Economics 95, 148–158.
	Nathalie Meißner, 2012	Setting the right incentives for private companies to invest into the sustainable use of ecosystem services. Presented at the 2012 Berlin Conference on Evidence for Sustainable Development, 5–6th October 2012, Berlin, Germany.
3	Nathalie Meißner, Ulrike Grote, 2014	Motives for private sector investment in protected areas with international importance: Evidence from German companies.
	Nathalie Meißner, Markus Weber, 2013	Nachhaltigkeit in der Unternehmenswelt - ein Überblick. Published in Andreas Model (Ed.), 2013. Nachhaltigkeitsmanagement in deutschen Unternehmen - Beispiele aus der Praxis, epubli GmbH, Berlin, Germany, pp. 15–29.
4	Nathalie Meißner, Etti Winter, 2014	Design principles for protected area certificates: A case study on strategic investor groups.
5	Nathalie Meißner, Till Stellmacher, 2014	Protected area certificates: A critical evaluation of their potential to create 'win-win' solutions in Tanzania.

Table 1.1: List of articles included in the dissertation

Note: The contribution of the authors to the articles is as follows. Literature review, model development, data collection, all calculations, writing and text editing have been done by Nathalie Meißner unless noted otherwise. The contribution of Ulrike Grote in chapter 3 can be defined as overall supervision and guidance on general contents. Markus Weber from Germanischer Lloyd Certification GmbH gave insights into the processes of an independent third party certifier. In chapter 4, Etti Winter provided suggestions for the discussion of results. Furthermore, writing subchapter 4.2 was equally divided between Nathalie Meißner and Etti Winter. In chapter 5, Till Stellmacher was in charge of data collection in Tanzania as well as writing subchapter 5.5.

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2 The incentives of private companies to invest in protected area certificates: How coalitions can improve ecosystem sustainability

This chapter is a version of:

Meißner, N., Grote, U., 2014. Motives for private sector investment in protected areas with international importance: Evidence from German companies.

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3 Motives for private sector investment in protected areas with international importance: Evidence from German companies

Abstract

What incentives do companies have to make a voluntary contribution to the protection and conservation of ecosystems? Could an international market for protected area certificates boost private investment? These questions are evaluated based on semi-structured expert interviews conducted in 39 German companies. Triangulation is used for data analysis to combine the advantages of quantitative and qualitative methods. The exploratory factor analysis complemented with qualitative interview results identifies three key motives to be of special interest for private sector investment: direct financial benefits; the social legitimacy of entrepreneurial business; and the corporate dependency on ecosystems. The corporate dependency on ecosystems is assumed to have the strongest influence. In total, almost 40 per cent of the experts stated that their company would invest in protected area certificates if a credible and transparent certification scheme exists. This provides strong support for the development of a certification scheme for protected areas.

Keywords: Protected areas, certification, corporate environmental responsibility, willingness to invest, factor analysis

3.1 Introduction

Nowadays, environmental responsibility takes an innovative role in the development of corporate strategies (Esty and Winston, 2009; Laszlo, 2008; Winn and Pogutz, 2013). For instance, the increasing application of environmental management systems indicates that more and more companies implement sustainable practices into their core business (ISO, 2010). The way how companies improve their environmental performance varies: increase of resource efficiency, development of clean technologies, or prevention and reduction of waste, just to name a few (Gunningham, 2009). However, when it comes to the development and management of protected areas, the engagement of private companies is limited (Emerton et al., 2006).

The protection of geographical areas is an important measure to preserve ecosystems and their multitude of provisioning, regulating, cultural and supporting services (Duraiappah and Naeem, 2005). Functioning ecosystems in turn are the basis for biodiversity conservation, and often provide companies with numerous benefits. Pharmaceutical companies, for instance, derive natural medicines and biochemicals from healthy ecosystems. Seed and breeding companies depend on genetic resources, and the business of the tourism industry relies strongly on biodiversity and scenic beauty (Hanson et al., 2012; Lambooy and Levashova, 2011). In 2012, 14.6 per cent of the world's terrestrial area and 9.7 per cent of marine areas in coastal waters were protected (Jensen, 2013). The main donors are national states, NGOs and charities. Overall spending on protected areas, though, falls short of what is needed. In fact, financial means are neither enough to establish a representative network of protected areas on a global scale nor to sustainably finance existing sites (Emerton et al., 2006). International markets for land-based certificates are considered one solution to increase private sector investment and remedy funding shortfalls. Yet, leading initiatives such as REDD+ (Reducing Emissions from Deforestation and Forest Degradation) and VCA (Verified Conservation Areas) are still in their infancy (Carius, 2012; Parker et al., 2009; Vorhies, 2013).

In order to learn about the corporate willingness to invest in protected areas, expert interviews with representatives from German companies were conducted. With

respect to the results of the survey, the article addresses two key questions. First, what incentives do companies have to voluntarily contribute to the protection and conservation of ecosystems? And second, what are the opportunities and risks of an international market for protected area certificates regarding the promotion of private sector investment? Answering these questions, the article not only contributes to the understanding of corporate motives to engage in environmental protection but also to the development of an international certification scheme for the conservation of ecosystems. Most importantly, the results help policy makers to quantify potential investment from private companies in protected areas that are certified under a credible and transparent standard.

The outline of the article is as follows. Section 3.2 starts giving an overview of general drivers for corporate environmental responsibility. Afterwards, section 3.3 presents the questionnaire and describes the process of data collection and data analysis. The results derived from the expert interviews are displayed in section 3.4. First, corporate drivers to invest in the protection and conservation of ecosystems are identified. Applying the approach of exploratory factor analysis, the drivers are then grouped into key motives. The section closes with a review of the potential market for protected area certificates. Stated investment decisions are summarized and the most reported opportunities and risks are highlighted. In section 3.5, the results are discussed in detail and methodological limitations are described. The article concludes with section 3.6 by reflecting the original targets and giving an outlook to future work.

3.2 Drivers for Corporate Environmental Responsibility (CER)

During the United Nations Conference on Environment and Development held in Rio de Janeiro in 1992, the international community emphasized the responsibility of companies to integrate environmental concerns into strategic decision making (UNCED, 1992). Since then, many case studies have been conducted to support theory development and provide empirical evidence for the corporate willingness to

invest in the conservation of nature (Bansal and Roth, 2000; Dummett, 2006; Hoffman, 2001; Paulraj, 2009; Schwartz, 2009). Studies from Germany (Gamerschlag et al., 2011; Hahn and Scheermesser, 2006; Riess and Peters, 2005; Silberhorn and Warren, 2007) as well as from other countries (Brønn and Vidaver-Cohen, 2009; Dummett, 2006; Koellner et al., 2010) consistently emphasize the improvement of the corporate reputation and brand image as one of the main drivers for a company to address the socio-ecological challenges of our world. The communication of corporate engagement might not only increase the shareholder value (Figge, 2005; Guenster et al., 2011; Hart and Milstein, 2003) and encourage competitive advantages (McWilliams and Siegel, 2011; Nidumolu et al., 2009; Porter and Kramer, 2006; Tetrault Sirsly and Lamertz, 2008) but also allows companies to gain a price premium through an increased willingness to pay for eco-friendly products (Dörr, 2009; Juutinen et al., 2011). Corporate responsibility can have severe influence on the purchasing behavior of customers (Meijer and Schuyt, 2005; Sen and Bhattacharya, 2001), and thus be as important as the advertisement and the research and development activities of a company (Gardberg and Fombrun, 2006).

Depending on the sector and location of a company, further drivers such as the realization of cost savings and compliance with legislation do also play an important role for investment in environmental protection (Dummett, 2006; Hahn and Scheermesser, 2006; Koellner et al., 2010). Cost savings are especially important for the manufacturing industry in which energy and waste reduction are crucial in cutting overall production costs (Epstein and Roy, 2001; Hahn and Scheermesser, 2006). Regarding legislative drivers, the environmental performance of a company is influenced by government control and by the pressure from norms and regulations (Delmas and Toffel, 2004; DiMaggio and Powell, 1983; Schwartz, 2009) such as codes of conduct in buyer-supplier relationships (Pedersen and Andersen, 2006). Furthermore, not only existing regulation encourages corporate responsibility. In fact, companies might protect the environment if future legislation is expected. On the one hand, this is due to the assumption of being able to adapt more quickly to mandatory requirements and to gain pioneering advantages when it comes to the development of new markets (Porter and van der Linde, 1995). On the other

hand, companies try to avoid legislative control by voluntary commitment (Brønn and Vidaver-Cohen, 2009; Dummett, 2006). However, policy uncertainty can also hinder investment in environmental protection measures. This is particularly the case if financial efforts are at stake. For instance, if companies lose their investment due to regulations that develop in another than the expected direction (CDP, 2012a; Dummett, 2006).

In order to sustain their business in the long run, companies also strive for the mitigation of ecological risks that stem from natural disasters and the depletion of resources (Trucost, 2013). Especially, companies with global value chains feel increasingly exposed to the physical boundaries of the planet (Lambooy and Levashova, 2011). According to surveys of the Carbon Disclosure Project (CDP, 2012a/b), 81 per cent of the 500 largest companies, which are included in the FTSE Global Equity Index Series, reported to be exposed to physical risks resulting from climate change. Additionally, 43 per cent of the companies stated to be affected by water-related business risks. In terms of resource availability, experts of the Global Footprint Network estimate that humankind already needs an equivalent of 1.5 earths to cover its demand on nature. In a resource-constrained world companies have no other choice than to adapt their strategies. In particular, as the Global Footprint Network expects global demand to increase to 2.0 earths by 2030 if current trends in population growth and consumption continue (Ewing et al., 2010).

Besides instrumental motives that are based on the belief to increase the profit of a company or at least protect its existing revenues, scientists also emphasize relational and moral motives for corporate responsibility (Aguilera et al., 2007; Bansal and Roth, 2000; Brønn and Vidaver-Cohen, 2009; Koellner et al., 2010; Matten, 2006). Relational motives aim to legitimize the business by creating positive social relationships between the company and its stakeholders (e.g. employees, management, customers) (Backhaus et al., 2002; Bansal and Clelland, 2004; Harrison and Freeman, 1999). Environmental protection measures driven by moral concerns focus on acting ethically appropriate even if there is no economic benefit (Takala and Pallab, 2000; Wulfson, 2001).

3.3 Methods and Data

Interviews were conducted with representatives from German companies, who are experts in the area of environmental sustainability. Both standardized questions with predefined answers as well as non-standardized questions were raised. The semi-structured format was chosen for two reasons. First, to get to know more about individual corporate attitudes toward CER. And second, to tailor the questions to the experiences of the interview partners. The participants of the survey could choose between an interview conducted face-to-face or via telephone.

3.3.1 Framework of Expert Interviews

The questionnaire consists of three parts. First, experts were asked about general enterprise data and their company's engagement in environmental protection. In the second part of the interview, 13 different CER drivers were discussed and experts were invited to quantify their views at a given Likert scale from '1: not important' to '7: extremely important'. In the selection of drivers, it was ensured that all measures are applicable to the protection and conservation of ecosystems. In the last part of the interview, the idea of an international market for protected area certificates (PACs) was introduced. Experts were told that PACs are based on the certification of geographical areas in which ecosystems are conserved pursuant to an internationally accepted standard. Companies that buy PACs do not only offer financial support for the development and management of protected areas but also offset their impact on ecosystems. Furthermore, companies can decide in which protected area they want to invest (e.g. country of origin, provided ecosystem benefits). However, no property rights are granted; the protected areas are either managed by government agencies, environmental charities or the local community (Dudley, 2008). This means that the company's access to natural resources is not improved. The discussion of the market framework was followed by the question if companies would be willing to invest in PACs. In addition, they were asked to name opportunities and risks, they see in the development of an international PAC market.

3.3.2 Data Collection

At the beginning of the data collection process, five different databases of potential interview partners were identified from which 253 companies were invited via email to participate in the survey. The data sets and their corresponding shares in the initial sample of invited companies are listed in Table 3.1.

Database	General description	Share
Top 100	100 largest German companies in 2011 in terms of annual turnover (SZ, 2011)	20%
Environmental networks	Members of the German Association of Environmental Management (B.A.U.M., 2012) and the Environmental Partnership in Hamburg (Umwelt Partnerschaft, 2012)	60%
Top 100 Food	100 largest German suppliers in the food retail sector in 2011 in terms of annual turnover (LZ, 2012)	10%
Tourism industry	Companies that are awarded the TourCert CSR tourism label (TourCert, 2012) or companies offering offsets for air travel emissions that meet the requirements of the Gold Standard (Atmosfair, 2012)	10%

Table 3.1: Databases for the identification of survey participants

First, the 100 largest German companies in terms of annual turnover were considered (SZ, 2011). Second, two environmental networks were included into the database to account for experts within small and medium sized enterprises. While partners of the German Association of Environmental Management are headquartered around the whole country (B.A.U.M., 2012), the regional Environmental Partnership of the city of Hamburg (Umwelt Partnerschaft, 2012) was chosen to minimize the effort of face-to-face conducted interviews. The inclusion of the last two elements of the initial sample is based on the assumption that companies, whose core business depends on the existence of functioning ecosystems (e.g. tourism, pharmaceutical, cosmetic and food industry), have a special interest in buying PACs. Especially, the tourism sector and companies from the food industry are underrepresented in both the top 100 as well as in the environmental networks. Thus, it was decided to complement the sample with the 100 largest suppliers in the food retail sector (LZ, 2012) and with tourism operators that are either awarded the TourCert CSR

tourism label (TourCert, 2012) or offering offsets for air travel emissions that meet the requirements of the Gold Standard (Atmosfair, 2012).

The industry sectors of the invited companies and survey participants are displayed in Table 3.2. The total response rate amounts to 15 per cent with a final sample consisting of 39 companies. The expert interviews were carried out in the period from August 2012 to January 2013 with 62 per cent of the interviews conducted face-to-face and 38 per cent via telephone. On average, the interviews lasted 2 hours each. Mainly, the experts are managing directors (31%) or environmental or sustainability representatives (49%) of their company with the power to decide on environmental investment (63%). With regard to the company size, the survey participants can be almost equally divided between small, medium sized and large enterprises as shown in Table 3.3.

Industry sector	Initial sample		Final sample	
	Percentage	No. of companies	Percentage	No. of companies
C: Manufacturing (except C10/C11/C20)	19.8 %	50	17.9 %	7
C10/11: Food products and beverages	19.0 %	48	10.3 %	4
C20: Chemicals and chemical products	9.9 %	25	5.1 %	2
D: Electricity, gas, steam and air conditioning supply	7.1 %	18	7.7 %	3
G: Wholesale and retail trade	6.7 %	17	5.1 %	2
H: Transportation and storage	6.3 %	16	5.1 %	2
M-N/Q/S: Service activities (except N79)	11.9 %	30	15.4 %	6
N79: Travel agency, tour operator and other reservation service and related activities	5.9 %	15	25.6 %	10
Others	13.4 %	34	7.7 %	3
Total	100.0 %	253	15.4 %	39

Note: Sector classification follows the Statistical Classification of Economic Activities in the European Community (NACE Rev. 2), 2008

Table 3.2: Sector classification of companies in the initial and final sample

Company size	No. of companies	Type
1-9 employees	7	Small enterprises
10-49 employees	7	35.9%
50-249 employees	3	Medium sized enterprises
250-2499 employees	9	30.8%
2500-14,999 employees	7	Large enterprises
15,000-100,000 employees	3	33.3%
> 100,000 employees	3	

Table 3.3: Characterization of survey participants according to company size

3.3.3 Data Analysis

Descriptive statistics are used to examine drivers that are crucial for a company to invest in the development and management of protected areas. Afterwards, an exploratory factor analysis is applied. Aiming to uncover the latent structures that underlie environmental investment drivers and understand key motives for ecosystem protection and conservation, principle axis factoring is used as factor extraction method. The suitability of the data set is evaluated on the basis of the anti-image correlation matrix and the Kaiser-Meyer-Olkin criterion. The number of extracted factors is determined by a combination of Kaiser's eigenvalue greater one criterion, scree test and the interpretation of results. Rotation of factors is conducted via oblique promax (Backhaus et al., 2011; Conway and Huffcutt, 2003; Garson, 2013; Kaiser, 1956). In order to simplify the interpretation of investment drivers and label key motives, both the results from descriptive statistics and exploratory factor analysis are complemented with qualitative statements of the expert interviews. A qualitative content analysis approach is also used to learn from the companies' experiences with existing environmental certification schemes and to identify opportunities and risks of an international PAC market.

3.4 Results

It is assumed that a combination of 13 different CER drivers influences a company's willingness to invest in the protection and conservation of ecosystems. The mean values and standard deviations as well as the percentage of respondents that evaluate a certain investment driver as important are presented in Table 3.4. While the evaluation of twelve CER drivers was directly requested, values for the variable *ecosystem* were determined by the average importance that experts assigned to the following ecosystem benefits: food security, scenic beauty, preservation of cultural services and biodiversity conservation. The experts were also asked about the importance of carbon sequestration and water-related services for the business of their company. However, the additional value of conserving ecosystems goes beyond climate change and water safety. Thus, the importance of functioning ecosystems is expressed by the corporate ranking of benefits that clearly distinguish ecosystem conservation from other environmental protection measures.

Variable	Explanation	Mean	S.D.	Top-box % (Score 5-7)
Image	Creation of a positive image by communicating environmental commitment to stakeholders	5.61	1.55	86.8
Shareholder	Requests from shareholders	5.75	1.32	84.4
Management	Requests from management	5.55	1.48	81.6
Customers	Demand from customers for eco-friendly products	5.55	1.62	78.9
Leadership	Competitive advantage by differentiating the product portfolio toward environmental friendliness	5.05	1.69	73.7
Employees	Environmental needs and wishes of employees	4.62	1.53	59.5
Compliance	Anticipation of mandatory requirements in the future	4.33	1.79	55.6
Resources	Conservation of ecological resources that are used as factor input for the production process of a company	4.39	2.42	52.6
Offset	Moral incentive to offset the corporate impact on nature	4.00	2.05	48.6
Ecosystem	Importance of functioning ecosystems for the business of a company	1.73	2.10	48.6
Business risks	Exposure to risks that stem from the depletion of ecosystems	3.13	2.30	31.6
Price premium	Obtaining a price premium due to an increased willingness to pay of customers for eco-friendly products	3.03	1.91	27.0
NGOs	Collaboration with NGOs owing to external pressure or labeling incentives	3.03	2.05	27.0

Table 3.4: Corporate drivers for ecosystem protection and conservation

In the following, we differentiate between investment drivers with high, medium and low importance. As classification criteria, the top-box results are used. Investment drivers that are evaluated to be important (Score 5-7) for more than two third of the interview partners are classified as drivers with high importance. If at least one third of the respondents stated that a particular measure impacts their environmental policy, the driver is categorized as medium important. The remaining incentives can be summarized as drivers with low importance. Most experts see the improvement of the company's image as a crucial incentive to invest in environmental protection. In addition, taking into account the requests from shareholders, management and customers as well as gaining competitive advantages through a differentiated product portfolio are incentives with high importance. The consideration of employees' needs, the preparation for future legislation, the conservation of resources for the production process and moral motives to offset the company's demand on nature are drivers that play a medium important role for the corporate willingness to invest. Furthermore, the value companies add to functioning ecosystems is classified as investment driver with medium importance as well. Drivers with rather low importance for private sector investment are identified to be the exposure to business risks, obtaining a price premium for eco-friendly products and collaborations with NGOs.

3.4.1 Key Motives for Private Sector Investment in Protected Areas

The authors conduct an exploratory factor analysis in order to consolidate the incentive variables described in Table 3.4 to a reduced number of key motives for private sector investment in protected areas. After the examination of the measure of sampling adequacy, the variable *compliance* is excluded from the data set. With a Kaiser-Meyer-Olkin value of .643, the reduced data set is suitable for factor analysis. Table 3.5 summarizes the factor loads of the four resulting factors and the communalities for each variable. The bivariate correlations between the factors are displayed in Table 3.6. The figures show that moderate correlations between the factors exist. This supports the application of oblique rotation.

Variables	Factors					Communalities
	1: Direct financial benefits	2: Social legitimacy	3: Eco-dependency	4: Internal pressure	5: Regulatory risks	
Leadership	.745	.314	-.082	-.305	-	.781
Price premium	.736	-.128	-.147	-.043	-	.446
NGOs	.519	-.145	.242	.327	-	.535
Customers	.460	.034	.151	.089	-	.317
Image	.068	.892	.106	-.243	-	.782
Employees	-.229	.602	-.206	.520	-	.707
Offset	-.029	.532	.176	.019	-	.319
Business risks	-.290	.148	.971	-.028	-	.874
Resources	.195	.038	.546	-.017	-	.394
Ecosystem	.275	-.014	.302	.260	-	.342
Shareholder	-.088	-.122	.037	.603	-	.341
Management	.219	.354	-.023	.490	-	.616
Compliance	.000	.000	.000	.000	1.000	-
Eigenvalue	3.103	1.423	1.190	0.739	-	-
Variance explained	26%	12%	10%	6%	-	-

Extraction method: principal axis factoring.

Rotation method: promax with Kaiser normalization. Rotation emerged in 6 iterations.

Table 3.5: Factor loadings, eigenvalues and variance explained for key motives

	1: Direct financial benefits	2: Social legitimacy	3: Eco-dependency	4: Internal pressure
1: Direct financial benefits	1.000			
2: Social legitimacy	.336*	1.000		
3: Eco-dependency	.296	-.010	1.000	
4: Internal pressure	.171	.366*	.335*	1.000

Note: Bivariate correlations are displayed (Spearman's Rho)

*Correlation is significant at the 0.05 level (two-tailed)

Table 3.6: Correlation matrix of factors

The first factor has the highest factor loadings for the variables *leadership*, *price premium*, *NGOs* and *customers*. These investment drivers all focus on *direct financial benefits* that are derived from an increase in sales and prices, or at least from a long-term preservation of revenues. The differentiation of the product portfolio through eco-friendly alternatives defines the basis to establish a unique selling point, and thus competitive advantages. If customers prefer eco-friendly products this might not only have a positive impact on sales figures but also on the customers' willingness to pay. Collaborating with NGOs can enhance the credibility of these products and further improve the companies' turnover.

The second factor consolidates the variables *image*, *employees* and *offset*. The correlation between the variables indicates that both considering the employees' needs and offsetting the corporate demand on nature are closely related to image motives. Employees are part of the society. If their environmental concerns are

taken seriously, they are unlikely to make negative headlines. On the contrary, they might even advertise their satisfaction. Furthermore, the linkage between the image and offset driver shows that companies want to be recognized for their moral leadership if they act ethically appropriate and offset their demand on nature. As all three variables aim to legitimize the business of a company by creating a positive public perception of entrepreneurial activities, the second factor is labeled *social legitimacy*.

The variables *business risks*, *resources* and *ecosystem* have the highest factor loadings for the third factor. Companies that state to face high ecological risks as well as companies that are active in the field of resource conservation are typically characterized by a high dependency on ecosystems. Those companies are also more likely to evaluate functioning ecosystems as important for their business. Hence, the third factor is labeled by the term *eco-dependency* and describes a company's motivation to protect the environment due to its dependency on functioning ecosystems. Analyzing the factor loadings, it has to be mentioned that the variable *ecosystem* features a rather low value ($< .45$). However, in comparison to the other factors, the corporate dependency on ecosystems explains the biggest part of the variable's variance.

The fourth factor describes the *internal pressure* of *shareholders*, *employees* and *management* on the corporate culture as one of the key motives for environmental protection measures. As stated above, the variable employees has also a high factor loading for social legitimacy motives. The reason for this is that employees are an essential part of both the society and the company. Thus, it is not possible to clearly allocate requests from employees to internal or external stakeholder motives. Last but not least, the variable *compliance* cannot be described properly as linear combination of the extracted factors. Hence, an additional fifth dummy category named *regulatory risks* is introduced.

3.4.2 Opportunities and Risks of an International PAC Market

In total, 54 per cent of the experts said that their company would not support protected areas, 38 per cent would buy PACs, and 8 per cent were undecided about PAC investment. The four main opportunities of an international PAC market are displayed in Figure 3.1. First of all, companies appreciate the marketing opportunities of land-based certificates (43%). They perceive the conservation of livelihoods for both humans and animals being much easier to promote than, for example, sole emission reduction projects. The second most identified opportunity of an international PAC market is the development of a uniform certification scheme (34%). A common framework for the management of protected areas would allow companies to gain credibility when it comes to the conservation of ecosystems and to compare their activities to the ones of their competitors. Furthermore, experts take a positive view of the international orientation of PACs (26%). In the end, only a global market could solve global environmental problems. Companies also mentioned the bundling of different ecosystem benefits into one product as a big opportunity for PACs to prevail against certificates that are limited to a few environmental issues (20%); especially, since companies can choose which protected area they want to support, and thus which ecosystem benefits are generated.

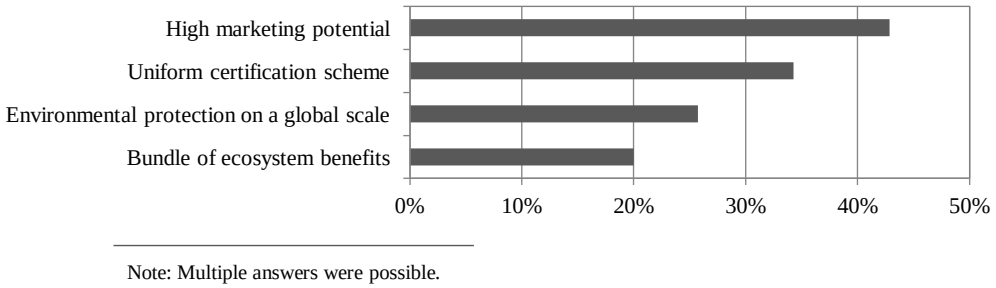

Figure 3.1: Opportunities of an international PAC market (N=35)

In view of the current difficulties in negotiating a successor agreement to the Kyoto Protocol on mandatory greenhouse gas emission reductions, experts agree that voluntary certification schemes are becoming more important to address global environmental challenges. Nonetheless, there are some obstacles that might hinder companies from investing in PACs. Figure 3.2 summarizes the four main risks that

experts see in establishing an international certification market. The most frequently mentioned challenge is the differentiation from other certification schemes as well as from simple charity initiatives (47%). It is important that companies and customers understand the added value of PACs compared to existing investment possibilities. Another obstacle for PAC investment are the additional costs a company has to cover (45%). Especially, because most customers are not willing to pay more for eco-friendly products. Experts stress the need of keeping transactions costs for the management and certification of protected areas at a minimum level. Furthermore, credibility problems can hinder PAC investment (39%). Even if environmental protection measures typically aim to increase a company's image, experts are aware that wrong investment decisions can also damage corporate reputation. A transparent certification scheme is required to avoid credibility problems and successfully introduce an international PAC market. Another risk identified by the experts is that companies might buy PACs to greenwash themselves (39%). Those companies would invest in PACs to present their business as eco-friendly even though no efforts are made to avoid or mitigate environmental pollution.

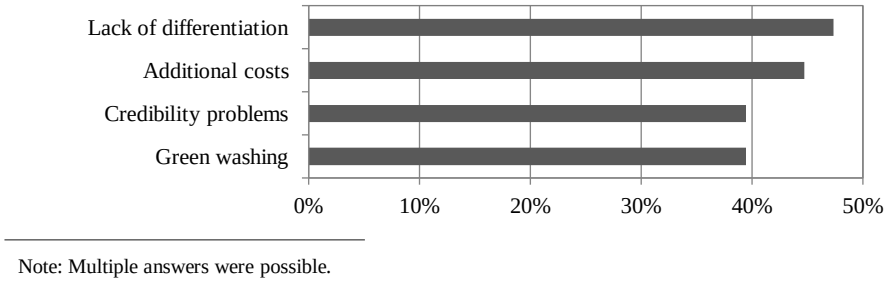

Figure 3.2: Risks of an international PAC market (N=38)

3.5 Discussion

The results of the expert interviews are used to examine to which extent land-based certificates are able to increase private sector investment for protected areas with international importance. Key motives and their potential influence on PAC demand are discussed and the findings are compared with the results from recent CER studies. Furthermore, methodological limitations are reflected.

3.5.1 Key Motives and their Influence on PAC Demand

Direct financial benefits. Financial benefits are the basis for the economic legitimacy of environmental investment. Only when a business case is developed and the economic success is guaranteed, most companies of the study are willing to integrate ecosystem conservation projects into their core business. The identification of direct financial benefits as one of the key motives for ecosystem protection and conservation is consistent with the results from previous studies. For instance, Koellner et al. (2010) classify drivers to invest in ecosystem services into two categories: first, direct financial benefits; and second, indirect or non-financial benefits. Analyzing drivers for ecological responsiveness, Bansal and Roth (2000) also discover profitability motives as one out of three key motives to mitigate a company's impact on nature. Brønn and Vidaver-Cohen (2009) further support the results for corporate sustainability measures in general.

In our study, there are four investment drivers that are meant to provide financial benefits for a company. The drivers that aim to meet customers' demand and to develop competitive advantages are evaluated to be very important for the corporate willingness to invest in environmental schemes. Obtaining a price premium and collaborating with NGOs play a minor role. The experts explain the low importance of price premiums with the increasing number of customers that take corporate environmental activities as granted without being willing to contribute. This situation may occur especially in the field of business-to-business transactions, where the pressure of competition forces suppliers to be both cheap and eco-friendly. Likewise, collaborations with NGOs have only restricted influence on the environmental strategy of a company. Neither marketing possibilities nor avoiding negative effects due to NGO's campaigns are evaluated as crucial for protection measures.

Following the results, PACs should focus on customer needs and leadership advantages in order to create direct financial benefits. For instance, experts appreciate the idea of being able to select the protected area they invest in. This would allow them to flexibly meet the demands of their customers. Given a uniform certification scheme, customers can further compare the environmental engagement of compa-

nies. However, the experts emphasize that PACs have to be unique. Only when the certification scheme sufficiently differs from existing initiatives, companies will be able to establish competitive advantages. Generally, direct financial benefits must exceed the additional cost of investment.

Social legitimacy. The society increasingly sees it as a company's duty to take responsibility for its decisions and actions (Klassen and Whybark, 1999). Driven by the development of modern communication technologies, growing attention in public debate is paid to companies that fail to meet this demand (Aula, 2010). The factor social legitimacy aims to sustain the business of a company by creating a positive public perception. Legitimacy motives are also emphasized in the studies of Brønn and Vidaver-Cohen (2009). As a result of our exploratory factor analysis, three investment drivers are allocated to the factor social legitimacy. The creation of a positive public image is identified to be the most important of all drivers. The remaining two variables, considering the environmental concerns from employees and offsetting the corporate demand on nature due to moral incentives, are classified as drivers with medium importance.

According to the experts, PACs have a high marketing potential that can be used to improve the corporate reputation, and thus legitimize the business of a company. Yet, the credibility of the certification scheme is considered as a necessary condition to use PACs for legitimacy motives. Hence, attention has to be paid to the accurate verification of protected areas. Furthermore, experts are aware that an improvement of brand and corporate reputation can only be reached if companies are transparent about their whole CER strategy. Companies that use PACs to present themselves as more responsible than they really are, run the risk of losing their social legitimacy in the long run (Walker and Wan, 2012).

Eco-dependency. The capacity of the earth in terms of resource production and waste absorption is limited. At the same time, human pressure on ecosystems is increasing (Ewing et al., 2010; Rockström et al., 2009). For this reason, it is not surprising that nearly one in three companies stated to feel exposed to ecological risks. Compared to the survey results from the Carbon Disclosure Project that

were discussed earlier, these results are even low (CDP, 2012a/b). Nevertheless, the dependency on ecosystems as key motive for corporate sustainability is hardly discussed in literature. Koellner et al. (2010) consider the provision of natural resources as one possibility to gain direct financial benefits from the investment in ecosystem services. Other studies such as Brønn and Vidaver-Cohen (2009) just analyze the general prevention of future business problems as investment driver; but not ecological risks in particular. In our case, the factor eco-dependency is the reason for a company's exposure to ecological risks and its resource conservation activities. The dependency on ecosystems also partly explains the value companies allocate to functioning ecosystems. Resource conservation is a medium important investment driver for CER activities. When it comes to the evaluation of ecosystems, one in two experts stated that functioning ecosystems are important for their business.

During the expert interviews, it became clear that the sector of a company has a substantial impact on eco-dependency motives. For instance, all companies from the tourism industry value the average benefit provided from functioning ecosystems as very important, whereas all manufacturing companies believe that functioning ecosystems play a minor role for their business. The reason for this is obvious. Tourism operators have a special interest to protect ecosystems because the conservation of biodiversity and scenic beauty allows them to improve the quality of tourist experience; a necessary condition for their long-term business success. Companies in the manufacturing industry, though, are not confronted with such dependencies on ecosystems, and correspondingly evaluate functioning ecosystems as less important. These different dependencies on ecosystems are also evident when looking at stated business risks and resource conservation incentives; tourism operators feel more exposed to ecological risks than manufacturing companies and evaluate the conservation of natural resources as more important.

Most companies that stated to be interested in PACs have high ratings for eco-dependency motives. This leads to the assumption that the dependency on ecosystems is the main reason why companies would buy PACs. Through the development of protected areas, ecosystems are maintained and conserved, resource depletion is

avoided and ecological risks are reduced. Companies with global value chains, in particular, appreciate that PACs address global eco-dependencies. Furthermore, experts like the idea that PACs provide a bundle of different ecosystem benefits. This would allow companies to take care for a broad range of environmental aspects, without being obliged to engage in different investment schemes. The following sectors have both high eco-dependency values and a special interest in PACs: the tourism, retail, food and chemical industry. The only two sectors that are willing to buy PACs without high eco-dependency valuations are the energy and finance industry.

Internal pressure. Companies that pay attention to the requests of their internal stakeholders can often increase overall motivation; an important aspect in the growing competition for both capital and labor. Nevertheless, the factor internal pressure seems to be underrepresented in recent studies. Though scholars consider shareholder demands on corporate strategy, further distinctions between external and internal stakeholders are hardly made (Brønn and Vidaver-Cohen, 2009; Hahn and Scheermesser, 2006; Koellner et al., 2010). The interview results show that the wishes from shareholders and management have a high influence on the environmental strategy of a company. The requirements from employees are at least medium important. Shareholders and management are seen as opinion leaders that set the stage for CER activities. Experts committed that they often use their position as shareholder or manager to not only evaluate environmental issues from a company's perspective but also to make sure that their personal values are represented. According to the experts, corporate engagement in environmental protection could help to reach good positions in sustainability rankings such as the Dow Jones Sustainability Index and the Carbon Disclosure Project, and thus increase the confidence of shareholders in case new capital investors are sought. Due to the lack of skilled labor, more and more companies also start to consider the personal concerns of their employees when putting the corporate environmental vision into practice.

In order to strengthen the success of an international PAC market, internal stakeholders need to consider PACs as an appropriate instrument to solve global environmental problems. In a similar manner to the requests from external stake-

holders, it therefore has to be guaranteed that the verification of protected areas is based on a credible and transparent certification scheme. Only then will shareholders, management and employees urge their companies to introduce PAC investment into the core business.

Regulatory risks. A variety of environmental issues are regulated by local, national and international laws and guidelines. But also the expectation of future business obligations can persuade companies to operate sustainably (DiMaggio and Powell, 1983; Dummett, 2006). The interview results show that the anticipation of mandatory requirements becomes an important driver if the probability of future legislation is high. If final decisions on regulation are vague, companies stated to rather focus on achieving minimum standards. As a consequence, the variable compliance is located in the midfield of investment drivers.

PACs shall be purchased on a voluntary basis. Due to the complex valuation of ecosystem benefits, no development of a mandatory standard is expected in the near future. Mainly, the international orientation of the market will make it difficult to establish unique environmental targets. In the short term, legal drivers for PAC demand are therefore negligible. The more interesting it is that 39 per cent of the experts reported to prefer a mandatory market for PACs as corporate environmental protection would otherwise fall below the social optimum.

3.5.2 Methodological Limitations

The results of exploratory factor analysis depend on correlation data. As a consequence, relationships will be mistaken whenever correlations are spurious. Another problem of exploratory factor analysis is that the interpretation of factors is a very subjective matter. No clear rules exist for the labeling of latent variables. Labels also depend on the rotation technique as both factor loadings and eigenvalues change with the rotation method. Furthermore, an overfit of the data can lead to the creation of non-generalizable solutions. Last but not least, it needs to be considered that the number of extracted factors depends on the chosen technique. Hence, the correct number of factors might not be identified (Conway and Huffcutt, 2003; Gar-

son, 2013). In order to address these limitations and to confirm the results of the study, it is recommended to increase the sample size and conduct a confirmatory factor analysis. This would also allow examining sector specific influences in more detail. In addition, cross-validation can be used to enhance the robustness of data. With seven out of twelve communalities $< .6$ and less than six indicators per factor in the present sample, MacCallum et al. (1999) suggest collecting data from at least 300 companies to get stable and robust results. Since the outcomes of the conducted expert interviews are quite similar within sectors, it is however assumed that a smaller sample size might be sufficient for a sector specific analysis.

3.6 Conclusion

The goal of the study was to gather information about corporate drivers to voluntarily invest in protected areas and explore the basic structure of key motives for private sector investment. Additionally, opportunities and risks that are connected with an international PAC market were to be identified. With a focus on data quality rather than quantity, semi-structured expert interviews were considered as the appropriate method for data collection.

Combining the results of the exploratory factor analysis with the opportunities and risks that experts see in the development of an international PAC market, three key motives for ecosystem protection and conservation are addressed by PACs. First of all, buying land-based certificates would enable companies to establish a unique selling point, and thus gain direct financial benefits. Second, the investment in PACs is expected to create a positive public perception and lead to social legitimacy of business activities. Third, protected areas support the conservation of ecosystems, avoid resource depletion and reduce ecological risks; all aspects that relate to the eco-dependency of a company. The remaining two key motives, internal pressure and regulatory risks, have a rather small influence on PAC demand. Pressure from internal stakeholders is expected to stay low as long as the market is not fully developed. Regarding regulatory risks, it has to be considered that PACs are based on a voluntary certification scheme. Therefore, regulations do not play a role in the PAC

investment decision of companies. Of the three key motives that are addressed by PACs, eco-dependency motives are assumed to have the strongest influence on private sector investment. While a lot of different environmental protection measures exist that provide direct financial benefits and support legitimation issues, there is yet no mature certification scheme for the holistic conservation of geographical areas. This is why PACs provide those companies that have a high dependency on ecosystems with an attractive investment opportunity to secure their long-term business success.

The results of the study can be used to support the development of international certification markets such as REDD+ and VCA that seek private funding for the conservation of ecosystems. Basically, the article gives scientists and policy makers information about what investment drivers, opportunities and risks have to be considered for a successful launch of land-based certificates. Furthermore, the article sets the stage for a confirmatory factor analysis approach by making first assumptions about key investment motives. A possible direction for such an analysis could be the investigation of those sectors that reported to be willing to invest in PACs.

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4 Design principles for protected area certificates: A case study on strategic investor groups

Abstract

The biological capacity of the earth is limited. While this is obvious at first glance, it has been ignored for decades. Policy makers attempt to overcome the persistent depletion of the human livelihood base through the establishment of protected areas. However, the financial means to sustainably manage a representative network of protected areas on a global scale do not yet exist, and particularly private sector investment is extremely modest. One option for increasing private investment flows is the development of a market place for protected area certificates. This article utilizes semi-structured expert interviews with 39 German companies to analyze major product and market requirements for the sound implementation of an international certification scheme. Based on a triangulation approach that combines the two-step clustering procedure for strategic investor groups with qualitative methods, seven design principles are determined that might encourage voluntary investment funds from the private sector, and thus support the sustainable management of ecosystems. Having a look at existing markets for protected areas, one scheme stands out to come close to the defined design principles: the LifeWeb initiative.

Keywords: Protected areas, certification, payments for ecosystem services, cluster analysis, LifeWeb

4.1 Introduction

Human well-being depends on functioning ecosystems and their multiple provisioning, regulating, cultural and supporting services (Jax, 2010). Yet, the world's population growth combined with expanding industrialization leads to a situation in which more and more ecosystems are depleted. In fact, increasing habitat transformation, over-exploitation of resources and environmental pollution result in a continuing degradation of ecosystems and their economic value (Duraiappah and Naeem, 2005; Ewing et al., 2010). One solution to overcome this problem and secure human well-being is recognized to be the establishment of protected areas (Bertzky et al., 2012). The International Union for Conservation of Nature (IUCN) classifies protected areas as "clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values" (Dudley, 2008). The broad definition covers not only strictly protected sites, in which any human intervention is forbidden, but also includes areas traditionally used by local communities for their livelihoods (Dudley, 2008).

According to the Aichi Targets defined by the Convention on Biological Diversity (CBD) during the 10th meeting of its Conference of the Parties COP-10 held in Nagoya in 2010 "by 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas [...] are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas" (CBD, 2010). In 2012, about 14.6 per cent of the world's terrestrial area, 9.7 per cent of marine areas in coastal waters and 5.3 per cent of the global marine areas of potential national jurisdiction were covered by protected areas, with similar proportions in developed regions and developing countries (Jensen, 2013). In developing countries, though, ecosystems' provisioning services often constitute the livelihood base, particularly for the rural poor (CBD, 2008). This dependency causes high opportunity costs when it comes to the management of protected areas and makes it far too expensive for landholders to meet conservation targets without additional incentives (Ferraro, 2001; Karousakis and Brooke, 2010; TEEB, 2010).

So far, national states, NGOs and charities are the main donors for protected areas, while limited investment comes from private companies (Emerton et al., 2006). In sum, funding does not suffice to sustainably finance the management of existing sites, not to mention the conservation of new areas (Balmford et al., 2002; Bruner et al., 2004; Emerton et al., 2006). This explains the growing interest in the performance of more recently established market-based instruments (MBIs), which are expected to increase private sector investment and generate conservation finance in the long run (Mandel et al., 2010; Vatn et al., 2011; WWF, 2009). On the local level, namely payments for ecosystem services (PES) are already well established (IIED, 2007; Mwangi, 2008; Perrot-Maître, 2006; Stanton et al., 2010). International PES schemes, though, are still in their infancy (Carius, 2012; Karousakis and Brooke, 2010).

In order to bring forward emerging international initiatives such as REDD+ (Reducing Emissions from Deforestation and Forest Degradation) and VCA (Verified Conservation Areas) that are aimed at certifying sustainable land management practices, this article examines design principles for establishing an international market for protected area certificates (PACs). Basically, the article strives to answer the following two key questions. First, what product and market criteria are important for companies to invest in certified conservation areas? Second, what classification system of corporate investor types exists? Analyzing these two questions, the article not only helps scholars and policy makers to understand common design principles that are crucial to attract voluntary investment funds from the private sector but also indicates potential gaps that have to be addressed in improving current schemes.

4.2 Theoretical Background

The top 3000 listed companies globally were estimated to be responsible for US$ 2.15 trillion of environmental externalities in 2008 (UN PRI and UNEP FI, 2011). In view of that, the parties to the CBD have been exploring ways to enhance private sector engagement in achieving the overall goals of the Convention (CBD, 2014a). Voluntary market-based instruments like environmental performance standards, bio-

diversity offsets, permit-trading, and payments for ecosystem services intend to mitigate business' impact on the environment (Vatn et al., 2011). Instruments providing additional financial flows for biodiversity conservation are particular relevant in this respect (Parker et al., 2012). In general, little is known about the supply side of conservation finance and the opportunities and risks along the conservation investment value chain (Credit Suisse et al., 2014). Current studies, though, emphasize that the monetary and conservation benefits of existing projects are still not enough identified and standardized from an investor‘s perspective, and that there are too few salable projects (Credit Suisse et al., 2014; WEF 2013).

Verification and third party certification of projects' real social and environmental impacts might reduce the caution of investors (Bayon, 2004; Karousakis and Brooke, 2010; Kate et al., 2004). Typically, certification schemes aim to demonstrate that products, services or processes conform to specific performance metrics (Corsin et al., 2007). Regarding the establishment and management of conservation projects, certification can be used to verify if social and ecological best practices are applied and what conservation outcomes are realized (Meijaard et al., 2011). A closer look into existing environmental standards and good practices suggests that land-based concepts jointly considering the provision of ecosystem services, biodiversity conservation and poverty alleviation are obtaining a growing importance beyond single product and carbon centered projects (Peters-Stanley et al., 2013). This involves for example the revised Climate Community Biodiversity (CCB) Standard, the Climate Bond Standard, the Gold Standard's initiative on Climate Smart Agriculture (CSA) for smallholders, and the certification of Small and Low-Intensity Managed Forests (SLIMF) through the Forest Stewardship Council (FSC). By exploring an international market for PACs, we want to contribute to the debate on whether or not the certification of sustainable land management is able to scale up private sector investment. Since the PAC market is based on the PES idea, PES are discussed below before the conception of PACs will be introduced in more detail.

4.2.1 Payments for Ecosystem Services (PES)

PES aim to promote the protection and conservation of ecosystems that are crucial for human well-being (Greiner and Stanley, 2013; Karousakis and Brooke, 2010; Muradian et al., 2010). The basic idea behind PES is that users of ecosystem services pay for the benefits they obtain; including individuals, communities and businesses as well as third-parties like governments and institutions that act on the behalf of ecosystem service users (Karousakis and Brooke, 2010; Wunder, 2005). Based on the beneficiary-pays rather than the polluter-pays principle, PES provide an incentive measure that translates external values of ecosystems into direct financial means for the protection and conservation of those ecosystems (Engel et al., 2008). Generally, PES are defined as "a voluntary, conditional agreement" (Wunder, 2007). The conditionality criterion is crucial for the legitimacy of PES. Yet, as the output of payments in terms of ecosystem service provision is often difficult to observe, most PES schemes are premised on direct input-based payments that focus on investment in particular land management practices (Engel et al., 2008).

The application of PES is diverse, ranging from small local projects to broader international schemes (Karousakis and Brooke, 2010). This diversity is mainly due to the many design options for PES. In fact, it is not dictated which ecosystem services are to be protected or which payment and monitoring methods have to be realized. Moreover, PES can be flexibly adapted to the specific requirements of land management (Carius, 2012; Karousakis and Brooke, 2010). In developing countries, for instance, the desired environmental outcome is often connected with social goals such as poverty alleviation and rural development (Corbera et al., 2007; Corbera and Pascual, 2012). Considering the flexibility of PES, they also constitute an instrument to sustainably finance protected areas (Turpie et al., 2008; Wendland et al., 2010). The LifeWeb initiative that was established as part of CBD's Programme of Work on Protected Areas (PoWPA) shows how payments for protected areas can be secured on a global scale. The online platform provides a clearing house in which project developers convey their funding needs and donors get information about conservation projects (CBD, 2012; CBD, 2014b).

However, PES are not to be regarded as a panacea (Redford and Adams, 2009). Amongst other things, criticism is directed at the unequal distribution of social and economic outcomes and the disrespect of agreed principles such as the free, prior and informed consent (FPIC) of local communities (Goodland, 2004; Mwarabu, 2009; Springer and Retana, 2014). Furthermore, there are widespread discussions about the impact of commodification on complex ecosystems and their services (Kosoy and Corbera, 2010; Vira and Adams, 2009). For the applicability of PES programs, it is thus recommended to always consider the environmental, socio-economic as well as the political context of conservation projects (Jack et al., 2008; Kemkes et al., 2010). In the end, MBIs cannot replace governmental regulation, and explicitly PES programs are recently considered as "reconfiguration of state-market-community relationships" (Vatn, 2010).

4.2.2 International Market for PACs

Land-based certification is not a new concept and is particularly relevant for indigenous-run protected areas under community-based natural resource management (CBNRM) programs, and protected areas managed according to IUCN categories V (protected landscape / seascape) and VI (protected area with sustainable use of natural resources) (Dudley, 2003; Sperling and de Kock, 2010). Yet, international markets for land-based certificates, which aim to develop resilient conservation finance, are in the very beginning of conceptualization and need further research as well as empirical evidence obtained from pilot projects (Carius, 2012; Parker et al., 2009; Vorhies, 2013). For this reason, we looked more closely at the conception of a market place for PACs; to be understood as an institution governing the certification of conservation projects.

The PAC market is designed according to the governance and certification schemes of voluntary carbon markets, in which companies buy credits to offset their greenhouse gas emissions (Peters-Stanley and Yin, 2013). PACs, though, focus on the beneficiary-pays principle. In other words, companies that depend on the capitalization of ecosystem services are expected to pay for the development and management of protected areas that are certified to provide these services. Basi-

cally, PACs are issued for geographical areas managed in accordance with social and environmental best practices that are in line with the objectives laid down by the CBD and United Nations Development Programme (CBD, 1992; UNDP, 2014). For instance, the following globally accepted standards could be used as benchmarks: CBD's Ecosystem Approach; the SAFA guidelines of the Food and Agriculture Organization (FAO) of the United Nations; REDD+ Social and Environmental Standards; or FSC certification for well managed forests. When buying PACs, companies can choose what kind of protected area they want to financially support (e.g. country of origin, provided ecosystem benefits). The purchase of certificates may, however, not be confused with the acquisition of land property rights but shall be rather interpreted as a safeguard for best practices on particular areas.

4.3 Methods and Data

We utilize data derived from expert interviews with representatives from German companies of which parts have already been analyzed in Meißner and Grote (2014). In total, 253 experts in the field of corporate environmental responsibility were invited to participate in the survey. Table 4.1 gives an overview of the invited industries under the NACE Rev. 2 code and their share in the final sample. The response rate amounts to 15 per cent with 39 experts being interviewed in the period from August 2012 to January 2013. Most experts are managing directors of their company (31%) or employed as environmental or sustainability representatives (49%). The majority of interview partners have the authority of making decisions on environmental investment (63%). Regarding the company size, the survey participants can be almost equally divided between small $<$ 49 employees (36%), medium sized with 50–2499 employees (31%) and large enterprises $>$ 2500 employees (33%).

The interviews were conducted in a semi-structured format and experts were asked to answer all questions from their company's perspective. Standardized questions were used to evaluate corporate benefits derived from functioning ecosystems, the exposure to business risks that stem from the depletion of ecosystems as well as the required framework for an international PAC market. Experts were invited to

quantify their answers on a seven-point Likert scale. In addition, guided but non-standardized questions allowed experts to share their experiences with mandatory and voluntary certification schemes, and further explain the investment behavior as well as product and market requirements of their company.

Industry sector	Initial sample		Final sample	
	Percentage	No. of companies	Percentage	No. of companies
C: Manufacturing (except C10/C11/C20)	19.8 %	50	17.9 %	7
C10/11: Food products and beverages	19.0 %	48	10.3 %	4
C20: Chemicals and chemical products	9.9 %	25	5.1 %	2
D: Electricity, gas, steam and air conditioning supply	7.1 %	18	7.7 %	3
G: Wholesale and retail trade	6.7 %	17	5.1 %	2
H: Transportation and storage	6.3 %	16	5.1 %	2
M-N/Q/S: Service activities (except N79)	11.9 %	30	15.4 %	6
N79: Travel agency, tour operator and other reservation service and related activities	5.9 %	15	25.6 %	10
Others	13.4 %	34	7.7 %	3
Total	100.0 %	253	15.4 %	39

Note: Sector classification follows the Statistical Classification of Economic Activities in the European Community (NACE Rev. 2), 2008

Table 4.1: Sector classification of companies in the initial and final sample

We use a triangulation approach for data analysis to combine the advantages of quantitative and qualitative methods. First, qualitative content analysis helps us in getting to know more about the experiences companies have with environmental certification schemes. Due to the similarities between PACs and emission offsets, we particularly focus on experiences companies have with mandatory and voluntary carbon markets. Afterwards, the required framework for an international PAC market is defined based on descriptive statistics and qualitative results. Last but not least, we apply a two-step cluster analysis with log-likelihood distance measure in order to create a taxonomy of PAC investors and non-investors using both categorical as well as continuous data (Garson, 2012).

Investor groups are characterized by internal cohesion and external isolation (Cormack, 1971). The number of clusters is determined by the Bayesian information criterion (Schwarz, 1978). To adjust the final number of extracted clusters,

we use the silhouette coefficient of the model, the relative contribution of clustering variables to the estimation of PAC investment types as well as the meaningfulness of the cluster solution (Backhaus et al., 2003; Garson, 2012; Kaufman and Rousseeuw, 1990). The homogeneity of clusters is evaluated according to the F value that displays the ratio of the within-group variance of one variable to the total variance of the whole sample. Aiming to label the extracted clusters, t values are examined that indicate if a clustering variable is over-/underrepresented in comparison to the overall data set.

Typically, two-step cluster analyses are based on large data sets. For small samples the method shows a strong dependence upon the sequence of observations (Garson, 2012). Thus, a robustness check of the cluster solution is compiled; including a randomization of cases and a comparison of strategic groups with those resulting from hierarchical algorithms. As hierarchical algorithms are not applicable for categorical data, in these cases, the sample is divided into corresponding pre-clusters.

4.4 Results

In total, 38 per cent of the experts reported that their company would buy PACs. When it comes to the experience that companies have with existing carbon markets, 8 per cent of the experts stated to buy emission certificates in order to comply with mandatory emission reductions. Regarding voluntary carbon markets, 36 per cent of the companies invest in offsets derived from the certification schemes of the Gold Standard and Verified Carbon Standard. The share among companies that would invest in PACs even amounts to 53 per cent. Altogether, experts agree that the importance of voluntary certification schemes is increasing as homogeneous obligations on a global scale are too complex to build and sustain in the long run. Nevertheless, there is also consensus that environmental offsetting schemes can only be second best solutions. First, companies have to avoid and mitigate their impact on nature.

Some companies have already developed a business case for emission offsets that could be adapted for PACs. Basically, these companies have the possibility to for-

ward a part of their certification costs to customers that are willing to pay a higher price for eco-friendly products. In a similar manner to the experience rate in voluntary carbon markets, the share of companies that have developed a business case is higher among PAC investors (60%) than in the overall sample (39%). The results are summarized in Figure 4.1.

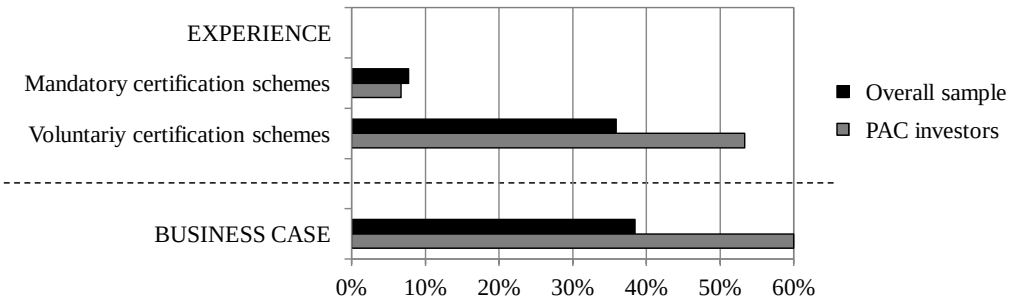


Figure 4.1: Companies prepared to move early into the PAC market

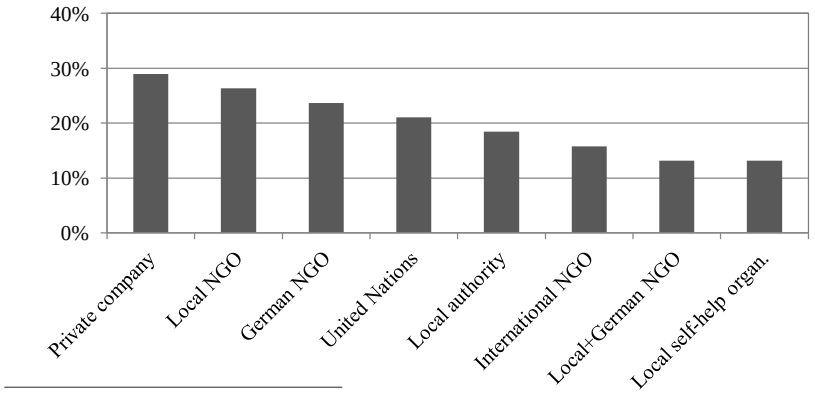
4.4.1 Framework of an International PAC Market

In order to define the required PAC market framework, ten different criteria were discussed during the expert interviews. The product and market criteria were quantified on a seven-point Likert scale with the end points '1: not important' and '7: extremely important'. The mean values and standard deviations as well as the top box results are shown in Table 4.2. Almost all experts identified the transparency of the certification scheme as crucial condition for PAC demand; followed by the traceability of certificates, the credibility of certification bodies and project developers, the installation of a supervisory body and substantial monitoring efforts. Furthermore, about three quarter of the experts stated that the origin and additionality of certificates would play an important role for their investment decision. In contrast, the development of a trading system and the expectation of positive price developments are of minor importance.

Variable	Explanation	Mean	S.D.	Top-box % (Score 5-7)
Transparency	Transparent certification scheme	6.66	0.63	97.4
Traceability	Certificates can be assigned to protected areas and ecosystem benefits	6.53	1.37	94.7
Certification body	Credible and trustworthy certification body	6.53	1.01	94.7
Project developer	Credible and trustworthy project developer	6.53	1.20	92.1
Supervisory body	Installation of a supervisory body	6.43	1.14	91.9
Monitoring	Frequent monitoring of protected area management and conservation outcome	6.08	1.32	89.2
Origin	Possibility to choose the geographical origin of the protected area	5.27	1.94	75.7
Additionality	Improvement of the conservation status of ecosystems compared to the baseline scenario	5.39	1.77	72.7
Trade	Development of a PAC trading system	3.43	2.21	32.4
Price	Expectation of positive price developments for PACs	2.97	1.94	24.3

Table 4.2: Required PAC market framework (N=38)

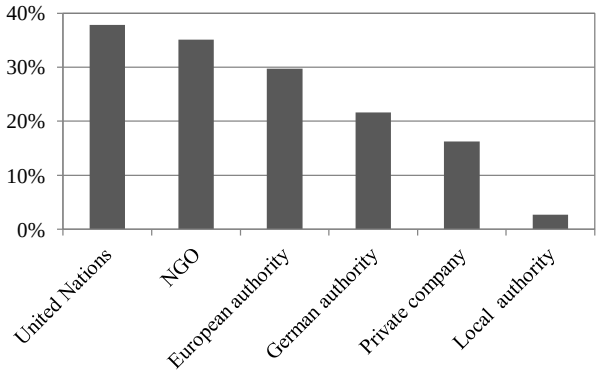
Being asked what type of project developer would be preferred for the establishment and management of protected areas, experts named private companies. On the one hand, private companies are expected to be close to the customer; resulting in high availability ratios and fast processes. On the other hand, private companies could be flexibly chosen according to the expertise that is required in a certain protected area. Furthermore, local as well as German NGOs are evaluated to be trustworthy and credible project developers. In comparison to international NGOs, the regional alternatives are seen as more transparent about their land management practices. NGOs from the country of origin are also appreciated because of their local expertise, while German NGOs are expected to have a better reputation in the public, at least in Germany. Some experts think that a collaboration between local and German NGOs would provide optimal establishment and management of protected areas. An overview of all named project developers is given in Figure 4.2.



Note: Multiple answers were possible.

Figure 4.2: Who should establish and manage protected areas? (N=38)

All experts agree that a supervisory body is needed that is responsible for the registration of projects, the issuance of certificates and the accreditation of certification bodies in the PAC market. Preferred supervisory body are the United Nations. First, an international authority would be required to cope with international projects. And second, the United Nations are already experienced in supervising the global mechanisms of the Kyoto protocol. Furthermore, NGOs are seen as adequate. Experts appreciate that NGOs work faster than public authorities and that they are usually more transparent than private companies. In case of European and German authorities, a better adaptation to culture specific requirements is expected. Figure 4.3 summarizes the results for proposed supervisory bodies.



Note: Multiple answers were possible.

Figure 4.3: Who should supervise the international PAC market? (N=37)

4.4.2 PAC Investor Types

We conduct a two-step cluster analysis with log-likelihood distance measure. The clustering variables are chosen according to Meißner and Grote (2014) who apply an exploratory factor analysis approach to identify key motives for private sector investment in ecosystem conservation projects. Following the results of the study, the factor corporate dependency on ecosystems is assumed to have the biggest influence on companies' willingness to invest in protected areas. Meißner and Grote (2014) describe the factor by three different indicators: the importance of functioning ecosystems for the business of a company; the exposure to business risks that stem from the depletion of ecosystems; and the incentives to protect ecological resources that a company needs for its production.

It is important to remember that PACs do not grant any property rights. Hence, a company cannot improve its access to land and other resources by purchasing PACs. As a consequence, we only use the two variables *ecosystem* and *business risks* to describe the ecological dependency of companies. While the evaluation of the variable business risks was directly requested in the interview, the importance of functioning ecosystems is calculated as the average value experts appointed to four ecosystem benefits: food security, scenic beauty, preservation of cultural services and biodiversity conservation. Obviously, there are more benefits that can be derived from functioning ecosystems (e.g. carbon sequestration, water-related services). The selected aspects, though, support a clear distinction between protected areas and other environmental conservation measures, such as carbon offsets or water stewardship programs.

In addition, we consider the categorical variable *business case* as important to cluster strategic investor groups. We believe that PAC investment not only relies on the corporate dependency on ecosystems but also whether or not companies can forward certification costs to their customers. An overview of the clustering variables and their value range is given in Table 4.3. Due to incomplete data records, six interviews were not used for the analysis. According to Formann (1984) a sample size of at least 2^k, preferably $5 * 2^k$, is needed to ensure valid cluster solutions with k

= number of clustering variables. With 33 interviews and three clustering variables the data set is suitable for cluster analysis.

Variable	Explanation
Ecosystem	Importance of functioning ecosystems for the business of a company
	Seven-point scale: '1: unimportant' to '7: extremely important'
Business risks	Exposure to risks that stem from the depletion of ecosystems
	Seven-point scale: '1: no risk' to '7: very high risk'
Business case	Development of a business case for PACs
	yes: a business case for PACs exists
	no: no business case for PACs exists

Table 4.3: Clustering variables

Before running the two-step cluster analysis, the sample is divided into two pre-clusters of investing and non-investing companies. In the following, companies that stated to be willing to invest in PACs and companies that admitted to have no incentive to buy PACs are analyzed separately. According to the Bayesian information criterion two clusters should be extracted for both subsamples. In the four-cluster solution the categorical variable business case is used to separate investor groups. The corresponding mean values and standard deviations for the two continuous variables business risks and ecosystem are displayed in Table 4.4.

		Business case	Ecosystem	Business risks	No. of companies
Investors	Cluster 1	yes	5.00 (0.67)	3.13 (2.53)	8
	Cluster 2	no	5.40 (1.10)	3.00 (2.83)	5
Non-investors	Cluster 3	no	2.67 (1.35)	2.88 (2.31)	16
	Cluster 4	yes	5.88 (0.48)	4.75 (2.22)	4

Table 4.4: Four-cluster solution: mean values with standard deviations in parentheses

The distribution functions indicate that ecosystems are of similar importance for all companies that are classified as investors. The exposure to business risks, though, is varied within cluster 1 and 2. The silhouette coefficient for the subsample of investors equals 0.4, indicating weak evidence for the cluster model. In order to improve the model fit the number of clusters is increased. The results show that

the investor group's silhouette coefficient reaches its maximum if four clusters are extracted. With a value of 0.6 the model fit is good and cases cannot be located closer to their cluster center. For the subsample of non-investors, the distribution functions show that cluster 3 and cluster 4 are well separated in terms of ecosystem importance. However, in a similar manner to the initial solution for investors, the exposure to ecological risks is widely dispersed within the clusters. The initial silhouette coefficient for the subsample of non-investors equals 0.6. Assuming that business risks do also play an important role in differentiating non-investing companies, the number of clusters is increased. The maximum silhouette coefficient of 0.7 is reached with the extraction of three clusters. Consolidating the results, four investing and three non-investing clusters are identified. The mean cluster centers and standard deviations of the seven-cluster solution as well as the F and t values of the clustering variables are shown in Tables 4.5 and 4.6. According to the Kruskal-Wallis test there is a significant difference ($p < .01$) in the mean levels of the cluster groups for all indicators.

In the first column of each table, the F and t values are displayed that result from a comparison of the pre-cluster data with the overall sample of expert interviews. In the remaining columns the data of specific investor types are compared with the overall sample. The two subgroups of investors and non-investors are nearly homogeneous as all F-values are smaller or close to 1. Investors tend to score the value of functioning ecosystems higher than the overall sample (t = 0.51), while non-investors have smaller ratings for functioning ecosystems (t = -0.36). On average, there are no strong differences regarding the business risks investors (t = -0.08) and non-investors (t = 0.06) feel exposed to.

Among investors, companies within strategic group A feel less exposed to ecological risks (t = -0.72). Nevertheless, these *leaders* have already developed a business case that allows them to implement PACs into their existing product portfolio of eco-friendly solutions. Both strategic group B and C cluster those companies that have a strong focus on risk mitigation when it comes to environmental commitment (t = 1.21). Whereas companies in group B are named *economic risk mitigators* be-

cause they have the possibility to forward a part of the occurring certification costs to their customers, companies of group C are only called *risk mitigators* as they have to bear the occurring costs all by themselves. The last subgroup of investing companies D is labeled as *environmentalists*. These companies feel neither exposed to ecological risks (t = -0.89) nor do they have a viable investment scheme for any kind of environmental certificate. They invest in PACs because they highly appreciate the value of functioning ecosystems (t = 0.92).

Variables		Investors			
		Business case = yes		Business case = no	
		Leaders (A)	Economic risk mitigators (B)	Risk mitigators (C)	Environmentalists (D)
Ecosystem	5.15 (0.84)	5.00 (0.87)	5.00 (0.25)	5.13 (0.18)	5.58 (1.51)
F value	0.59	0.24	0.02	0.01	0.71
t value	0.51	0.59	0.59	0.66	0.92
Business risk	3.08 (2.53)	1.40 (0.89)	6.00 (1.00)	6.00 (1.41)	1.00 (0.00)
F value	1.10	0.14	0.18	0.35	0.00
t value	-0.08	-0.72	1.21	1.21	-0.89
Number of companies	13	5	3	2	3

Table 4.5: Investors: mean values with standard deviations in parentheses

Variables		Non-investors		
		Business case = yes	Business case = no	
		Skeptics (X)	Restricted beneficiaries (Y)	Free riders (Z)
Ecosystem	3.31 (1.79)	5.88 (0.48)	2.19 (1.18)	4.13 (0.43)
F value	1.01	0.07	0.44	0.06
t value	-0.36	1.08	-0.99	0.10
Business risk	3.25 (2.36)	4.75 (2.22)	1.67 (0.78)	6.50 (1.00)
F value	0.98	0.87	0.11	0.18
t value	0.06	0.68	-0.61	1.42
Number of companies	20	4	12	4

Table 4.6: Non-investors: mean values with standard deviations in parentheses

Besides the four groups of investing companies, we identify three different types of non-investors. Companies of group X have developed a business case for environmental certificates. At the same time, they highly appreciate the benefits of ecosystems (t = 1.08). Nonetheless, *skeptics* have no incentive to invest in PACs.

This leads to the assumption that they are not convinced from the certification scheme in general. *Restricted beneficiaries* that are part of group Y have no incentive to invest in PACs as they scarcely rely on the outcomes of ecosystems. As a result, they report little appreciation of functioning ecosystems (t = -0.99) and small ratings for business risks (t = -0.61). Companies within strategic group Z perceive the highest exposure to ecological business risks within the pre-cluster of non-investors (t = 1.42). However, they are not willing to invest in PACs. Therefore, they are defined as *free riders*. Figure 4.4 displays the different investor types according to the clustering variables ecosystem, business risks and business case. While the black markers represent the strategic groups, the white markers define combinations of variables that do not exist in the sample.

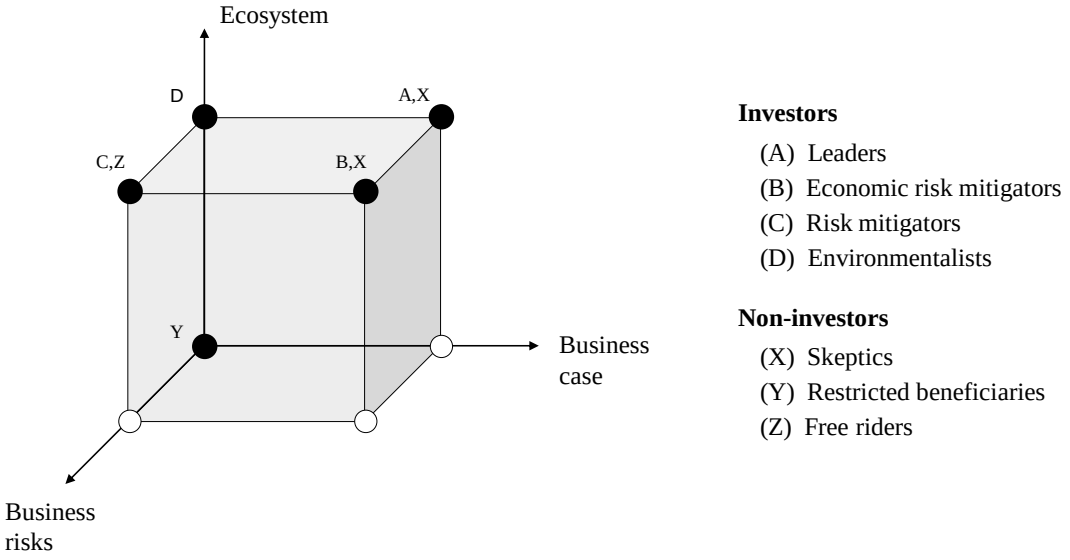


Figure 4.4: Strategic investor groups

4.5 Discussion

The results support the identification of PAC design principles that need to be considered to attract voluntary investment from private companies. To begin with, four general design principles can be defined according to the PAC market framework that companies reported to require for investment in protected areas. Afterwards,

the developed taxonomy of companies can be used to formulate three further design principles that apply for specific investor types.

(1) PACs have to be credible.
In other words, companies must be certain that their investment has a positive impact on ecosystem sustainability and that measures are in compliance with defined standards. This includes the avoidance of leakage; that is the development of protected areas must not lead to an increased depletion of ecosystems in neighboring areas that do not fall under the certification scheme. Credibility as a prerequisite for certification is generally accepted (Bratrich et al., 2004; Bräuer et al., 2006; Giovannucci and Ponte, 2005; ISEAL, 2013; WWF, 2006). In fact, companies that want to be recognized for their commitment need to be sure that they make a real impact on nature. Any non-credible marketing activities could easily damage corporate reputation (Jahn et al., 2005; Klewes and Wreschniok, 2010). Scientists agree that the credibility of schemes can be enhanced if certification is provided by independent third parties, and regular monitoring, reporting and verification activities are in place (Anders et al., 2010; Bayon, 2004; Eden, 2009; Karousakis and Brooke, 2010; Kate et al., 2004).

In a survey on the demand side of land-based carbon projects conducted by the Climate, Community & Biodiversity Alliance together with Conservation International (CCBA, 2012), companies stated to rely on professional partners to handle local management issues. Big commodity buyers also reported to get directly involved at a local level in order to secure the profitability of projects themselves. In our study, experts trust private companies, local and German NGOs when it comes to the management of protected areas. However, they also evaluate regular monitoring, reporting and verification of conservation projects by independent third parties as important to strengthen the credibility of PACs. In a global scheme, the accreditation of these independent third parties to the PAC standard is preferred to be granted by an international organization such as the United Nations.

(2) PACs have to be transparent.

For companies it is not only important to get sufficient information about the applied certification scheme but also that this information is easy to understand. There is broad consensus about the importance of transparency in certification schemes and the monitoring, reporting and verification system (CCBA, 2012; European Commission, 2010; Fry, 2011; Ugarte et al., 2013). Often transparency is seen as a necessity for the credibility of standards (ISEAL, 2013; KfW, 2012). Regarding the PAC market, procedural guidance for the certification of protected areas including indicative timelines as well as environmental and social objectives should be clearly defined and accessible to the public. Furthermore, information about the actual certification process and its outcome should be made available so that PAC buyers, the local community and other stakeholders have the possibility to continuously track the status of the protected areas and express any concerns if necessary. Basically, a transparent process from the first validation of geographical areas until the final issuance of PACs is required to enhance private sector investment.

(3) PACs have to be efficient.

Most companies would only invest in PACs if the criterion of additionality is met. Thus, the conservation status of ecosystems due to the certified development and management of protected areas must be improved compared to the absence of PACs. This requirement leads to the problem that certification might not be applicable for small areas owned by local communities. According to Wunder (2005), smallholders are often too poor to significantly damage ecosystems. Hence, their land use practices do not constitute a global threat to nature. In other words, transforming their land into protected areas creates little or even zero additionality. In fact, only 18 per cent of the companies stated to consider PACs as an additional source of income for the local poor.

There is much debate about 'pro-poor conservation' and the trade-offs and synergies of biodiversity conservation and poverty alleviation (Adams et al., 2004; Kaimowitz and Sheil, 2007; Roe and Elliott, 2006; Sachs and Reid, 2006; Wunder, 2008) as well as about the 'poverty-environment trap' (Barrett, 2008; Gray,

2011). While PES are not necessarily designed as pro-poor (Engel et al., 2008), they can have positive impacts on poverty reduction (Milder et al., 2010; Pagiola et al., 2005). However, this frequently comes at the cost of environmental efficiency (Wunder and Börner, 2013). Developing an international market for PACs, the main goal is to meet the demand of private companies. For this reason, the majority of certified projects should focus on the efficient conservation of ecosystems; but this must not come at the cost of socio-economic best practices. Whenever possible, projects need to be complemented with social benefits for the local people.

(4) PACs have to be flexible.
Needs of companies are varied. If companies buy PACs in order to satisfy the demand of their customers, individual requirements become even more important. Thus, companies appreciate having the opportunity to choose the protected area they invest in. Furthermore, it is important that the investment volume can be determined in a flexible manner. Small and medium sized enterprises raised the concern that they are not able to provide the financial means for the management of one area alone. Other companies stated to prefer investing in different conservation projects at the same time. In many cases, flexibility is described as a measure to increase private sector investment in biodiversity conservation (Bishop et al., 2008; Bräuer et al., 2006; Cortex Consultants, 2009; Kate et al., 2004). Nevertheless, studies lack to explain how flexibility can be transformed into concrete design principles for land-based certificates.

In addition to the free selection of the origin and type of protected areas, we recommend to develop PACs on the basis of small area units. The smaller the area unit, the smaller the price for one PAC and the more flexible investments can be made. This does not mean that companies want to trade PACs. On the contrary: once bought, companies would keep the certificates for themselves or their customers. As a consequence, neither the establishment of a trading system nor the expectation of positive price developments do play an important role for private sector investment.

(5) Leaders: PACs have to be easily and quickly accessible.
Although their business is not threatened by the depletion of ecosystems, leaders are willing to invest in innovative solutions that allow them to extend their eco-friendly product portfolio. Companies that are classified as leaders would invest in PACs due to their customer demand. Basically, they would buy PACs whenever there is a direct inquiry from their customers. For example, investment fund providers and sustainability agencies are identified to be leaders. For them, a PAC market must be easily and quickly accessible. Only if fast administrative processes are ensured, can they satisfy the needs of their customers on demand.

McMillan (2002) emphasizes the importance that buyers and sellers get together and exchange information about goods and prices. He points out the fact that markets can only work efficiently if information is evenly distributed. The development of such an 'investment-ready' structure is also stressed in Bayon (2004) as well as in Lambooy and Levashova (2011) in the context of environmental markets. In order to facilitate easy and quick access to PACs, we suggest to establish an online clearing house. Such a platform would allow project developers to promote their conservation activities and donors to get all the investment information they need. An integrated online purchasing system would further lead to a situation in which companies can satisfy the PAC demand of their customers from anywhere at any time.

(6) (Economic) risk mitigators: PACs have to be divided into different categories.
Risk mitigators see environmental investment as a necessary condition to sustain their business; with economic risk mitigators being able to forward at least a part of the costs to their customers. Companies identified as risk mitigators are, for instance, food producers and retailers. Due to their agricultural supply chains, these companies strongly depend on the services and raw materials provided by healthy ecosystems; most of their customers, though, would not pay a price premium for sustainably produced goods. Tourist operators that specialize in eco-friendly journeys constitute an example of economic risk mitigators. Like all tourist operators, they have a special interest in ecosystems because scenic beauty and biodiversity are

crucial for the success of their business. Ecotourism companies, however, also have the opportunity to forward PAC costs to their environmentally aware customers who are usually willing to offset their travel-based impact on nature.

In comparison to leaders that focus on customers' needs, (economic) risk mitigators choose PACs according to their potential to minimize business risks. Thus, uniform bundling of ecosystem benefits into one certificate as a mean to reduce transaction costs and monetize abstract benefits such as biodiversity conservation (Deal et al., 2012; Landell-Mills and Porras, 2002; Robertson and Wunder, 2005; Wendland et al., 2010), constitutes a disadvantage for (economic) risk mitigators. For them, it is of great importance to know the exact influence protected areas are expected to have on their long-term business success. In recent literature, it is widely acknowledged that main goals must be clearly defined for every conservation project (Karousakis and Brooke, 2010; Kate et al., 2004; WBCSD, 2010). This is also important for PACs. We propose to classify PAC goals according to ecosystem benefit categories (e.g. carbon sequestration, water-related services, food security, scenic beauty, biodiversity conservation). Doing so investors can directly see what kind and what level of ecosystem benefits are provided. Together with other project data such as the country of origin and overall investment volume, this information may be stored in a database that will allow companies to easily find projects relevant to their needs.

(7) Environmentalists: PACs have to be of global importance.
Environmentalists are hardly affected by ecological risks. Nonetheless, they highly appreciate functioning ecosystems. Companies that belong to the investor group of environmentalists would only support those conservation projects, they think to be the most valuable. For them, it is important to understand the added value of PACs compared to other environmental certification schemes and charity initiatives. Environmentalists are not found in specific sectors. Moreover, commitment to the environment is a result of the personal opinion of internal stakeholders (e.g. shareholders, management and employees). Previous studies emphasize the importance to evaluate the net benefit of environmental projects (Bräuer et al., 2006; Karpow-

icz et al., 2009; Lambooy and Levashova, 2011). Regarding the PAC market, one approach to address the concerns from environmentalists is to provide a detailed description of all ecosystem benefits resulting from protected areas that are considered for certification, and point to global impacts on nature.

Of the non-investing companies, the group of skeptics might be persuaded to buy PACs in the long run. Currently, their main reason to decide against PAC investment is that they question the credibility of the certification scheme. They doubt that PACs are able to mitigate their ecological business risks and are uncertain if their customers would pay a price premium for PACs. When the market is well established and high quality projects are developed, skeptics may turn to leaders or economic risk mitigators. However, neither restricted beneficiaries nor free riders will play a part in the PAC market. While the business of restricted beneficiaries does hardly depend on functioning ecosystems, free riders will only invest in ecosystem sustainability if they have to comply with mandatory regulations. Restricted beneficiaries are companies in the manufacturing, transport and logistics as well as in the service sector. These companies are not confronted with strong eco-dependencies, and thus show little appreciation for ecosystem benefits. Free riders, on the contrary, can be found in all sectors. In a similar manner to environmentalists, free riding is estimated to evolve from the personal attitude of internal stakeholders toward nature.

4.6 Conclusion

An international PAC market is seen as one solution to raise the willingness of companies to invest in the development and management of protected areas. In order to support this idea, semi-structured expert interviews were conducted with German companies; allowing the authors to discuss the required market framework and to cluster strategic investor groups. In total, there are four different investor groups: leaders, economic risk mitigators, risk mitigators and environmentalists. At the same time, three non-investing clusters can be distinguished: skeptics, restricted beneficiaries and free riders. Summarizing general as well as investor type specific

product and market requirements, there are seven important design principles for land-based certification schemes. According to these design principles, PACs have to be (1) credible, (2) transparent, (3) efficient, (4) flexible, (5) easily and quickly accessible, (6) divided into different categories and (7) of global importance.

The first four design principles describe general requirements for corporate PAC demand: a credible standard as well as a transparent certification scheme exist; only those protected areas are certified that are efficient in terms of ecosystem sustainability; and flexible investment opportunities are available that allow companies to not only chose the origin and type of protected areas but also the overall investment amount. The remaining three design principles are based on investor type specific requirements: companies identified as leaders call for easy and quick market access; (economic) risk mitigators would appreciate a classification of PACs into different ecosystem benefit categories; and environmentalists are mainly interested in the depiction of the global importance of protected areas.

Having a look at existing markets for protected areas, one scheme stands out to come close to the defined design principles: the LifeWeb initiative hosted by CBD. First of all, the LifeWeb initiative facilitates flexible funding. Donors can individually decide about the investment volume. The aggregated amount of donations and the missing investment for each suggested conservation project can then be viewed on the initiative's website. Furthermore, the online platform provides investors with details on current projects; including information about objectives and expected results, the timeframe, social and ecological contributions and the institutional context. To identify relevant LifeWeb projects, investors also have the possibility to filter protected areas according to the country, funding status, ecosystem benefits, the year in which the project was submitted and the total amount of required funding (CBD, 2014b). However, the current LifeWeb does not provide any certification system for supplied projects. Once projects have been matched, they are not further monitored and neither management practices nor project outcomes are verified. This is in contrast to the credibility and efficiency criteria requested by all investor types.

Regarding the development of a PAC market, we recommend to build upon the LifeWeb initiative and establish an additional category of certified conservation projects that issue land-based certificates. In order to create an attractive investment platform for private companies, we further suggest expanding the website and installing a click and buy system for online certificate orders. This would ensure easy and quick access to PACs. In addition, categorizing certified areas according to the sector of a company could be of value. Entering their sector, companies could directly be forwarded to projects that minimize their ecological business risk (e.g. sustainable management of national parks for tourist operators). This would further simplify the identification of relevant projects for companies that have dealt only little with ecosystem sustainability so far.

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5 Protected area certificates: A critical evaluation of their potential to create 'win-win' solutions in Tanzania

Abstract

Certification is considered to be one option to improve the effectiveness of protected area management in developing countries, and thus increase private funding for ecosystem conservation projects with international importance. In order to contribute to the current discussion on global, land-based certification schemes, this article critically evaluates the potential of a market place for protected area certificates (PACs) to create 'win-win' solutions for private investors in industrialized economies as well as stakeholders in developing countries. To this purpose, two recent studies on the demand and supply side of an international PAC market have been conducted and combined. The demand side is described on the basis of expert interviews undertaken with representatives from German companies. The supply side is examined by using interviews with protected area experts and key decision-makers in Tanzania. Combining the results of the studies, two challenges are identified to be of major importance for the sound implementation of a PAC market. First, protected areas should focus on efficiency targets rather than on poverty alleviation to attract investment from the private sector. And second, the political and institutional conditions in potential PAC supply countries are required to improve the investment climate by reducing bureaucracy, mismanagement and corruption.

Generally, re- or afforestation projects in Tanzania's tourist areas are revealed to be most suitable to generate PACs.

Keywords: Protected areas, certification, payments for ecosystem services, Tanzania

5.1 Introduction

Functioning ecosystems and their multitude of provisioning, regulating, cultural and supporting services are the basis for the well-being of humans (Jax, 2010). However, more and more ecosystems are destroyed or irreversibly transformed all over the world (Duraiappah and Naeem, 2005; Ewing et al., 2010). Not only do local communities lose their livelihood once ecosystems are completely depleted (Mainka et al., 2005), numerous private companies also depend on the benefits provided by nature in various ways. Without biodiversity and scenic beauty, for example, tourism operators are likely to lose their bases; natural medicines and biochemicals are often essential for pharmaceutical companies; and seed and breeding companies strongly depend on genetic resources (Hanson et al., 2012; Lambooy and Levashova, 2011).

Protected areas are one spatial and organizational land use planning instrument to conserve ecosystems of global importance and to sustainably use their resources (Bertzky et al., 2012; Duraiappah and Naeem, 2005). According to the International Union for Conservation of Nature (IUCN) a protected area is a "clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values" (Dudley, 2008). The idea to maintain ecosystems through the development of protected areas is nothing new but a universal concept that has evolved over time around the world (Chandran and Hughes, 2000; Eagles et al., 2002). There are currently more than 210,000 protected areas worldwide ranging from strictly protected sites without any human intervention to conservation

areas and territories managed for the sustainable use of natural resources; and their number and size are continuously growing (WDPA, 2014). This trend is likely to continue in the near future. During the 10th meeting of the Conference of the Parties COP-10 held in Nagoya in 2010, the Convention on Biological Diversity (CBD) defined the Aichi Targets with the strategic goal that "by 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas [...] are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas" (CBD, 2010). Global concerns on climate change underline the need for concerted efforts in this direction (Dudley et al., 2010). Most protected areas in developing countries, however, face major structural and prolonged problems in their effective implementation. Although an impressive number of protected areas have been legally established in Africa, Asia and Latin America, many of them are not able to conserve the natural and biological resources they contain - and to meet their own raison d'être (Duffy, 2006; Setsaas et al., 2007; Wilkie et al., 2001).

Available funding does not suffice to tackle these problems and sustainably manage existing sites (Balmford et al., 2002). This becomes even more problematic as number and size of protected areas are rising, along with costs related to increased governance complexities. State and donor funding opportunities do not keep pace with this trend and the discrepancy between required and available funds is likely to increase in the future (Emerton et al., 2006; Jenkins et al., 2004; Scherr et al., 2010). Developing countries, in particular, lack capital to meet conservation costs (Balmford et al., 2003). The costs for the effective management of all existing protected areas in developing countries are estimated between US$1.1 billion to US$2.5 billion per year with a current funding gap of US$1 billion to US$1.7 billion per year (Bruner et al., 2004; James et al., 1999; James et al., 2001; Vreugdenhil, 2003). At the same time, ecosystems that formally fall under protected area categories often provide the livelihood base for local communities, in particular the rural poor (CBD, 2008). As a consequence, additional funding is required to compensate the opportunity costs of local people (Ferraro, 2001; Karousakis and Brooke, 2010; TEEB, 2010).

One possibility to bridge the financing gap of protected areas is the increase of private sector investment. So far, funding from the private sector is extremely modest (Emerton et al., 2006). Current studies emphasize the difficulties companies have in estimating the monetary and conservation benefits of protected areas in developing countries and the financial risks following thereof (Credit Suisse et al., 2014; WEF, 2013). One solution to resolve the concerns from private companies is expected to be the verification and third party certification of the social and environmental impacts of protected areas (Bayon, 2004; Karousakis and Brooke, 2010; Kate et al., 2004). However, international markets for land-based certificates are in the very beginning of conceptualization and need further research (Carius, 2012; Parker et al., 2009; Vorhies, 2013). It is for this reason that we explore an international market for protected area certificates (PACs) and analyze its potential to create 'win-win' solutions for private investors in industrialized economies as well as protected area developers, landholders and local communities in developing countries.

5.2 The Idea of Protected Area Certificates

Many economists see market-based instruments (MBIs) as the preferable policy option to generate financial means from the private sector for the conservation of nature (Mandel et al., 2010; Vatn et al., 2011; WWF 2009). MBIs focus on encouraging behavior through market signals rather than through command and control mechanisms based on legal requirements and obligations (Stavins, 2001). They neither define environmental targets nor do they specify any conservation measures. In fact, corporate environmental activities are influenced by an administered price, like product charges, non-compliance fees, tax incentives and subsidies, or an administered market, such as tradable pollution permits and payments for ecosystem services (Karousakis and Brooke, 2010; Pearce and Barbier, 2000).

The idea behind payments for ecosystem services (PES) is that users of ecosystem services pay landholders for the benefits they obtain through particular land management practices (Karousakis and Brooke, 2010; Wunder, 2005). Based on the

beneficiary-pays principle, PES transform external values of ecosystem services into payments for the conservation of ecosystems (Engel et al., 2008). In general, PES are defined as "a voluntary, conditional agreement between at least one 'seller' and one 'buyer' over a well-defined environmental service - or a land use presumed to produce that service" (Wunder, 2007). Conditionality is crucial for PES. In theory, payments shall only be made if conservation activities lead to the desired outcome, which is often very difficult to conceptualize and monitor. Most PES schemes are thus premised on input-based payments for sustainable land management practices rather than on output-based payments for certain services (Carius, 2012; Engel et al., 2008).

There are many design options for the implementation of PES. For instance, PES can refer to single or multiple ecosystem services, to payments in cash or in kind as well as to single local projects or international conservation schemes (Carius, 2012; Karousakis and Brooke, 2010). Overall, the number of PES programs is rapidly increasing. Mainly national governments consider PES as an instrument to reduce the overuse of ecosystems (Bennett, 2008; Claassen et al., 2008; Vakrou, 2010). But also more and more companies pay for the provision of ecosystem services (IIED, 2007; Mwangi, 2008; Perrot-Maître, 2006; Stanton et al., 2010). On an international level, however, private sector investment in PES schemes is still limited (Karousakis and Brooke, 2010). International PES have the advantage that they enable a distribution of costs between countries when it comes to the conservation of ecosystems with global importance. Yet, companies have difficulties assessing the monetary and conservation benefits of PES projects. The lack of standardization makes it almost impossible for them to evaluate social and ecological impacts of international PES, especially in developing countries. From an investor's perspective, thus only a few salable projects exist (Credit Suisse et al., 2014; WEF, 2013).

One system that may increase private sector investment on a global scale is considered to be the verification and independent third party certification of protected areas. Especially with regard to protected areas under community-based natural resource management (CBNRM) programs or areas managed in accordance with

IUCN categories V (protected landscape / seascape) and VI (protected area with sustainable use of natural resources), it is discussed how certification can improve the effectiveness of projects (Dudley, 2003; Sperling and de Kock, 2010). The first international markets for certified conservation projects, though, are still in their infancy (Carius, 2012; Parker et al., 2009; Vorhies, 2013). In order to support the development of land-based certificates and evaluate their potential to receive financial means from the private sector, we explore an international market place for PACs.

The PAC market is assumed to be an international institution that regulates the conservation of ecosystems and coordinates the exchange of financial means between investors and project developers. Conceptually, PACs are issued for geographical areas that are certified as protected pursuant to specific standards for both social and ecological best practices. In contrast to carbon markets that solely supply offsets for greenhouse gas emissions, land-based certificates offer an integrated approach for ecosystems and their variety of benefits. Investors can choose which protected area they want to support. Companies, for example, get the possibility to pay for projects focusing on ecosystem benefits that are important for the success of their business. However, it needs to be considered that no property rights are granted through PAC investment; hence that PACs cannot be used as a means to get access to land and other resources.

5.3 Methodological Approach

The study is based on empirical data collected during two surveys in Germany and Tanzania that were directed at the demand side and the supply side of PACs. On the demand side, a total of 39 interviews were conducted with representatives from German companies in the period from August 2012 to January 2013. At this time, 31 per cent of the interview partners were managing directors and 49 per cent were employed as environmental or sustainability representatives; with 63 per cent of all respondents having the power to decide on environmental investment. In the overall sample of companies, small ($<$ 49 employees), medium sized (50–2499 employees)

as well as large enterprises (> 2500 employees) are equally represented. According to the preferences of the experts, the interviews were either conducted face-to-face or via telephone. The interviews followed a semi-structured format. On the one hand standardized questions were used to produce quantitative data. On the other hand, non-standardized questions allowed the authors to account for different levels of expertise and discuss certain matters in more detail. At the beginning of every interview, experts were asked to answer all questions from their company's point of view. The average length of the interviews was two hours. Parts of the data have already been analyzed in Meißner and Grote (2014) and Meißner and Winter (2014) using a triangulation approach of quantitative and qualitative methods.

On the supply side, 26 interviews were conducted in Tanzania with experts in national state agencies, NGOs, private companies and research institutes in Dar es Salaam, Arusha, Morogoro, Moshi and Zanzibar Town from August to September 2011. The selected interviewees belong to the current key decision-makers and experts with regard to protected areas, and would potentially become major stakeholders for PAC supply in Tanzania. Each expert interview took about two hours. At the time of the interviews, 33 per cent of the experts worked for research projects and university institutes, 28 per cent for national state agencies, 22 per cent for NGOs and 17 per cent for private companies. The experts are highly qualified in terms of formal education. 11 per cent hold a bachelor's degree, 50 per cent a master's degree, 22 per cent a PhD degree, and 17 per cent hold a position as professor. They were predominantly educated oversees. More than half of them received their last higher education degree in Europe, one third in Tanzania, and one tenth in the USA.

5.4 The Demand Side: German Companies as Potential PAC Buyers

In total, 54 per cent of the interviewees stated that their companies would not support the management of protected areas, 38 per cent would buy PACs, and 8 per cent were undecided about PAC investment. We assume that investment decisions are to a large extent dependent on the market framework, the type of provided ecosystem benefits and the location of protected areas. In the following sections, we thus summarize the requirements from potential PAC buyers regarding these three factors. As we want to examine the demand for PACs supplied in Tanzania, we further discuss general challenges that companies see in the certification of protected areas in Africa.

5.4.1 Market Framework

The market framework is supposed to play an important role for private sector investment. In order to quantify results, experts were asked to evaluate ten different criteria for the PAC investment of their company on a seven-point Likert scale from '1: not important' to '7: extremely important'. Table 5.1 displays the mean values and standard deviations as well as the top box results of the different variables. Looking at the top box results that describe the proportion of respondents who rated a particular variable with values from five to seven, the transparency of the certification scheme is evaluated to be the most important condition for PAC investment. Companies want to be informed about social and ecological standards as well as about the certification process from the first validation of a protected area until the final issuance of PACs. Second most important is the traceability of PACs. This means that certificates should be assigned to the protected area they are derived from. Other significant conditions for PAC investment are: the credibility of certification bodies and project developers; the installation of a supervisory body that is responsible for the registration of projects, the issuance of certificates and the accreditation of certification bodies; frequent monitoring of protected area management and conservation outcome; the possibility to choose the geographical

origin of protected areas; and the additionality of conservation projects that guarantees that only those protected areas are certified whose ecosystems would otherwise deteriorate. Conditions that are only important for a minority of companies are the existence of a PAC trading system and the expectation of positive price developments for acquired certificates.

Variable	Explanation	Mean	S.D.	Top-box % (Score 5-7)
Transparency	Transparent certification scheme	6.66	0.63	97.4
Traceability	Certificates can be assigned to protected areas and ecosystem benefits	6.53	1.37	94.7
Certification body	Credible and trustworthy certification body	6.53	1.01	94.7
Project developer	Credible and trustworthy project developer	6.53	1.20	92.1
Supervisory body	Installation of a supervisory body	6.43	1.14	91.9
Monitoring	Frequent monitoring of protected area management and conservation outcome	6.08	1.32	89.2
Origin	Possibility to choose the geographical origin of the protected area	5.27	1.94	75.7
Additionality	Improvement of the conservation status of ecosystems compared to the baseline scenario	5.39	1.77	72.7
Trade	Development of a PAC trading system	3.43	2.21	32.4
Price	Expectation of positive price developments for PACs	2.97	1.94	24.3

Table 5.1: Required PAC market framework (N=38)

Answering the question, who should be responsible for the development and management of protected areas (N=38; multiple answers were possible), experts mainly named private companies (29%). One of the advantages private companies have compared to other project developers is seen to be the proximity to customers; giving them the possibility to quickly respond to any customer need. In addition, private companies could be contracted according to the required expertise of conservation projects. In contrast, NGOs and authorities would often lack the technical knowledge of conservation management when a variety of ecosystem benefits is concerned. Local NGOs from PAC supply countries (26%) as well as NGOs from Germany (24%), though, are expected to be the most transparent about their conservation practices. Experts also emphasize the expertise of local NGOs that can be crucial in persuading local people of the importance of protected areas. Experts

that prefer NGOs from Germany do so because they are anticipated to have the best reputation in the German public. Some experts (13%) also proposed collaboration between local and German NGOs to bring together their advantages and improve project management.

Furthermore, there is broad consensus about the necessity to develop a supervisory body that is responsible for the registration of projects, the final issuance of certificates as well as the accreditation of independent third party certifiers. Being asked about the preferred institution for these tasks (N=37; multiple answers were possible), experts primarily opted for the United Nations (38%). They justify their choice by two reasons: first, supervision of global schemes requires an institution with a global footprint; second, the United Nations have experience in controlling the mechanisms of the Kyoto protocol. Besides the United Nations, experts see NGOs as appropriate to supervise the international PAC market (35%). They are expected to work faster than public authorities and more transparent than private companies. Authorities from Europe (30%) and Germany (22%), though, would have the advantage to be able to respond to culture specific requirements.

5.4.2 Ecosystem Benefits

Experts were further asked about the importance of specific ecosystem services as well as biodiversity conservation for their company. Once again, the answers were quantified on a seven-point Likert scale from '1: not important' to '7: extremely important'. Besides biodiversity conservation, five ecosystem services were discussed:

(1) Carbon sequestration and climate regulation
(2) Provisioning and purification of water resources
(3) Provisioning of food products
(4) Scenic beauty and recreational experiences
(5) Cultural, spiritual and historical services

Figure 5.1 shows the boxplots of stated preferences for the overall sample as well as for selected sectors. Looking at the results of the overall sample, the median is highest for carbon sequestration and climate regulation. This does not come as a

surprise as one in two companies in the sample invests in mandatory or voluntary emission offsets. The second highest median is held by the conservation of biodiversity. For instance, tourism operators evaluated biodiversity with the highest possible median of 7 as the quality of tourist experience depends strongly on the diversity of flora and fauna. In the chemical industry, companies reported that genetic resources are essential for the fabrication of many of their products; and food producers and retailers emphasized the importance of biodiversity for their supply with raw materials. The remaining ecosystem services in the cross-sectoral sample have a neutral median of 3.5 - 4.0 with strong differences between the 25th and 75th percentiles.

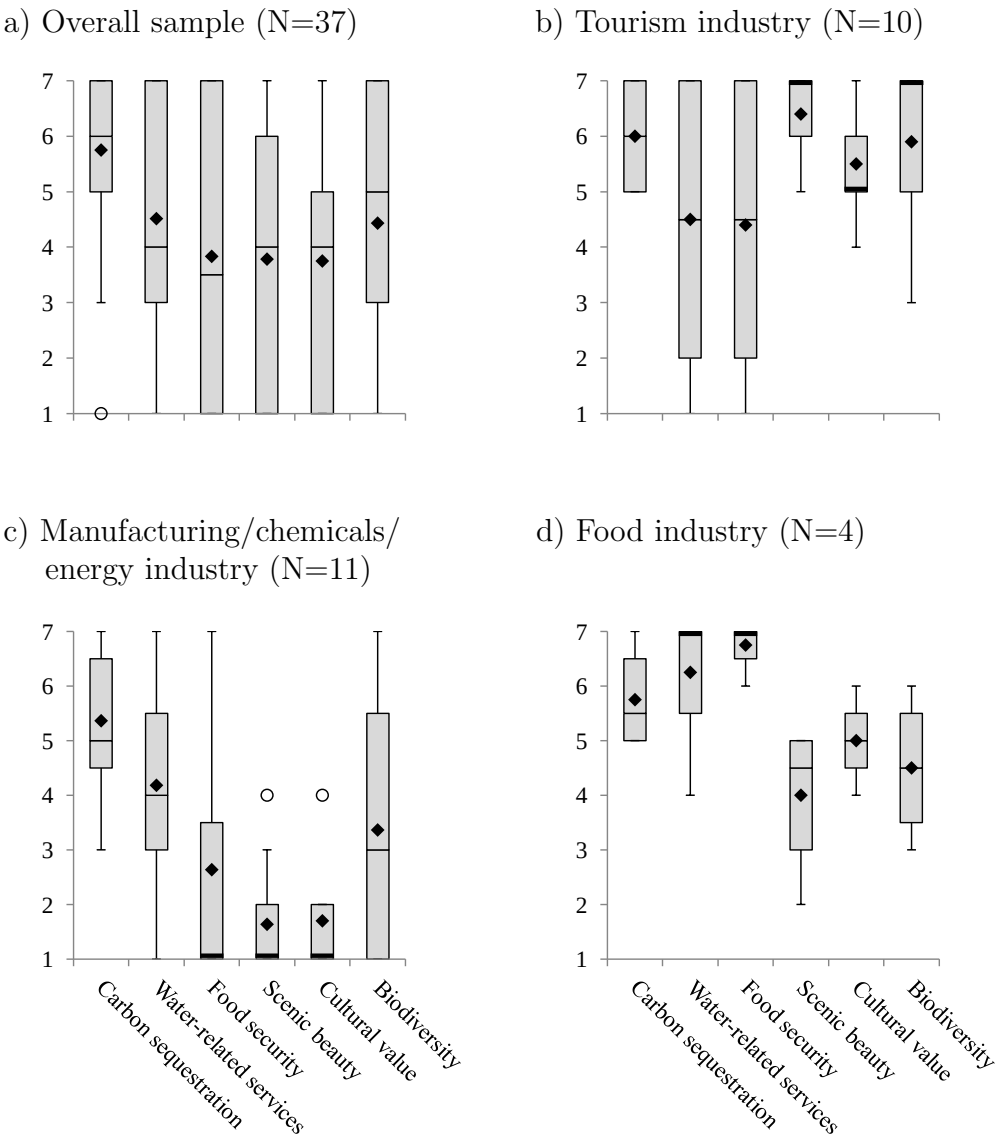
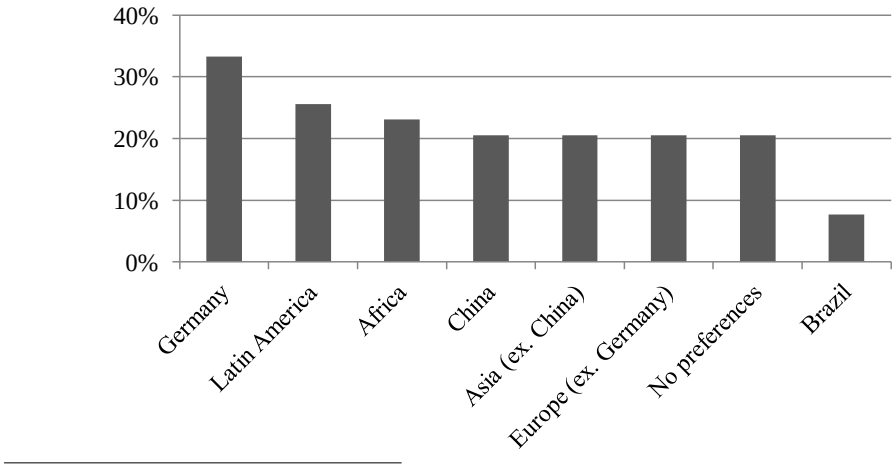


Figure 5.1: Boxplots of stated importance for ecosystem services and biodiversity

In the tourism industry, scenic beauty and recreational experiences are of similar importance for the long-term business success as the conservation of biodiversity. Furthermore, all tourist operators agree that climate and cultural issues significantly influence the tourism business. In the food industry, both provisioning of food and water-related services have the highest possible median of 7. For the majority of companies in the manufacturing, chemicals and energy industry, only carbon sequestration and climate regulation are important. When water-related services and biodiversity conservation are concerned, there is a strong discrepancy among companies. Food security, scenic beauty and cultural values, however, are identified to be of minor interest; having the smallest possible median of 1 as well as a low 75th percentile. Meißner and Winter (2014) recommend to classify PACs according to the ecosystem benefits they provide. In that way, companies could easily identify conservation projects that are relevant to their needs. As a benchmark for a potential PAC classification scheme, they propose to use the ecosystem benefit categories of the LifeWeb initiative (CBD, 2012).

5.4.3 Geographic Origin of PACs: The Case of Africa

Companies were asked about the favored location for protected areas from which they could imagine to buy PACs. Figure 5.2 displays all countries and regions that were mentioned by at least two experts during the interviews (N=39; multiple answers were possible). The majority of experts (80%) stated to choose the origin of PACs on the basis of the efficiency of protected areas. In other words, companies would invest in those areas from which they expect ecosystem benefits to be provided in the most efficient way. Second most response (33%) was to select locations that are generally rich in natural resources. Furthermore, experts' choice is caused by the objective to secure the future of their children at home (21%), to connect ecosystem conservation with poverty alleviation targets (18%), and to offset the corporate ecological impact at the location of production sites (13%). Tourism operators would select the location of PACs according to their major holiday destinations (15%).



Note: Multiple answers were possible.

Figure 5.2: Stated preferences for the geographic origin of PACs (N=39)

Almost every fourth expert stated to favor PACs from Africa. Nevertheless, interview partners are afraid that a variety of challenges might hinder or decrease the effective implementation of a PAC market in some parts of Africa. In the following, we depict the top four challenges mentioned by the experts during the interviews (N=24; multiple answers were possible). First of all, the political framework in some African countries is estimated to be economically risky for the successful realization of conservation projects, and experts are concerned that corruption might hinder the effectiveness and the efficiency of a PAC system in these countries (63%). Furthermore, experts consider an often inadequate implementation of policies and laws as a major challenge for PACs in Africa (46%). They also emphasize that the establishment and management of protected areas must be in line with livelihood needs of the people living in, around and from the protected areas (46%). From a German company's perspective these local needs are often difficult to evaluate. Yet, experts are aware that protected area projects are likely to be more effective when the local populations' livelihoods are positively affected. Last but not least, experts mentioned the lack of formal education as one major problem for the development of PACs in Africa (21%).

5.5 The Supply Side: Tanzania as Potential PAC Supplier

Tanzania boasts some of the world's richest and most diverse natural landscapes and biological resources, including several global biodiversity hotspots and areas of particularly high endemism (CBD, 2009). Millions of Tanzanians, particularly the rural poor, directly depend on ecosystem services through agriculture, forestry, pastoralism, fishery or as beneficiaries of the country's tourism industry. In the last half century, population growth coupled with agricultural expansion, rural poverty and technological progress massively increased pressure on Tanzania's ecosystems - often leading to their irrevocable destruction (Komba, 2006).

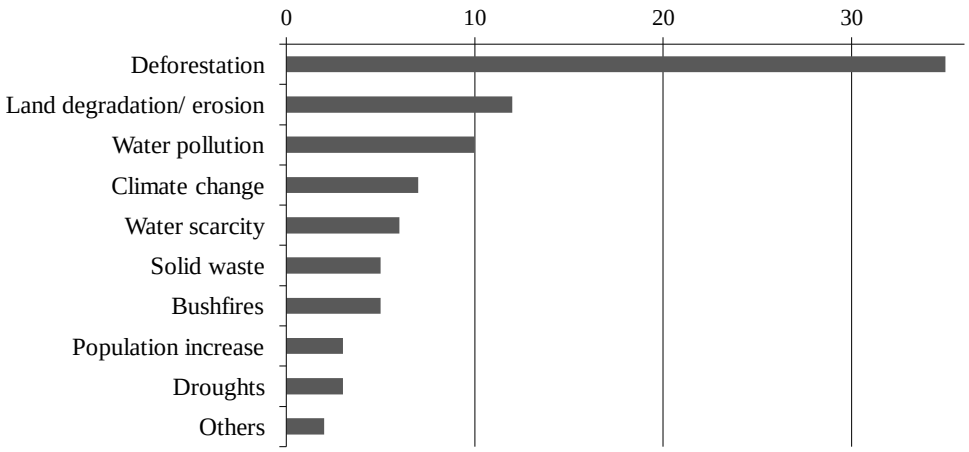
Over the past decades, a large number of concerted efforts to establish protected areas in Tanzania have been undertaken (MNRT, 2008; UNDP, 2011). Today, protected areas in Tanzania account for more than 32 per cent of the countries' total land area (Worldbank, 2014). This makes Tanzania one of the countries with the highest percentage of protected area coverage worldwide. Beyond national parks and game reserves, Tanzania hosts a full range of other types of protected areas like biosphere reserves, community-based wildlife management areas, community-based and joint forest management areas as well as community conservation areas. All these protected areas are land use planning instruments that aim to re-structure human-nature interaction (MNRT, 2008; Mwakaje et al., 2013; Songorwa, 1999).

Protected area concepts vary considerably, so does their effectiveness. According to the interviewees, some protected areas in Tanzania, most of them in the North of the country, can be characterized as positive 'show cases' that are able to effectively implement their conservation plans by attracting large numbers of (oversea) tourists. However, the majority of the Tanzanian protected areas are characterized by low effectiveness; many of them being little more than 'paper parks' (Burgess et al., 2010; Kideghesho, 2006; Setsaas et al., 2007). In recent times, these protected areas are more and more integrated in, or supplemented with international PES instruments that aim to strengthen protected area effectiveness by generating (co-)funding. Prominent international PES examples in Tanzania are the Reducing Emissions from Deforestation and Forest Degradation (REDD+) mechanism and

the certification of forest management according to the Forest Stewardship Council (FSC) standards (Cornwall et al., 2014; Mustalahti et al., 2012).

5.5.1 Awareness of Environmental Problems

We assume that the establishment, implementation and sustainability of instruments such as PACs are largely determined by the awareness of national level decision-makers and experts on the sort and magnitude of environmental problems in their country. In order to reveal the awareness of the interviewed decision-makers and experts, they were asked about the current environmental problems in Tanzania. The results in Figure 5.3 show that the interviewees consider deforestation as the by far main environmental problem in Tanzania, followed by land degradation/ erosion and water pollution.



Note: Three answers were possible. The first, second, and third are awarded three, two and one scoring points, respectively. Scores are cumulated.

Figure 5.3: Awareness of the main environmental problems in Tanzania (N=18)

The results reflect the massive deforestation problem in Tanzania (Komba, 2006). An estimated 90% of all Tanzanians use fuel wood and charcoal as a source of energy (MNRT, 2000). Forests around towns are particularly affected by charcoal making while rural forests are mainly degraded due to firewood collection, overgrazing and manmade wildfires (Burgess et al., 2010; Milledge et al., 2007).

5.5.2 Knowledge on PES and Source of Information

We suppose that the knowledge on PES and the source of information impact on the decision-making toward PACs. Accordingly, the interviewees were invited to rank their personal knowledge and information level on PES on a Likert scale from '1: very low' to '7: very high'. The findings in Table 5.2 indicate that the general self-perceived knowledge and information level on PES among Tanzanian experts is rather high, and that most of them are familiar with the current PES debate and concepts. When being asked about their sources of information on PES, the findings portrayed the following picture: trainings/ consultancies and workshops were mentioned by 81 per cent, internet sources by 63 per cent, literature by 56 per cent, and colleagues in their organization by 50 per cent. The trainings/ consultancies and workshops on PES were almost entirely provided by international state agencies and NGOs (e.g. REDD, TEEB and PES workshops provided by UNDP, CARE, DANIDA, WWF or European universities).

Knowledge and information level	No. of experts	Type
7	1	High expertise
6	2	19%
5	9	Medium expertise
4	2	69%
3	1	Low expertise
2	0	12%
1	1	

Table 5.2: Characterization of Tanzanian experts according to knowledge and information level on PES (N=16)

5.5.3 Factors Influencing the Effectiveness of Protected Area Management

Protected area concepts are based on the assumption that protected areas are - or will be - effectively implemented. Their success is directly measured upon the level of how effective they are in the achievement of their aim to provide certain ecosystem benefits. When assessing effectiveness of protected area management in

Tanzania, one has to consider the underlying factors that positively contribute to this effectiveness. Thus, the interviewees were asked what market as well as political and institutional requirements they think are most important for the effective management of protected areas in Tanzania. The participants ranked the factors on a Likert scale between '1: not important' and '7: extremely important'. Table 5.3 shows the findings with regard to the market requirements.

Market requirements	Mean	S.D.	Top-box % (Score 5-7)
Sound land use planning on national, regional and village level	6.65	0.61	100.0
Involvement of local communities	6.61	0.70	100.0
Pro-poor conservation to reduce pressure on protected areas	6.28	1.27	94.4
Clear competencies and cooperation between actors	6.11	1.53	88.9
Environmental education/ awareness raising for local communities	6.00	1.24	88.9
Frequent monitoring of protected area management	6.00	1.22	88.2
More effective organizational structures of management	5.75	1.24	87.5
More long term conservation approaches and financing	5.89	1.08	83.3
On-ground demarcation of protected area boundaries	5.72	1.78	83.3
Better payment for local staff (park wardens, ranger)	5.33	1.03	83.3
Environmental education/ awareness for management staff	5.33	1.71	72.2
Ethnic homogeneity of local communities involved	3.94	1.70	44.4

Table 5.3: Market requirements for effective protected area management in Tanzania (N=18)

Sound land use planning on national, regional and village level followed by the involvement of local communities who live and work in and around protected areas are considered the most important market requirements for effective protected area management in Tanzania. In the opinion of the interviewees, the development and the management of protected areas need to be integrated in comprehensive and long-term land use planning on national, regional and local level. Similar to other countries in sub-Saharan Africa, however, land use planning in Tanzania is constrained by many factors: unclear and overlapping responsibilities; insufficient cooperation between different stakeholders within and outside the state; inadequate data availability; unclear land tenure and land ownership; central planning and top-down approaches; lack of trained staff on all levels; lack of monitoring and evaluation; as well as weakening of planning through established sectorial interests (Kauzeni et

al., 1993; Msoffe et al., 2011). One expert estimated that "out of the 11,000 villages [in Tanzania], maybe only 5-6 per cent have a formal land use plan" (Interview No. 23, Dar es Salaam, 24/08/2011).

Furthermore, the involvement of local people is paramount for the sustainable effectiveness of protected areas. This is nowadays largely accepted in all international nature conservation paradigms (Andrade and Rhodes, 2012; Reed 2008). Although, protected area approaches have been historically exclusionary in Tanzania, recent concepts do acknowledge the need for participation of local communities (Levine, 2002). Nevertheless, the understanding of what 'participation' actually means is often unclear and ambiguous, and the gap between participation and decision-making is still wide (Niedziałkowski et al., 2012). Upon this background, participatory forest management (PFM) projects have been established since the early 1990s, and formalized by the Tanzanian National Forest Act of 2002 with the aim to give communities, groups or individuals the legal background to own, manage or co-manage forest areas. The Act allows for two different types of PFM, namely community-based forest management (CBFM) and joint forest management (JFM) (MNRT, 2008). CBFM areas enable local communities to declare and gazette forests, and then use 100 per cent of the revenues generated in these areas for their own. By comparison, JFM areas allow communities to co-manage forests together with state bodies and other forest owners and share the revenues (Blomley and Iddi, 2009). Similar developments were observed regarding the establishment of community-based wildlife areas and community conservation areas (Mwakaje et al, 2013; Songorwa, 1999). According to many studies, however, the effectiveness of these participatory approaches is still limited. Mwakaje et al. (2013), for example, show how inequitable benefit sharing negatively impacts the attitude of communities toward conservation. Based on their work on JFM, Nielsen and Treue (2012) further identify multi-layered and interconnected governance problems to restrict effectiveness by undermining the willingness of stakeholders to respect management rules.

Political and institutional requirements	Mean	S.D.	Top-box % (Score 5-7)
Reduction of corruption	6.61	0.70	100.0
Political will and support at local level	6.39	0.70	100.0
Political will and support at national level	6.56	0.86	94.4
National conservation policy	6.33	0.97	94.4
Secure and formalized land tenure rights	6.11	1.18	88.9
Delegation of power to local communities	5.59	1.23	88.2
Political will and support at regional level	5.72	1.18	83.3
More effective organizational structures of governmental bodies	5.65	1.41	82.4
Strict legal enforcement of protected area rules	5.67	1.50	77.8
Avoidance of counterproductive governmental activities	5.22	1.96	77.8

Table 5.4: Political and institutional requirements for effective protected area management in Tanzania (N=18)

Table 5.4 depicts the assessment of the importance of political and institutional requirements for effective protected area management in Tanzania. Tanzania is a country hard-hidden by corruption (Makoye, 2013) - which is "both a cause and a consequence of poor governance" (Gordon and Lawson, 2012). For the interviewees, corruption does not only hamper the economic development of the country but leads to the underperformance and ineffectiveness of environmental instruments such as protected areas. Tanzania's transformation processes toward economic liberalization since the 1980s and partial political democratization since the 1990s provided an appropriate milieu for corruption, which resembles that in Russia (Interview No. 19, Arusha, 19/08/2011). There are estimations that only 50 to 60 per cent of the money designated for development projects in Tanzania are actually effectively used while the rest erodes into corruption (Interview No. 16, Morogoro, 16/08/2011). Another important requirement named by Tanzanian experts is the political will and support for private sector investment that is currently very limited at local, national as well as regional level. Experts complained that "the national state structures are very slow" (Interview No. 6, Dar es Salaam, 12/08/2011); and that "since independence, the public sector does everything. Most decision-makers are grown up in this system, hence the private sector is not accepted" (Interview No. 16, Morogoro, 16/09/2011).

5.5.4 Desirability and Practicability of a PAC Market in Tanzania

The experts were questioned about the desirability of an international market for PACs and about the practicability to establish PACs in Tanzania. Practicability in this context is understood as the appraisement of the future practical effectiveness, reliability and potential environmental impacts. The findings show that experts in Tanzania think quite positive about the general desirability of PACs as well as its concrete practicability in Tanzania. The majority of experts (69%) answered that they consider the establishment of an international market for PACs desirable. A small minority (6%) found it not desirable, while the remaining were undecided (N=16). Similar results were achieved when asking the experts if they think it would be practicable to establish PACs in Tanzania. Two third (67%) answered with 'yes', while one fifth (20%) answered with 'no'. The remaining were undecided (N=15). Some experts who answered with 'no' or 'not sure' further explained their refusal or indecision. One interviewee explained "PACs might be theoretically desirable but practically difficult to implement with local communities in rural areas, where the most protected areas are" by referring to the low levels of expertise and formal organizational structures in rural Tanzania (Interview No. 9, Morogoro, 16/08/2011). Another interviewee stated that "already CDM has proven not to work" (Interview No. 17, Dar es Salaam, 25/08/2011). Furthermore, many interviewees are concerned that "costs of certification might be too high" to establish PACs in Tanzania (Interview No. 8-10, Morogoro, 16/08/1011).

The ecosystem benefits considered as most suitable for PACs are: the provisioning of timber, fuel wood and charcoal; scenic beauty and recreational experiences; as well as biodiversity conservation. By reflecting the massive deforestation problem in Tanzania (see Figure 5.3), this underlines the importance in the PAC conceptualization to concentrate on tangible ecosystem benefits like the provisioning of energy sources that are of major importance for local livelihoods (MNRT, 2000). The mention of scenic beauty, recreational experiences and biodiversity is also not surprising as these ecosystem benefits strongly support the tourism industry, which is one of the few sectors in Tanzania that attracts foreign investment (Cooksey and Kelsall, 2011).

5.6 Discussion and Conclusion

An international PAC market is seen as one solution to create additional funding from private companies for the establishment and management of protected areas in developing countries. The objective of the article is to analyze to what extent potential PAC buyers and suppliers see a global market place for land-based certificates as a suitable instrument to not only generate sustainable funding for protected areas but also to conserve our ecosystems. In order to do so, two studies were conducted with possible stakeholders. While the demand side of the PAC market is represented by expert interviews undertaken with German companies, interviews with Tanzanian experts shed light into the supply side of PACs. Bringing together the results of the two studies, the potential to certify protected areas in Tanzania and sell the resulting PACs to private companies in Germany is discussed. Aiming at the creation of 'win-win' solutions for private companies in industrialized economies as well as protected area developers, landholders and local communities in developing countries, we examine the interview results from three different perspectives: the required PAC market framework; the existing political and institutional situation in Tanzania; and the ecosystem benefits that are most suitable for PACs.

Market Framework

A credible standard and transparent certification scheme is one necessary condition for private companies to buy PACs. Companies will only invest in protected areas if they are certain that their investment has a positive impact on the environment and no risk of damaging their reputation exists. Thus, companies insist that the establishment and the management of protected areas are in compliance with globally accepted standards. A credible standard and transparent certification scheme would also enable sound land use planning on national, regional and village level; one of the major market requirements for effective protected area management named by Tanzanian interviewees. Experts in Germany and Tanzania also underline that frequent monitoring activities are necessary to ensure the implementation of social and ecological best practices and improve the effectiveness of protected areas with regard to the conservation outcome.

Another commonly accepted precondition for the establishment and management of protected areas is the involvement of local communities. Companies emphasize that protected areas are likely to be more effective when the livelihoods of the local population are positively affected. Hence, it is important to involve people that live and work in and around protected areas. Experts in Tanzania confirm this requirement. However, they point out that current participatory approaches still lack effectiveness. Along with the involvement of the local people, it is essential that communities and protected area staff are environmentally educated so that they understand the environmental problems in Tanzania. On this matter, companies recognize local NGOs as credible and trustworthy project developers that could act as intermediaries to the local people and raise the awareness for the importance of protected areas. In fact, the study in Tanzania exposed that local NGOs and other key decision-makers for PAC supply are not only well aware of the environmental problems in their country but also possess a rather high level of knowledge and information on PES.

Companies and Tanzanian experts disagree when the debate about 'pro-poor conservation' is concerned. Most companies would only buy PACs if the criterion of additionality is fulfilled. In other words, the conservation status of ecosystems due to the certified establishment and management of protected areas must be improved compared to the absence of PACs. Thus, certification might not be applicable for small areas owned by local communities who are often too poor to significantly damage ecosystems (Wunder, 2005). Transforming their land into protected areas might create little or even zero additionality. Actually, 80 per cent of the companies in the survey would choose PACs according to the efficiency of protected areas in terms of ecosystem conservation; while only 18 per cent stated to consider PACs as a mean to connect environmental sustainability with poverty alleviation targets. The interviewees in Tanzania, though, see pro-poor conservation as a major requirement for the effectiveness of protected areas. In their opinion, the current pressure on protected areas due to the demand of local people for resources can only be reduced if projects start to consider the synergies between ecosystem conservation and poverty alleviation.

Political and Institutional Situation in Tanzania

Both companies and national experts are concerned that corruption and an inadequate implementation of policies and laws might hinder the realization of an effective PAC system in Tanzania. Experts in Tanzania further complain about the limited political will and support that has not created a favorable investment climate since the reforms in the 1990s. With the exception of the tourism industry - that contributes to the conservation of ecosystems in some protected areas - foreign investments in Tanzania are rather low (Cooksey and Kelsall, 2011).

The situation is aggravated by the fact that PES projects are very complex and long-term while "there is almost no ability or capacity within national [state] organizations to manage, monitor or implement even basic projects" (Interview 19, Arusha, 19/08/2011). At the time of the survey, there was for example only one Tanzanian certification agency. Other certification agencies that could potentially certify PACs in Tanzania are international companies with branch offices in South Africa or Kenya. Another major institutional problem is the handling of land tenure rights that are in many cases neither secure nor officially formalized (USAID, 2011). Without addressing these political and institutional limitations, there is little chance for an effective market place selling PACs from Tanzania.

Ecosystem Benefits

In Tanzania, the interviewees consider deforestation as the by far main environmental problem. Especially the local people depend on sustainable forests as they use fuel wood and charcoal as energy source. It therefore comes as no surprise that the majority of Tanzanian experts evaluate the provision of timber, fuel wood and charcoal as very suitable for PACs. In view of the tourism industry in Tanzania, scenic beauty and recreational experiences are also considered important benefits. From a pure supplier's perspective, re- or afforestation projects in today's or future tourist areas would thus be the most suitable projects to generate PACs in Tanzania.

From a company's perspective, those PACs are of major interest that have a positive impact on their business. Companies threatened by the depletion of ecosys-

tems would invest in PACs whose targeted ecosystem benefits promise to mitigate ecological risks. Companies that strive to legitimize their business in society would rather choose PACs in a manner that allows them to offset their impact on nature. And companies that attempt to increase their sales or prices through the supply of PAC labeled products would primarily go by their customers' preferences. In short, the sector of a company determines its preferred location for protected areas as well as its favored ecosystem benefits. Re- or afforestation projects in Tanzania's tourist areas could be of interest for international tourist operators offering journeys to Tanzania. For them the depletion of ecosystems at their holiday destination constitutes a major business risk. Investment in PACs would be one possibility to secure the scenic beauty of the landscape and improve recreational experiences. Another industry interested in PACs originating from re- or afforestation projects might be the paper and pulp industry that could offset their deforestation activities and use PACs as a mean to legitimize their business. As protected forest areas are also important for biodiversity conservation and carbon sequestration, further industries with a focus on these ecosystem benefits (e.g. chemicals industry) might also be interested in PACs from re- or afforestation projects in Tanzania.

Considering the market requirements of the demand and supply side as well as the political and institutional conditions in Tanzania, it becomes apparent that the potential to create a 'win-win' solution for companies as well as protected area developers, landholders and local communities depends on two major challenges. First, the demand and supply side disagree about pro-poor conservation. While potential investors prefer protected areas that are efficient in terms of ecosystem conservation, Tanzanian experts consider the inclusion of poverty alleviation targets as a necessary precondition for the general effectiveness of protected area management. This controversy is mirrored in the 'pro-poor conservation' discourse in literature (Adams et al., 2004; Kaimowitz and Sheil, 2007; Roe and Elliott, 2006; Sachs and Reid, 2006; Wunder, 2008). While PES instruments are not necessarily designed as pro-poor (Engel et al., 2008), they can in fact have a positive impact on poverty alleviation (Milder et al., 2010; Pagiola et al., 2005). However, this often comes at the cost of environmental efficiency (Wunder and Börner, 2013). In our view, a PAC market

can only be successful if a sufficient demand for certified protected areas exists. As a consequence, we recommend that the majority of protected area projects have a core focus on environmental efficiency rather than on poverty reduction. This must not come at the cost of socio-economic best practices for protected area management. Whenever possible, environmental targets need to be complemented with poverty reduction goals.

Second, the underlying political and institutional conditions in supplying countries play a crucial role in the successful development and effective implementation of an international PAC market. Many potential supply countries are in a transition phase from state-based to market-based economies; yet, most forms of PES are still in their infancy. Until now, the investment climate is often constrained by bureaucracy, mismanagement and corruption. Only if high level decision-makers in supply countries' governments recognize PACs as a policy instrument that contributes to the sustainable use of resources and the improvement of livelihoods, PACs can become an attractive investment opportunity for the private sector.

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