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THESIS

A Comparison of the Management Models of Protected Areas between China and the Southern African Region

(English Titles)

中国和非洲南部地区保护区管理模型的比较

(Chinese Titles)

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Apply for degree level **Master Degree**

Discipline, specialty **Science of Nature Reserve**

Research Direction **Construction and Management of Nature Reserve**

Paper Submission Date **2010/04**

Oral Defense Date **2010/06**

Degree Dranted Date ——————

Replies commission chairman:
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A Comparison of the Management Models of Protected Areas between China and the African South Region

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ABSTRACT

A Comparison of the Management Models of Protected Areas between China and the African South Region allows reading and evaluating the similarities and differences in the use of management model as a management tool for protected areas in China and South African Region. Specifically, some positive and negative features of the management approaches for the two regions.

Secondary data was collected from various related literature such as policy documents, students' dissertations/thesis, scientific articles and magazines. Based on the method above, the study found out that China's first nature reserve was the Dingus Mountain Nature Reserve in Zhaoqing, Guangdong province established in 1956. By the end of 2005, about 2,349 nature reserves of various kinds were set up throughout the country, covering a total area of 149.95 million ha and accounting for 15 percent of the total land territory. The study further found that Southern Africa has approximately 4,390 protected areas out of 11487920 total land areas and Eastern Africa has approximately 1838144 protected areas, which is equivalent to 15.0% of the total land areas. South Africa in this region had its first declared natural park in 1926 after Paul Kruger (a war hero) had alerted the authorities of the extinguishing threat of some animal species of region.

Previous to this study it verified the designation of protected areas as increasing at a faster rate than ever before, comparatively much faster now in China than South Africa regions. Nevertheless, many of these areas are currently facing their greatest ever challenge (threats to their very existence) as their value to humankind increases. For that reason, it therefore behooves any success oriented model to combine different parameters as participatory biodiversity monitoring and environmental education in such a way that it responds to the local needs. Moreover, the study found that in order for a management system to erect positive results, it has to provide the exploitation-conservation balance of resources, activities, intensive participation of residents and local politicians in the management as well as in cooperate the following five elements found by the IUCN: a) representativeness, b) comprehensiveness and balance, c) adequacy, d) coherence and complementarily and e) consistency, cost effectiveness, efficiency and equity.

Last but not least, the paper further found that in China all the protected areas are state owned whilst in South Africa regions there are some protected areas that are privately owned. Also that the models or typology of governance applied are successful for the fact that they both combine co-management or collaborative management, community-conserved areas and private protected areas that are subject to greater success and can help design planning and management than those who use

exclusively government management.

Key words: Protected areas, sustainability, China, South African region, management model.

中文摘要

管理模式是管理保护区的一种工具。本文以中国和非洲南部地区保护区管理模式进行对比作为研究对象，分析其中的异同点，特别是两个地区管理特点的积极和消极方面。研究结果表明：

（1）从各类相关文献中收集了二手数据资料，例如政策文件、学位论文、科学文章和期刊杂志，资料综合表明：1956 年，中国第一个自然保护区在广东省肇庆市鼎湖山建立。截至 2005 年底，中国自然保护区数量已达 2349 个，总面积 14995.90万公顷，约占中国陆地面积的 15%。而数据显示，在非洲南部，面积 11487920 平方千米的陆地上大约有 4390 个保护区；在东非，保护区的面积大约有 1838144 平方千米，占东非陆地面积约 15.0%。在 Paul Kruger（一位战斗英雄）向当局发出部分动物物种灭绝的警告后，1926 年南非建立了第一个自然公园。

（2）在这项研究之前，要求建立保护区的指示越来越多，相比之下，中国和非洲南部地区要少得多。尽管这样，随着人口的增加，这些保护区目前还面临着严峻的挑战（威胁到他们的生存）。有鉴于此，把成功的东方模式和不同的参数相结合，作为参与性的生物多样性监管和环境教育，这样才能对地方的需求负责。此外，研究发现，为了让管理模式能产生良性影响，就必须找到一个资源、科研、群众和地方政府积极参与的开发与保护的平衡点。群众和地方政府积极参与管理并且遵守世界保护联盟提出的五项原则：典型性、广泛性和平衡性、充足性、连贯性和互补性、一致性有效性和公平性。

（3）中国所有的保护区都是国有的，而在南非，有些自然保护区归私人所有。除此之外，政府所采用的模式或者类型，也就是把共同经营和共同管理结合起来，实践证明这是成功的。国有的保护区和私人所有的保护区都取得了巨大的成功，并且与单纯的国有管理相比更有利于保护计划拟定和管理。

关键词： 自然保护区；可持续；中国；非洲南部地区；管理模式

CONTENTS

1 INTRODUCTION

There are over 120,000 such protected areas, covering around 12% of the Earth's land surface (BIP 2009). These areas represent one of the most significant human resource use allocations on the planet. The importance of protected areas is reflected in their widely accepted role as an indicator for global targets and environmental assessments.

China has a vast area of protected area totaling hundreds, which are of various forms and categorized into three levels (national, provincial and city/county). These demonstrate an intense desire by the Chinese government to implement natural resource management policies, as well as long term sustainable use of model of management, with local communities at the various levels stated above.

However, it is not easy for a country with one quarter of the world population, experiencing a continuous need of natural resources products from protected areas to completely balance environmental management and sustainable exploitation of the resources. Therefore, processes like industrialization, that affect both the environment and the resources in these protected areas, remain a challenge.

The southern region of Africa, particularly countries like South Africa, part of Namibia, Botswana, Zimbabwe and Mozambique, have relatively small protected areas compared to China, but on comparing the usage capacity of management models that are directly/indirectly linked on to the type of governance, organizational model of community and the principles defined by the IUCN the region of southern Africa represents successful accumulative experiences. It is important to note that among them, Southern Africa has the most positive development records when it comes to effective natural resource management. This is probably due to the long-term European colonizers policy, who contributed greatly in encouraging sustainable natural resource exploitation to ensure environmental sustainability, as well as development of educational and informative environmental programs.

Moreover, the ideas of natural resource conservation and protection of biodiversity were not lost. For example, investment were made in tourism, industrialization was balanced, which ultimately helped in minimizing poverty by offering alternative survival mechanisms to local communities.

However, both China and the Southern regions of Africa has different management models for their protected areas and no studies done regarding this aspect. Therefore, the significance of this study cannot be overemphasized as it is aimed to compare the Management Models of Protected Areas between China and the African South Region. By evaluating the similarities and differences in the use of management model as a management tool for protected areas in China and South African Region will be able to erect valuable recommendations towards improving the professional practice of

environmental impact assessment (EIA) in various areas of activities and governance for protected areas.

2 NATURAL CONSERVATION INTRODUCTION AND RESEARCH TECHNIQUE

2.1 Definition of Protected Areas

The term protected areas consist of various aspects both terrestrial and marine. They received this name because of their similar environmental and cultural values that vary by level of protection and by the enabling laws of each country or rules of international organization.

This leads to the consideration of definitions by various science branches. For instance, economists refers to protected areas as land or raw materials that are often characterized by amount of existing biodiversity in various ecosystems including both biotic and a biotic, but undisturbed by mankind.

But business defines protected areas as protected potential forms of wealth supplied by nature, such as coal, oil, wood, water power, and arable land. Also the geographers have given its collaboration to affirm that nature reserve are any property of the physical environment, such as minerals, or natural vegetation, which humans can use to satisfy their needs. Therefore, for a geographer protected areas means protected nature reserve. Moreover, the International Union for Conservation of Nature (IUCN, 1994) defines it as "An area of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means". In spite of all various definitions, in this paper the former definition will be used.

It is internationally recognized that protected areas transcend different environments and vary considerably from country to country, depending on national needs and priorities, and on differences in legislative, institutional and financial support from the highest mountains to the deepest sea, across forests, deserts, lakes and even national boundaries (territories).

The notion of "Protected Areas" called "Nature Reserves" in China is not very distant of the concepts used for African regions, where all the protected areas belong to WDPA and are administered by IUCN's Program on Protected Areas. This was confirmed with the Law of Nature Reserve entered by the legislation process of the 10th National People's Congress (NPC) in 2003 (NPC, 2003).

Therefore, this definition has some points in common "A clearly defined geographical space, recognised, 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, N (Editor) 2008). However, the first key point of this definition is that the primary objective of the protected area is the conservation of biological diversity. The second key point is that the protection is "effective". This

generally means that the area is protected by an Act of the Parliament, in case of public land, or by a covenant or conservation agreement, in case of privately owned for many cases in Africa mainly the south region, or indigenous land.

2.2 Protected areas in the wider development context

The designation of PA is increasing at a faster rate than ever before. Nevertheless, many of these areas are currently facing their greatest ever challenge (threats to their very existence) as their value to humankind increases. These special areas can only achieve their conservation objectives within a context of political support and local acceptability. However, this has to be based on a collaborative approach with local communities and other stakeholders at the very core of management. It furthermore, requires the invention of a model that supports the new paradigm in having conservation objectives as their key focus for the inter-relationship between nature and people.

It has verified that in many regions, mainly in China, the protected areas system is not directly connected with the government plans for overall land use and development programs at national, provincial and county levels in the past. But now China's new Scientific Development Perspective calls for a higher level of recognition for PAs (NHRAPC, 2009). And the responsibility was given to SEPA (State Environmental Policy Act) through the planned Ecological Function Conservation Areas (EFCAs) whose aim was to provide coherent guidance to land use across certain critical ecological zones with important biodiversity and ecological processes.

Southern Africa had five colonisers within the region and the Britain had a dominant presence over time leaving many legacies including the form in which protected areas are managed whether under state, private or communal ownership, has changed dramatically (Abernethy, 2000). Whereas in the past a professional approach to species protection may have been appropriate now it is necessary to manage simultaneously for biodiversity, social and economic sustainability and within and across socio-political and geographical boundaries. To bring about a fresh approach to the job, a new generation of managers is required.

2.3 Quantity/Type of Nature reserve, location and eco-region delineation

The study on the eco-regional system is an important foundation for developing physical geography and is combined with different units based on regional differentiation of the earth surface nature. Scientifically, it provides a regional framework for studying regional response to global change, establishing environment monitoring systems, applying remote sensing and GIS, planning network of ecological stations and analyzing experimental data and observational information. In fact, the regional differentiation results from the interaction between zonal and azonal factors. SoE China (2006) approves the

scope and functional zoning of the following 3 national nature reserve in China: The Yalu River Mouth Wetland of Dangong in Liaoning Province, Yancheng Wetland Rare Birds Nature Reserve in Jiangsu Province and Yading nature Reserve in Sichuan Province. Additionally, graphic (2-1, 2-2, and 2-3) and 2-4 below show the Nature Reserves and type of Nature Reserves in China (not include Hong Kong, Taiwan and Macau) while simultaneously demonstrating the great variety that exists in this country.

However, China's first nature reserve was the Dingus Mountain Nature Reserve in Zhaoqing, Guangdong province established in 1956. By the end of 2005, about 2,349 nature reserves of various kinds were set up throughout the country, covering a total area of 149.95 million ha, and accounting for 15 percent of the total land territory (SEPA, 2003). Protected through these nature reserves are 88 percent of China's land eco-system types; 87 percent of its wildlife populations; 65 percent of its higher plant communities; nearly 20 percent of its natural forests; 50 percent of its marshland and wetland; the main habitats of more than 300 precious and endangered wild animal species; and major distribution areas for over 130 precious tree varieties (ICUN, 2008).

Fig.2-1 Amount, by province of Nature Reserves in China, 2006. *Note*: NL refers to national level; PL refers to provincial level; CiL refers to city level and CL refers to country level.

9

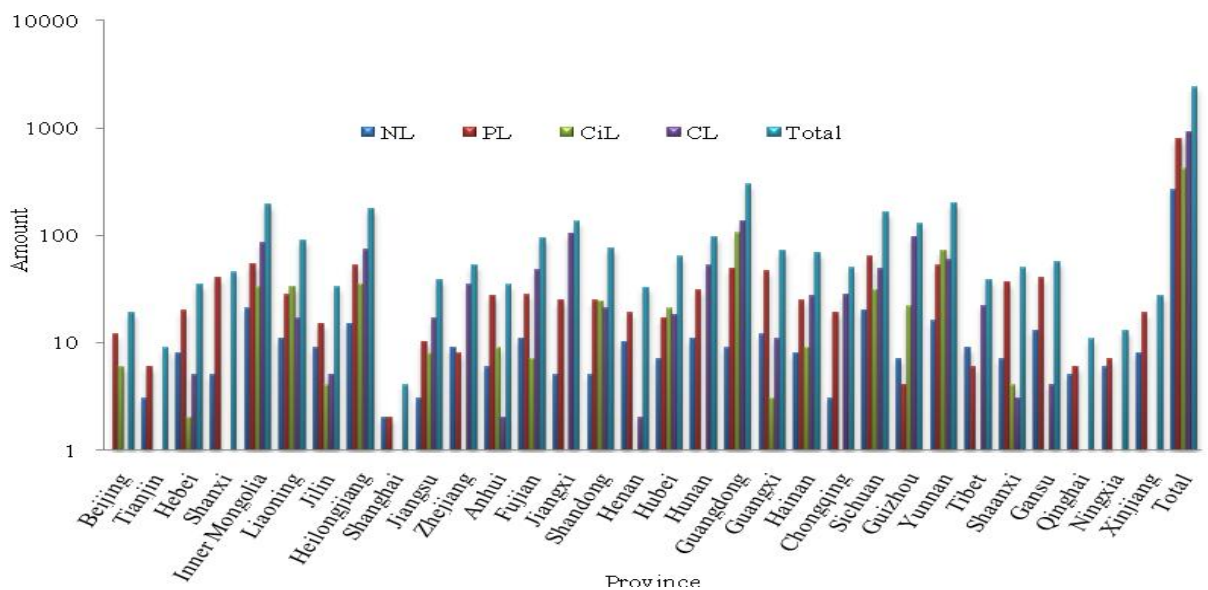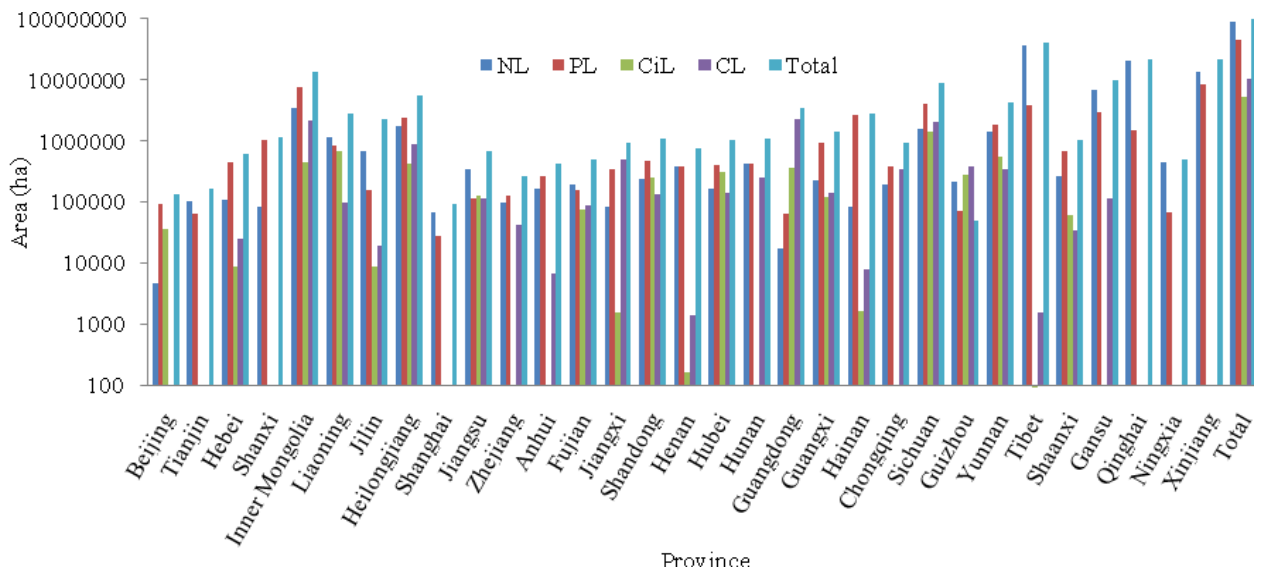Fig.2-2 Area (ha) by province of Nature Reserves in China, 2006. Note: NL refers to national level; PL refers to provincial level; CiL refers to city level and CL refers to country level.
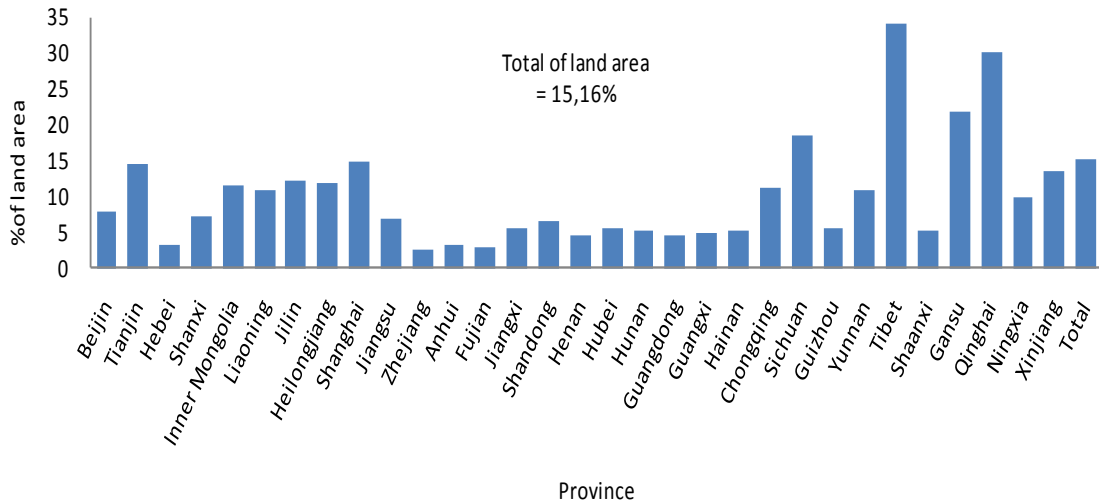
Fig.2-3 Land area (%) by province of Nature Reserves in China, 2006. Note: NL refers to national level; PL refers to provincial level; CiL refers to city level and CL refers to country level.
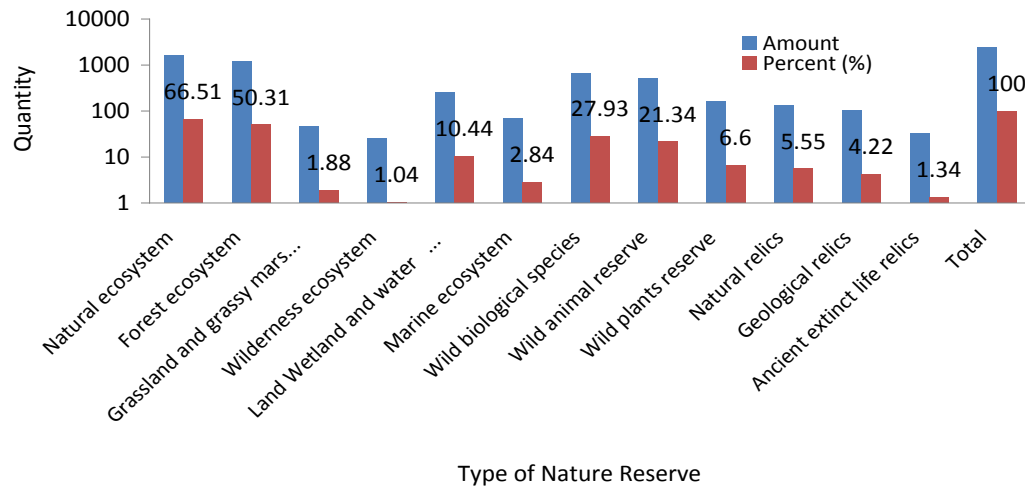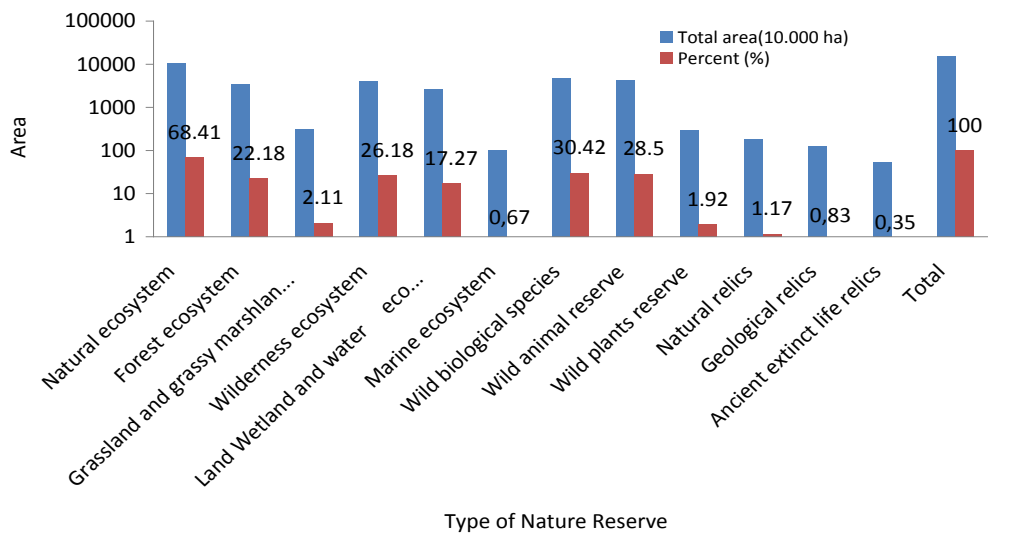
Fig.2-4 Type of amount and area (ha) of Nature Reserves of China in 2006

Since the 1970s the upsurge of international interest in nature reserves has had a major influence on China. China's Changbai Mountains, Dinghu Mountains, Shennongjia, Wuyi Mountains, Xilin Gol Prairie, Fanjing Mountain and Wolong nature reserves have all been declared international biosphere reserves by UNESCO's Man and the Biosphere programme. For example, Sanjiangyuan Nature Reserve established in August 2000 located in the central area of the Qinghai-Tibet Plateau, at the source of the Yangtze, Yellow and Lancang rivers (http://www.cbcf.org.cn/english/zrbhq/index.htm). Moreover, according to SEPA (2003), China's Guangdong province has 256 nature reserves and thus considered as the biggest province with most nature reserves covering a combined area of 3.3 million ha. The map below (fig.2-5) shows some Chinese provinces having biospheres reserves presented in red colour. Wolong and Jiuzhaigou in Sichuan, Changbaishan in Jilin,

Dinghushan in Guangdong and Baishuijiang in Gansu are among the 27 nature reserves that have been designated by UNESCO as "World Biosphere Reserves," where China is included with a total of 27 regions (Word Biosphere reserve UNESCO, 2006).

Fig.2-5 Location of Nature Reserve and Biosphere Reserve in China
Source: WWW.Planetware.com ©IGDA Baedeker, reedited and adapted
(Note: This chart is a network downloaded version, only the distribution of protected areas for the label, is a schematic and do not represent the actual land area of China)

However, this schematic mapping that does not imply any opinion concerning the legal status of any country or territory concerning the delimitation of its frontiers or boundaries was opted for in attempt to approximate location of the biosphere reserve.

Southern Africa has approximately 4,390 protected areas out of 11487920 total land areas and Eastern Africa has approximately 1838144 protected areas, which is equivalent to 15.0% of the total land areas (WDCPA, 2009). South Africa had its first declared natural park in 1926 after Paul Kruger (a war hero) had alerted the authorities of the extinguishing

threat that the animals of the region were suffering from excessive hunting. Adding to this, in 1931 South Africa added two more parks, Addo Elephant and Bontebok National Parks and in 1937 it progressively added the Mountain Zebra National Park. On a current note, amongst the six Southern Africa regions South Africa leads the ranking in both the level of nature reserves, parks and biosphere reserves (DEAT, 2007).

Analyzing graphic 2-6 above, it clearly verifies that the region of southern Africa presents a diversified mosaic situation in terms of protected areas, reserves, parks and others do far much numerically exceed the reduced diversity of the Chinese regions. But this region becomes more illustrative due to the raised diversification of existing categories and performance of these regions, as much as the management level, private administration and community integration. Moreover, this region possesses special characteristics and biological diversities, at world-wide level, that are specifically found there in only as well as exclusive activities only practiced there. These exclusive activities are mostly seen in Safari areas and protected areas such as private ranches, private reserves and World Heritage Sites as game drives, snorkeling, birding, diving and trekking (SouthAfricaSafari.info 2001–2005).
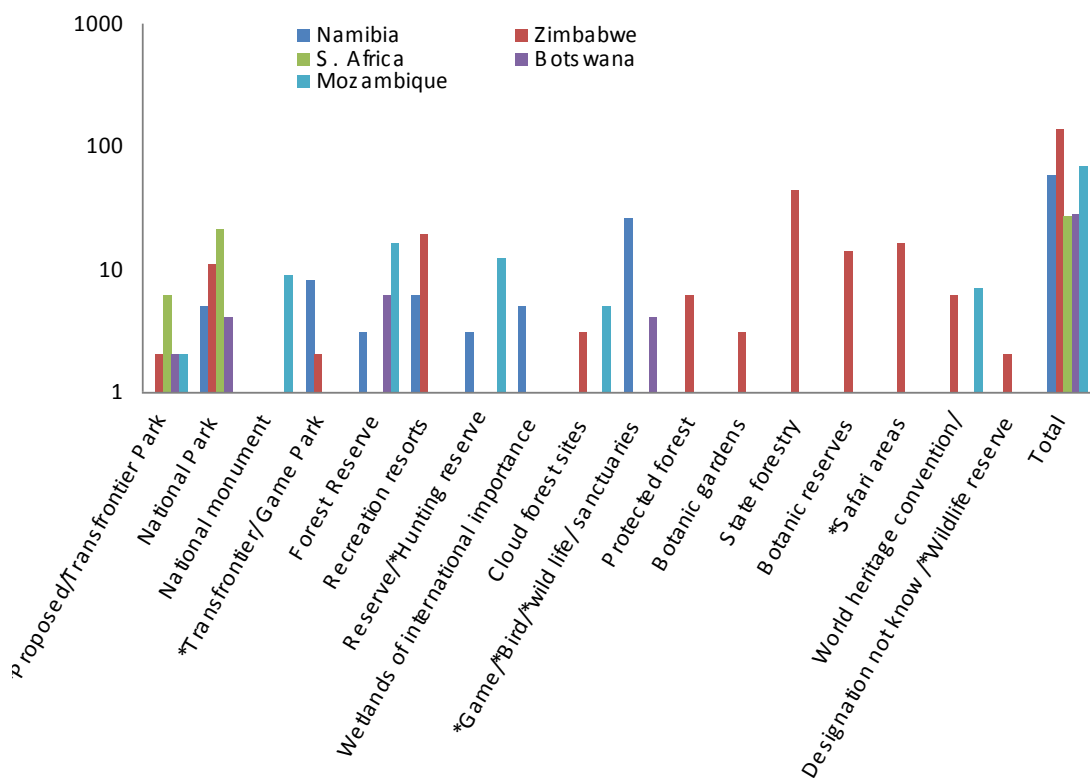

Fig.2-6 Parks, Reserves and other Protected Areas in Southern Africa (terrestrial).2009

Moreover this region is well known for its many reserves, some of which are pioneers in Africa. Examples of such includes: the wild Chectahand and wildlife center in Pretoria, the Sondela nature reserve (Witsand Kalahari Northern Cape), entrance Gate (karu Kareb nature reserve), the Mkhambati nature reserve (Hluleka) eastern Cape, Tygerbeng natural reserve (Kapstadt) western Cape and Ongoyi, all in South Africa; Mabalingwe nature reserve share block in Limpopo, Mozambique; Goche Ganas nature reserve in Avis/Khomas, Namibia; and the Stanley & Livingstone at Victoria Falls (Zambezi), Zimbabwe (IUCN, 2003; DEAT, 2007).

Fig.2-7 below attempts to give a more deepened vision on the dimension of these countries and distribution of some natural reserve areas.

Fig.2-7 Localization of Natural Reserve in Southern Africa
Source: SEPA February 2005. Reedited and adapted.

However, without denying the largeness and richness in natural resources and biodiversity of this region, South Africa and countries sharing borders with South Africa

and Zimbabwe contributes much to these in making a proper South of Africa. For instance, Zimbabwe, in the west and south shares borders with the South African provinces Mpumalanga and Limpopo and in the east with Mozambique (see map beside figure 2-8 reedited and adapted)[2] . In terms of biodiversity, the wildlife reserve situated in the Transvaal (National Park Kruger- South Africa) on a land scale of about 20000 km^2 demonstrates its contribution to the richness of the region in biodiversity. Transvaal has abundant species of over a hundred mammals, five hundred bird species, a hundred reptile species, 40 fish species and 30 amphibians and with over three hundred tree species (UNESCO, 2002).

Fig.2-8 Map of Limpopo

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[2] UNESCO (last updated 2002) reedited and adapted

3 COMPARISON OF THE MANAGEMENT MODELS OF PROTECTED AREAS

3.1 Management Models

Protected areas are not all managed in the same way, and IUCN recognizes six different categories of management based on objectives (see Table 3-1 below). These range from protected areas where human visitation is strictly controlled, to protected landscapes and seascapes which contain cultural landscapes and are often settled human communities. Both for a vast country like China with a variety of geographical features, climate and vegetation types ranging from plains, hilly land and plateau to the highest peak in the world. Moreover, Mount Everest ranges from tropical rain forests, subtropical, temperate, frigid temperate and high altitude frigid forests to deserts and from oceans, freshwater lakes to highland freshwater and saltwater wetlands. Notwithstanding, Southern Africa region also has a variety of climatic conditions ranging from tropical humid to cold weather.

Tab. 3-1 IUCN categories

Category	Function
la	Protected area managed mainly for science or wilderness protection
lb	Protected area managed mainly for wilderness protection
II	Protected area managed mainly for ecosystem protection and recreation
III	Protected area managed mainly for conservation of specific natural features
IV	Protected area managed mainly for conservation through management intervention
V	Protected area managed mainly for landscape/seascape conservation or recreation
VI	Protected area managed mainly for the sustainable use of natural resources

Source：IUCN (1994)

In addition, it is recognized that a healthy protected area system usually needs a variety of model management structures and respecting management cycle in protected area (Bakken et al., 1992; Hockings et al., 2006). For instance, relying entirely on government owned and ran protected areas is risky if the government priorities shifts from conservation. There have been instances where community conserved areas survived well than government-controlled areas in times of civil strife; in Zimbabwe, for example, where community game management areas survived better than the state-run national parks.

However, any model to succeed it is necessary to combine different parameters as participatory biodiversity monitoring and environmental education in such a way that it responds to the local needs. Furthermore, in order to make the management of our protected areas more effective, it has to be based on a collaborative approach with local communities and other stakeholders at the very core of management. And often it is necessary to have an adaptive management condition that is a critical principle for natural

resource management. Adaptive management provides a framework that allows the resource manager to deal with complex ecological systems for which there are constant changes hence making available information incomplete. The strength of adaptive management is that it establishes an experimental or scientific approach to resource management. But this requires some performances such as: protected area design, legal establishment, boundary demarcation, resource inventory /assessment and objective-setting. According to the Vth World Parks Congress (2003) in protected areas there are some management principles such as: legitimacy/voice; subsidiary; fairness (do no harm!); direction; performance and accountability. Combining the performance and principles of protected areas it can be believed to give a perfect and unique model capable of giving deferential management situations for both different parts of China and Southern Africa regions.

3.2 Typology of Governance of Protected Areas

"Governance of protected areas" is a relatively new concept in the conservation field and it first rose to prominence at the Durban Congress. Governance is about power, relationships, responsibility and accountability. Some define it as "the interactions among structures, processes and traditions that determine how power is exercised, how decisions are taken on issues of public concern, and how citizens or other stakeholders have their say". Thus, it is the combination of explicit and implicit policies, practices and institutions that affect public life.

In a protected area context, governance covers a broad range of issues-from policy to practice, from behavior to meaning and from investments to impacts. It is crucially related to the achievement of protected area objectives (management effectiveness), determination of the sharing of relevant costs and benefits (management equity), which is a key to preventing or solving social conflicts, and its effects on the generation and sustenance of public support (Feyerabend et al., 2004).

"Governance", in this context, relates to IUCN's understanding of a protected area or the understanding developed by the CBD Conference of Parties. A basic distinction between governance types can be made on the basis of who holds management authority and can be held accountable according to legal, customary or responsibility otherwise legitimate rights. Feyerabend et al, (2004) found that government managed protected areas (A), co-managed protected areas (B), private protected areas (C) and community conserved areas (D) as the four main governed types identified and discussed during the Durban Congress (see Table 3-2).

Tab.3-2 IUCN governance types for protected areas

Type	Description
（A）Government management	Protected area managed by national or local government, occasionally through an officially appointed independent body
（B）Co-management or collaborative management	Involving local communities in management (active consultation, consensus-seeking, negotiating, sharing responsibility and transferring management responsibility to communities or NGOs)
（C）Community-conserved areas	Natural and/or modified ecosystems voluntarily conserved by indigenous, mobile and local communities. Some may be official protected areas, others compatible management systems suitable for buffer zones and corridors
（D）Private protected areas	Protected areas managed by private individuals, companies or trusts

Source: World Congress on Protected Areas of 2003 and adapted by IUCN

Most people are familiar with type A governance, in which a government body (such as a Ministry or Park Agency reporting directly to the government) holds the authority, responsibility and accountability for managing the protected area. The governance has also to determine its conservation objectives in subjection to the management regime, but the governance often owns the protected area's land, water and other related resources.

In China and some regions of South Asia, government institutions are considered as the most important natural resources conservation institutions. The government may or may not have a legal obligation to inform or consult other identified stakeholders prior to setting up protected areas and making or enforcing management decisions (Feyerabend et al., 2004). Here the NGO functions only as catalysts. Contrariwise, in Southern Africa the situation is different in sense that the NGO works in cooperation with the governance and can bring in their views. Therefore, the NGO in Southern Africa regions has a voice and power.

Type B governance is also becoming increasingly common, responding to the variety of interlocked entitlements recognized by democratic societies. Complex processes and institutional mechanisms are generally employed to share management authority and responsibility among plurality of actors - from national to sub-national (including local) government authorities, from representatives of indigenous, mobile and local communities to user associations, private entrepreneurs and land owners.

However, Canada and Australia are the leaders in co-management of protected areas in the Developed World. On the other hand, many developing countries in Asia (Nepal), Africa (Zambia, Zimbabwe), and Central America (Honduras, Nicaragua) have adopted various forms of co-management of protected areas (Neely, 1995; Stevens, 1997;

Beltran, 2000). In present time we have South Africa and Mozambique as countries that have demonstrated an authentic domination of the system, where the ethnics or indigenous groups are the biggest actors in the management (Xalapa, 1999; Adger et al., 2006). In relation to China, it had implemented various attempts in the past but without great visible results. Nonetheless, it has on current note implemented another dynamic strategy which involves bigger extinguished remote areas in indigenous communities to whom it gives some autonomy and specific benefits (GEF/CNRMP, 2002).

Type C governance has a relatively long history, as kings and aristocracies often preserved for themselves certain areas of land or the privilege to hunt wildlife. Such private reserves had important secondary conservation benefits. Today, private ownership is still an enormously important force in conservation. Private reserves include areas under individual and cooperative ownership. Cooperative ownership can either be profit oriented or non-profit oriented (John, 1999).

For example in the Northern Province of South Africa there has been a recent trend to restock privately owned savanna areas with indigenous herbivores. These private game farms contribute significantly to conservation. It is estimated that there is more private land than state land under conservation management in the Northern Province. About 9% of the Waterberg Mountains are conserved in these private conservation areas and game parks (OECD/FAO, 2005). Additionally, some statisticians found that Southern Africa region contributes 1 to 7% of total land area and are marginally more extensive than legally designated protected areas managed by government agencies (OECD/FAO, 2005). In relation to China, there are no privately protected areas, if there are then they are so suppressed such that they cannot appear in the international statistics report submitted to the government's total domain.

Type D governance involves governance by indigenous, mobile and local communities. This may be the oldest form of protected area governance and it is still widespread. Throughout the world and over thousands of years, human communities have shaped their lifestyles and livelihood strategies to respond to the opportunities and challenges presented by their surrounding land and natural resources.

In Community Conserved Areas, authority and responsibility rests on the communities through various forms of ethnic governance or locally agreed organizations and rules. These forms and rules are very diverse and can be extremely complex. For instance, land and some other resources may be collectively owned and managed, while some other resources maybe individually owned and managed or managed on a clan-basis (Feyerabend et al., 2004).

However, the western provinces differ from those of the coastal and eastern due to different natural conditions and diversities in ethnic and cultural livelihoods, which are extensively based on collective resource property and lower adaptability to economic

changes. It is safe to predict that SW China has the most conductive natural conditions for community conserved areas. For example, provinces of Sichuan, Yunnan, Shaanxi, Inner Mongolia and Tibet autonomous region.

The policy shift in Southern Africa towards local community benefit and control of natural resources had its beginning with rights over wildlife being transferred to white freehold farmers in Zimbabwe and Namibia in the 1970s (Jones and Murphree, 2001).

In Botswana more than 120 villages are involved in community management of wildlife and other natural resources and income to local communities (Rozemeijer, 2002). In Zimbabwe more than 100 000 communal area households benefit from wildlife income, hunting and tourism on freehold and communal land worth US$ 1 billion (Murphree and Metcalfe, 1997). In Namibia there are currently 15 community institutions (also called conservancies), managing another four million hectares of land with more than 200 000 wild animals including endangered black rhino, endemic species such as Hartmann's mountain zebra and large parts of Namibia's elephant population (de Jager, 1996).

However, the functional community or natural resource governance institutions can be established and empowered to represent their constituencies in securing fair equity. This fair equity should be from profits made from multi-land use, multi-stakeholder participation and sustainable use of the conserved biodiversity that it contributes to the alleviation of rural poverty and assets tourism businesses.

3.3 Rule of good behavior of adaptive management

Adaptive management focuses on learning and adapting protected areas sustainability measures through partnerships of managers, scientists and other stakeholders who have the know-how on sustainable use of protected areas.

Adaptive management is a critical principle for natural resource management. It provides a framework that allows the resource manager to deal with complex ecological systems for which there are constant changes hence making available information incomplete.
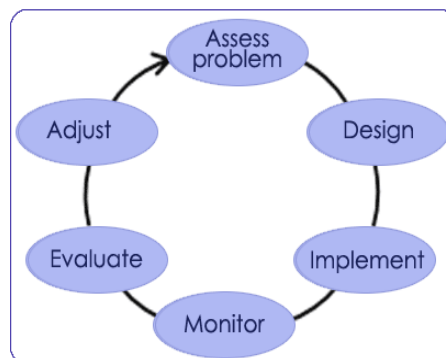

Fig.3-1 Diagram the adaptive management process (source: U.S Department of Interior, 2007)

This diagram is often used to characterize adaptive management process. The arrow

indicates the direction of the adaptive management process cycle. The natural resource management teams assess the ecological problems in the area under consideration. Secondly, they will design a nature protective plan (nature conservancy). Thirdly, they will implement the plan or put the plan to work. For instance, if the plan designed was to fence the area, this will entail purchasing fencing equipments and investing in labour. Fourthly, they will monitor the progression of the plan i.e. ensuring that the labourers are fencing the area as required. Fifthly, they will evaluate if the plan is in line with the objectives or not. Also to see if there are adjustments needed. Finally, adjustments are incorporated and the cycle continues.

However, the multiple iterations of this loop may occur within each iteration of the overall cycle, accelerating learning about ecological process within the more comprehensive cycle that includes learning about the adaptive process itself (through periodic problem reassessment, design and implementation).

3.4 Usual Management

To start with, sustainability is hard to implement, though simple to spell out. Some initiatives have successfully reduced human pressure on distinct ecosystems, but on the whole, humanity has not lived up to the challenge of reducing or stabilizing human pressure. It is daunting for the "golden billion" that is blessed with unprecedented personal wealth and material abundance since the current situation provides them with comfortable lives. Nevertheless, their privileges might be called in question if the world adopts a sustainable path (Wackernagel, 2000).

Too few of the institutions serving the golden billion have taken an active stand to give sustainability teeth and to make progress toward measuring sustainability. On the contrary, they have a propensity to keep the debate fuzzy, which conveniently diffuses the pressure to address (Wackernagel and Moran, 2004).

Protected areas are by no means uniform entities they have a wide range of management aims and are governed by many different stakeholders. At one extreme a few sites are so important and so fragile that no-one is allowed inside, whereas other protected areas encompass traditional, inhabited landscapes and seascapes where human actions have shaped cultural landscapes with high biodiversity. Some sites are owned and managed by governments (in China for example) whilst others by private individuals, companies, communities and faith groups (concrete of Southern Africa for example). This leads to the realization that there is a far wider variety of governance than had been hitherto assumed.

3.4.1 Financing Mechanisms

Inadequate funding of protected areas has negative implications on a number of management inputs (infrastructure, personnel and equipment); management processes (law

enforcement, ecological and socioeconomic research) and on monitoring management outputs against the protected areas' objectives and management inputs. This has led to situations where protected areas have personnel capacities that are below threshold to fulfill their mandates (e.g., law enforcement), leading to the decline in populations of some wildlife species (Cumming, 2004).

A variety of innovative financing mechanisms are being used to secure sustainable funding for protected areas. Several of them have been reviewed and summarized by the WCPA in their best practical guidelines for managers using a combination of mechanisms and sources to ensure that funding is long term and sustainable (Phillips, 2006). The guidelines include a number of methods available to the managers of the protected areas and agencies for securing financing at three levels:

(1) Local (e.g. user fees, sponsorships, donations);

(2) National (e.g. taxes and charges, endowment funds, incentives);

(3) International (bilateral and multilateral donors and lending agencies).

Since the early 1990s, funding for environmental protection in China has increased significantly. China has augmented its expenditures for treatment of waste water as well as gas and solid waste from 4.5 billion Yuan in 1990 to 9.9 billion in 1995 (ISSR, 2006). During the 9th Five-Year Plan (1996-2000), the state appropriated 360 billion Yuan (US$ 45 billion) primarily for pollution control and prevention, excluding investment on ecological construction, which accounted for less than one percent of the GDP (gross domestic product) during that period. Still, this is nearly twice as much as the total expenditures for environmental control programs in the 6th, 7th and 8th Five-Year Plans (1986-2000) combined. Under the current Five-Year Plan (2006-10), investment on environmental protection could reach $700 billion Yuan (US$ 88 billion). With cooperation with some other central government departments, SEPA (State Environmental Policy Act) launched "Environmental Protection Campaign" early in January 2007, 82 projects with value of RMB112.3 billion (approx. Euro11.23 billion) were called down (Finpro, 2008).

However, the 5th World Parks Congress held in Durban, South Africa in September 2003 concluded the following: Government officials, protected area managers, conservation NGOs, technical consultants and donor agencies regard these as the five target audiences most critical to putting innovative conservation finance mechanisms in place. The conclusion had a special focus on the protected area managers and recommending the use of trust funds for a more efficient investment. These trust funds can take one or more of the following three forms: endowment funds, sinking funds and revolving funds. Endowment funds are the most common type of conservation trust funds (Norris, 2000). The capital (also called the "principal") of an endowment fund is usually invested in some combination of commercial bank deposits, government treasury bonds and corporate stocks and bonds. For example, South Africa's Table Mountain Fund was financed with approximately US$7 million by endowment funds, in March 2000 (Barry,

2004; www.worldwildlife.org/conservationfinance).

In the same logic of funding, the Mozambique's Ministry of Tourism received technical and financial assistance from WWF, AfD and KfW so as to assess the type of financing mechanisms that would help improve the financial sustainability of Mozambique's national system for PA.

Southern Africa belongs to the SADC region which has been very active in terms of Innovative Financing Mechanisms (IFMs) with the objective to assist SADC member states to add value to the environment (including biodiversity) for socio-economic development in Southern Africa using "new money" generated there from (FATF-VIII, 1997).

In addition, another very illustrative example goes for the Western Cape Nature Conservation Board (in SA) that administers 70 reserves and annually receives about R50 million (US$6,100,000) directly from the government and R50 million through working for water programmes (UNEP WCMC, 2004). In 2002-3 its Nature Reserves and related services received R56, 517, 000 (US$7,700,000). The 2000/3 budget for Cape Peninsula National Park was R40 million (US$ 5,800,000) from grants, entry fees and concessions. In 2001 Baviaanskloof received one million dollars (UNEP WCMC, 2004).

3.4.2 Establishment

Many protected areas of the world encroach and are found within and overlap with lands, territories and resources of indigenous and traditional peoples. In many cases the establishment of these protected areas has affected the rights, interests and livelihoods of indigenous peoples and subsequently resulted in persistent conflicts (WPC, 2003). But leaning on positive presumptions, the establishment and management of PA is the second element of the ecological management approach. PAs are not by themselves the solution to protecting world's biodiversity but they rather be complemented by sound stewardships across the entire landscape.

China has made great progress in establishing protected areas, including nature reserves, scenic landscape and historical sites, non-hunting areas and forest parks. Protected areas now cover over 15 percent of the country, most of this in the sparsely-populated west (CCIED, 2004). However, there has been no comprehensive evaluation of their actual or possible effectiveness in conserving China's biodiversity. Preliminary analysis reveals significant gaps in the coverage of species and habitats, and major problems within the existing system. But some regions have obtained satisfactory results. Example of that is the first-phase construction of the Sanjiangyuan Natural Reserve in west China that had been successfully completed. The initial project covered 500 hectares of forestation, both for the establishment of affiliated irrigation programs as well as four natural reserve stations (CBD, 2004).

Southern African communities in the twentieth century lost land and natural

resource rights as a result of colonialism, the establishment of protected areas and the promulgation of statutes that controlled commercial access to natural resources (e.g. wildlife and forests). Countries with European settlement communities were radically deprived of land e.g. South Africa, Zimbabwe and Namibia (West and Brechin, 1991). However, even with this incident of colonialism the establishment of protected areas in Southern Africa was perceived in conservation circles as a success story, as much in the past as recently (Murombedzi, 2000).

The title of this recent transboundary protected area (TBPA) initiatives in southern Africa has been dynamic. However, the idea of transboundary collaboration based on clear objectives and a continuum of end states rather than a fixed end of transboundary parks seems valid and worthy of continued exploration (Simon, 2003). The first case of the Great Limpopo Transfrontier Park is one where the approach has been initiated at a high political level and been driven from the top primarily by the economic, political and conservation objectives (Simon, 2003). The next two, from the Zambezi (Lower and Upper) region, are examples of more bottom-up approaches that have encouraged initial technical and community collaboration rather than high-level "buy in" (Metcalfe, 2003).

However, the southern African region establishment is such that in April 2008, partners from the University of KwaZulu-Natal, Copperbelt University in Zambia, University of Namibia, University of Montana and US Forest Service explored the opportunity of forming a consortium to facilitate exchange and capacity building among students and land managers in protected area management (The University of Montana, 2009).

3.4.3 Staff

Normally, the PA staff within the World Heritage sites work for provincial, prefectural and local organizations and government departments responsible for utility construction and maintenance, production, tourism and natural resource management. The global mean staffing of protected areas is 27 staff per 1,000 km^2. The global distribution of staffing is much more even than for budgets. Overall, the developing countries have a staffing ratio of 27.6 per 1,000 km^2, slightly greater than the 26.9 reported for the developed regions. The developing country regions reported 56% of global staff and the developed countries 44% (James et al., 1999).

The PA staff data are presented on the basis of number of staff per 1000 square kilometers protected. Where possible, field staff, administrative staff and other staff are identified separately. In many cases, however, data allows the presentation of only an aggregate staffing level.

The regional distribution of PA staff levels illustrates that several developing countries have higher than global mean staffing. These regions include South Asia, Southeast Asia and Africa (Eastern/Southern). The table above shows that in 1996 South

Africa registered the highest staff (4, 454 staffs), followed by Hong Kong with 1,326 staffs and the least being Taiwan with only 668 staffs. Therefore, the 1996 data basically shows that more South Africans are engaged in the PA management aspect. Nonetheless, the table reveals the shortage of recent and reliable data as the data were not collected in the same year or period, making it difficult to pass a fair comparison. Otherwise, as far as the above data and protected areas are concerned, Botswana has the biggest PA (100,250), followed by Namibia (112,159) and the least being Hong Kong (417). On the contrary, though not shown in the below table, the Three Parallel Rivers of Yunnan province in China (Asia) also has a higher total staffs (approximately 3,659 staffs) engaged in the PA management aspect (Mark, 2008).

Tab.3-3 Protected area staffing data (protected areas in square kilometers) for Southern Africa and part of China (Taiwan and Hong Kong)

Country	Agency	Year	Protected area	Total Staff
Hong Kong	Agric. and Fisheries Dept C.	1996	417	1,326
Taiwan	Dept of National Parks	1996	3,222	668
Botswana	Dept Wildlife & National Parks	1992	100,250	581
Namibia	Min. Environment and Tourism	1994	112,159	562
South Africa	South Africa National Parks	1996	34,244	4,454
Zimbabwe	Dept Nat Parks Wildlife	1997	30,158	2,438

Source: WCMC – World Conservation Press 1999

Moreover, China, on national wide has more than 2,500 environmental protection administration departments with a total staff of 88,000 engaged in environmental administration, monitoring, inspection and control, statistics collection, scientific research, publicity and education. At present, the total number of various types of environmental protection workers employed by the various departments and enterprises exceeds 200,000 (http//www.china.org.cn). Similarly, UNEP and WCMC (2005), reports that South Africa Cape floral has about 207 total staffs that are engaged in various environmental management, environmental awareness and information, marketing, communication and general administration. In Kwazulu-Natal, Nature Conservation Board has a total of 604 staffs both permanent and part-time employees (UNEP and WCMC, 2000).

Though there are no published statistics about the total number employed in the areas of environment and protected areas, WDPA (2009) has the ratio for these regions as $27/1000$ km^2 or $27/100000$ ha. These ratios can be used to estimate the area for the PA,

which is 69616095.6 ha or 696160.956 km^2 corresponding to 18796.345 staffs.

3.4.4 Agricultural activities

Protected areas cover only about 10 percent of the earth's total surface cover while 45 percent of the world's protected areas maintain 30 percent or more of their land in agriculture (McNeely and Scherr, 2001). Most wild plants and animals live outside protected areas, often in agriculture-dominated landscapes and about 30 percent of the global land surface is occupied by crop and managed as pasture lands (Wood et al., 2000).

Agriculture has been compromised by unsustainable practices leading to falling production per unit effort. Formal protected areas and protection zones in agricultural areas provide many services and products essential to agricultural productivity. This implies adopting a landscape perspective of planed agriculture; focusing on understanding and working with native biodiversity so as to develop and adopt measures that can encourage native biodiversity in protected areas.

However, these measures are not trying to eliminate agricultural perimeters within the protected areas that offer principles of sustainability for containment of erosion and pollution. In protected area categories where agricultural activities are allowed, there is a need to consider productive activities which provide livelihoods in an equitable and environmentally-friendly way (ICUN, 2000). In the worldwide measure, more than 99.7% of human food comes from the land (David and Anne, 2004).

China has made great efforts to establish and improve a law regime for agriculture to adapt to climatic changes. The law regime includes the Agriculture Law, Grassland Law, Fisheries Law, Law on Land Management, Regulations of Responses to Major Emergent Animal Epidemics and Regulations on Grassland Fire Prevention (Xinhua, 2008). This state has strengthened construction of agricultural infrastructure and capital construction of farmland water conservancy, enlarged irrigation areas, improved farm-land irrigation and drainage efficiency and capability. Furthermore, it promoted dry farming and water-saving technologies, making agriculture better able to deter and mitigate natural disasters and increasing overall agricultural productivity. Besides, through the "Seed Project," China is cultivating stress-resistant varieties of seeds with high yield potential, high quality and specific abilities resistant to drought, water logging, high temperature, diseases and pests (http//www.china.org.cn).

The Southern African region faces enormous food-production and food-security challenges, given its reliance on extensive rain-fed agricultural systems and poor markets for its high-value products. At the core of the crisis is the region's historic dependence on weak and unreliable domestic-agricultural sectors, while giving minimal attention to intra-regional and international agricultural trade as a means of complementing them (Mkandawire, 2003). Some of the major reasons for the poor performance of regional agricultural sectors include lack of rural input-marketing infrastructure (e.g.

agribusinesses), a persistently un-conducive pricing and marketing environment, an inability to adopt new science and technology (as a result of inaccessibility to credit and extension services), and counterproductive trade barriers (NEPAD, 2002).

Since the early 1990s, many governments have undertaken domestic-policy reforms to enhance rapid growth in the agricultural sector. They have removed barriers, but without giving serious regard to regional and international trade issues. An important goal for SADC, therefore, is to strengthen regional integration in order to improve the availability of factors of production and increase aggregate income (Takavharasha, 2003). Agriculture has long been recognized as a source of livelihood for the African poor rural households as well as the engine for economic growth. The ability of households to exchange/move surpluses from regions of comparative advantage to regions with less potential within a country or across national borders is an important ingredient to developed sustainable agriculture, and improvement of rural livelihoods and stimulating economic growth.

3.4.5 Grazing

Since grazing involves use of a renewable natural resource, it is imperative to have a good knowledge of the processes involved in maintaining the productivity eco-system of this renewable natural resource. It is important also to have a clear understanding of the impact of various human interventions as well as the expected response of the eco-system to such interventions. Decisions on the policy level and intensity of the use of the pastures should therefore be based on the scientific knowledge regarding ecological processes – its ability to recover or its resilience, cost of restoration and enhancement. It is estimated that almost 30% of the grassland biome has been permanently transformed (Fairbanks et al., 2000; Rutherford, 2006). Of this percentage, agriculture contributes 23%, plantation forestry 4%, urbanization 2% and mining 1%. A further 7% of the grassland biome has been severely degraded by erosion caused by poor land management practices (Fairbanks et al., 2000; Rutherford, 2006).

Grazing by livestock has been an important issue for the management of the national parks and protected areas. Generally, it has been observed that grazing has negative impact on the ecological stability of the grazing area, albeit at varying levels. This impact results primarily from two sources - browsing of the ground flora and erosion as a result of hoof marks (Bakker, 1998).

China has nearly 400 million hectares of grassland and 84.4% of the grassland is located in the western part of China (e.g. region of Tibet, Sichuan) and all regions that make borders with Inner Mongolia as from east to west, the provinces of Heilongjiang, Jilin, Liaoning, Hebei, Shanxi, Shaanxi, Ningxia Hui Autonomous Region, while Gansu (SoS China, 2000). With an area of about 331 million hectares, accounting for nearly 40% of the total land area of the country, ranks China as second in the world. However, the area

of grassland per capita is only 0.33 hectares, half of the world's average (0.66) hectares per capita. China has a low percentage of usable grassland, small good-quality grassland area and low grassland quality due to degradation, desertification and salinity. The salinity is quantified to 135 million/hectare and is still increasing at annual rate of 2 million/hectare. Therefore the ecological situation of grassland is very serious (SoS China, 2000). In 2003, the Chinese government reinforced grassland law in order to maintain the biological diversity in natural and man-made grasslands, protect and develop grasslands, improve their ecological environment and the situation in which grassland resources are managed (SoS China, 2000).

There is a clear evidence of changes in the structure and specific composition of grasslands in southern Africa. Today, these grasslands and savannas swarm with a variety of wildlife, yet they face unprecedented pressures. Increased demand for land is fragmenting the last remaining migratory routes for wildlife, while competition for resources is forcing people to change traditional lifestyles (Ellery and Scholes, 1995). Though significant areas of grasslands in South Africa, Tanzania, Zambia and Botswana are technically under the protection of national parks and reserves, these areas are beset by lack of staffing, dwindling resources and inadequate management. This, therefore, leaves the land and wildlife vulnerable to poachers, unregulated tourism and other threats (Hoffman, 1999).

Shaped over millions of years by volcanoes, droughts and fires, the grasslands and savannas of Africa are home to a stunning array of wildlife. For example, the blaze of colour in the Rainbow Nation botanically-rich habitat of South Africa's Cape Floristic Region, Mpumalanga and the lush Okavango Delta, wet grasslands of Zambia, the grassland and savannas for Botswana and Namibia. These vibrant landscapes are home to a wealth of animals found nowhere else on Earth. Living alongside this rich diversity of wildlife are 40 million people who rely on this region for food and water for their livelihoods (FFI, 2009).

3.5 Management systems of protected areas

Currently the management of PA largely depends on the quality and drive of its management staff and the resources available to them, however it needs some structured system that will work towards set objectives and targets. The system should be able to do the following: identify risks within each protected area and set objectives to address these risks, address conservation concerns, clearly define roles and responsibilities, determine and promote best practices, reduce liabilities, identify gaps, help ensure legal compliance and provide a framework which will allow for regular monitoring and continual improvement. The system should additionally take in account the participation of residents and local politicians in the management, obtaining profit from the resource management for people who live near or inside the protected area (Dudley, 2008). The former target is

among the most important management targets especially for large countries like China. For such countries need a system that would achieve and maintain effective management, regardless of the quality of its managers (John, 2004).

It is a general view that the management system can bring positive results, if it provides the exploitation-conservation balance of resources, intensive participation of residents and local politicians in the management. Standardizing the management systems of PA is difficult. Actually, it is not necessary because the biological, geological or cultural features of every PA are unique. For this reason, every unit must form its own management system, by committing some international, national and/or regional rules. In the concept of this study, various protected areas that have different exploitation-categories are compared to each other by their management systems. The ideal management system and its essential features are constituted by acquired data.

The overriding purpose of a system of protected areas is to increase the effectiveness of in-situ biodiversity conservation. IUCN has suggested that the long-term success of in-situ conservation requires that the global system of protected areas comprise a representative sample of each of the world's different ecosystems (Davey, 1998).

IUCN/WCPA characterizes a protected area system as having five linked elements (Davey, 1998):

（1）Representativeness, comprehensiveness and balance

Including highest quality examples of the full range of environment types within a country as well as the extent to which protected areas provide balanced sampling of the environment types they purport to represent.

（2）Adequacy

This looks at integrity, sufficiency of spatial extent and arrangement of contributing units. These are integrated with effective management to support viability of the environmental processes and/or species, populations and communities that make up the biodiversity of the country.

（3）Coherence and complementarily

Positive contribution of each protected area towards the whole set of conservation and sustainable development objectives defined for the country.

（4）Consistency

Application of management objectives, policies and classifications under comparable conditions in standard ways so that the purpose of each protected area within the system is clear to all. This is intended to maximize the chance that management uses to support the objectives.

（5）Cost effectiveness, efficiency and equity

Cost effectiveness refers to appropriate balance between costs and benefits, while equity looks at equality/equity in their distribution. Efficiency is the minimum number and

area of protected areas needed to achieve system objectives.

3.6 Analysis of the Current Management System

The Government of China has recognized the benefits provided by PAs and has legally protected over 4000 sites and put in place extensive environmental legislation (CCIED, 2004). However, despite the measures taken, the integrity of many PAs and the effectiveness of PAs in providing national, regional and local benefits are still at risk from pressures of human population growth and economic development. In addition, some essential economic development components such as road building, mining, oil exploration and extraction, pipeline construction, dams and water diversions and other large infrastructure projects have devastating effects on natural ecosystems and PAs if not planned carefully.

For example, over-harvesting (or harvesting in ways that damage the ecosystem) of wild animals, trees and other plants, and overgrazing also pose threats to PAs, as do drainage and conversion of wetlands for agriculture and aquaculture, and pollution from industries and households (http://www.cbb.int/).

Africa is the custodian for many of the crown jewels of the world's environmental assets constituting a holistic basis for the compilation of indigenous and integrated plans for the future of the continent's PAs. In particular, Southern Africa currently enjoys a promising stability. One of the recognizable achievements is the developed transboundaries in protected areas in an attempt to remove barriers and political borders from ecosystems, allowing the free migration of animals between countries and providing large, contiguous habitats for wide-ranging wildlife. Simultaneously, governments, NGOs and park administrations have begun to view these transboundary protected areas as a means to accomplish a range of goals far beyond nature conservation. These goals include stimulating economic development through tourism, resolving political divides between bordering countries and improving regional governance. But there always appear gaps regarding fragmentation and isolation of protected areas, the knowledge and skills for managing their use, alternative land-use threats, poverty and strife or barriers that prevent the overall success. Such barriers include lack of funds; insufficiency of equipments and tools; unavailability of trained manpower in trails construction and interpretation; the failure of the national government to promote eco-tourism activities and cost/maintenance needs (UNEP, 2003).

3.6.1 Policy

China's first major environmental policy, the so-called "Three Rivers, Three Lakes" policy during the 1950s, addressed flood control, hydropower construction, river channel problems, and rural and urban water supply. During the two past decades, China's "Cultural Revolution" prevented any concrete progress on environmental protection. In the mid-

1970s, concern over environmental protection resurfaced. In 1975, the State Council began issuing environmental protection laws. Half of these statutes dealt with protecting nature and combating pollution whilst the rest concerned governmental administrative tasks, enforcement procedures, the responsibilities of scientific research and propaganda agencies. By the 1980s, substantive steps had been taken to coordinate the environmental policies of national, provincial and local agencies. At the same time, the state government began to acknowledge the importance of chixu fazhan ("sustainable development") in international environmentalism. By definition, sustainable development is the development that meets the needs of the present without compromising the ability of future generations to meet their own needs (Michael, 1987).

During the 5th IUCN World Parks Congress (2003), 2.700 representatives of governments, NGOs, private sector, scientific community and indigenous groups, coming from all over the world, were expected to find answers to issues on environmental policy. Participants realized that the Congress does not recognize the importance of appropriate forms of wildlife utilization to generate revenues for conservation. Instead, overemphasis is still placed on non-sustainable external funding.

For example, despite over two decades of efforts towards involving indigenous and traditional peoples in protected area management, there are few successful examples[3]. Several international principles and guidelines on indigenous peoples' involvement in protected areas exist. Some example practiced in Nepal, Thailand, Southern Africa and China shows that the involvement of indigenous peoples is more successful where park or other nature resource planning is participatory and where political and socioeconomic reforms are underway (Elizabeth, 2002).

However, it is not conclusive but one more note that while the protection of nature is the primary concern in national parks and protected areas, it is also recognized that meeting the needs and priorities of local, often indigenous residents and Co-management agreements between indigenous peoples and protected areas authorities is vital to ensure long term survival of protected areas.

These examples happened when While Canada and Australia were the leaders in co-management of protected areas in the developed world, when many developing countries in Asia (Nepal), Africa (Zambia, Zimbabwe) and Central America (Honduras, Nicaragua) adopted various forms of co-management of protected areas (McNeely, 1994; Stevens, 1997; Beltran, 2000).

In Africa, especially the history of the southern regions has demonstrated determination and emancipation in this matter. Mainly countries like South Africa,

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[3] Environmental Management Vol. 30, No. 6, pp. 748–763

Botswana, Namibia and Mozambique where the tradition came from the early days of setting the man in the region. By way of example, there exist some very old ethnicities showing the race and knowledge level of protection and conservation. This was the case for "Tswana and San people" who spread throughout the southern region where they are to negotiate for their replacement, due to fights for biodiversity preservation (Chris, 2002; Michael, 2006).

It should be noted that southern Africa has shown an enviable performance on the level of conservation policy and protection of biodiversity benefiting from international communities and local funding to continue important environmental policies. As the tax incentives and payment for ecological service models will be investigated based on cost benefit analysis to encourage land-owners to conserve threatened lowland habitats, private land owners within the perimeters of protected areas will receive benefits - rate rebates (local tax rebates) (May and Peter, 2002).
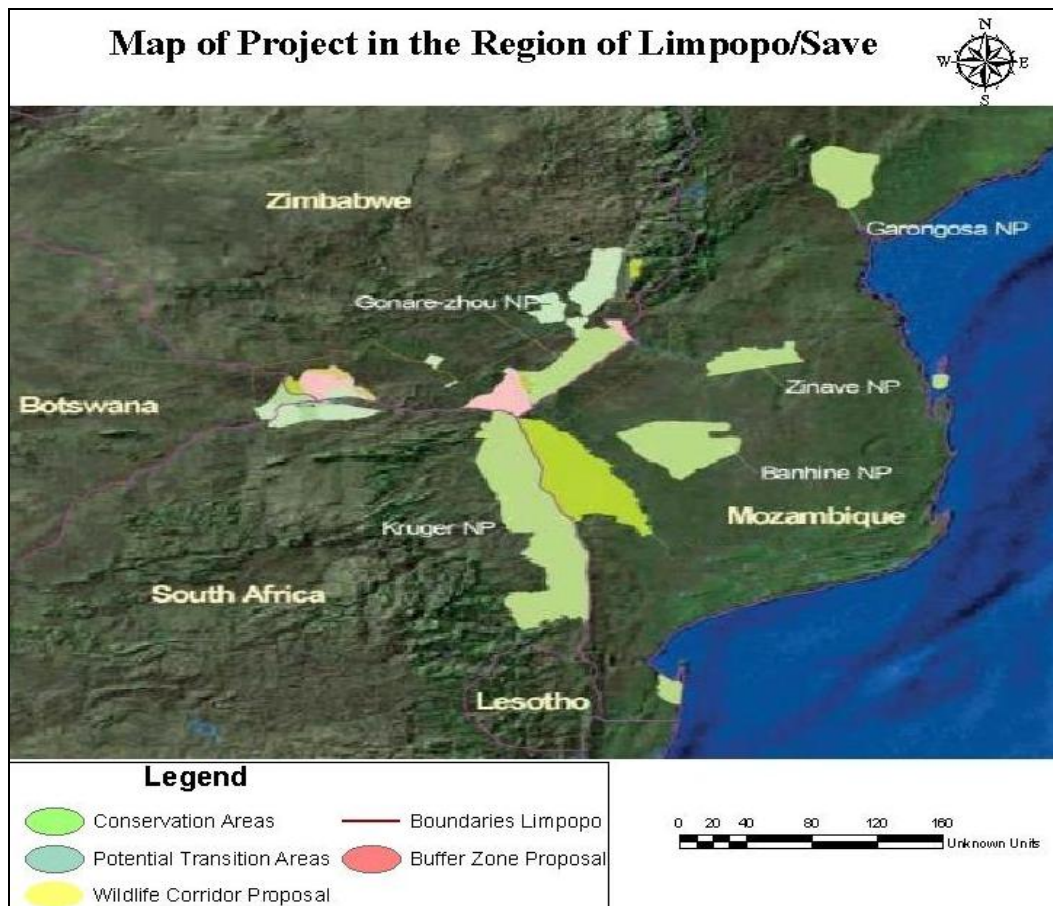

Fig.3-2 Map of the project in the region of Limpopo/Save

Source: CESVI- Network European NGO, reedited and adapted

However, this policy was not developed in isolation, but with involvement of Zimbabwe, Botswana, Mozambique and South Africa. The policy was developed with the

following objectives: (1) to improve the living standards of the people and the status of the natural resources of communal lands in the Limpopo/Save catchment basins encompassing the border of Zimbabwe with Botswana and Mozambique with South Africa (see fig.8-2 above); (2) to elaborate a long-term plan for the sustainable management of natural resources in the target areas; (3) to create environmental conservation component; and (4) to protect and restore the wildlife resources in the target areas by creating buffer zones and wildlife corridors (Wolmer, 2003; Boroto, 2002).

3.6.2 Budget

According to Jaimes (1999), the 1996 statistics shows the global mean budget for protected areas as US$893 per km², the developed countries mean as US$2,058 per km² while the developing countries mean as US$157 per km².

Priority countries for financial assistance were identified based on low budget inputs and high biological richness. For example as the international organizations raised sufficient additions between 2004/2008, the support for Zambia was reduced from US$ 7.1 billion in 2004 to US$ 1.8 billion in 2008 (World Bank, 2008).

In view of this, what verifies the world-wide level does not have stable central budget allocation. For example, PAs in China takes more than 15% of the country's total land area and plays an important role in supporting the ecosystem, a living basis for development. However, the central government has not established a separate account in its budgeting system to support the PA system (CCIED, 2004). This issue has been raised for many years but has still not been properly dealt with. In past years, the government funding to PAs has been significantly increased, for example between 1993 and 2001 the Chinese government has invested RMB 460 million (US$55,577,000) in the nominated area. Nature Conservancy with the Yunnan provincial government invested US$5 million in regional conservation in Meilixueshan, Laojunshan and the Nujiang, but most of them are one time allocation or on project basis (CWHL, 2003).

The last decade has seen the largest increase ever in China's investment in its environmental protection. A pluralistic financing system based on government support has taken initial shape after years of efforts. Increasing government input into environmental protection. During the Tenth Five-Year Plan period, 111.9 billion Yuan was earmarked from the central budget for environmental protection, of which 108.3 billion Yuan, from the treasury bonds. This money was used mainly to: (1) control the dust storm sources threatening the Beijing-Tianjin area, (2) protect natural forests, (3) turn cultivated farmland back into forests or pastures, (4) control pollution around the Yangtze River's Three Gorges Dam area and its upstream, (5) control pollution on the Huaihe, Liaohe and Haihe rivers, Taihu, Dianchi and Chaohu lakes, (6) industrialize the reuse and recycling of sewage and garbage so as to reclaim waste water (Xinhua, 2006). Since 1998, the State has focused

Treasury bond investment on environmental infrastructure construction, bringing along a large amount of social investment. Between 1996 and 2004, China's investment into environmental pollution control reached 952.27 billion Yuan, amounting to one percent of that period's GDP (Xinhua. (2006a). In 2005, for Beijing alone, the government spent a total of 17.9 billion Yuan (US$2.2 billion) on the environment. Relocation work commenced for the city's two major polluters, the Capital Iron & Steel Group and the Chemical Industry Area in the south-eastern suburbs (Green Olympics, 2006).

3.6.3 Protected areas Sectors

To start with, Natural Resources, both renewable and non-renewable, are generally known as the fundamental source of production for food, energy and manufacturing inputs also as the absorber of the disposed pollutants and wastes. Human health and well-being depends on effective and sustainable management of these natural resources. In this direction economy and society is dependent on a range of goods and services provided by the environment which are essential for human survival, health and well-being as well as economic prosperity. These relationships are particularly significant in rural areas and for the informal sector where the dependence on the natural resource base is most direct (Gerbens, 2003).

In 1997, the vision for the PA's sector was defined in this form: A prosperous and equitable society living in harmony with our natural resources. And to achieve this vision has to take into account the following guides.

(1) People's quality of life, daily living and working environments;

(2) Integration of economic development, social justice and environmental sustainability;

(3) Sustainable use of social, cultural and natural resources;

(4) Conservation and sustainable use of our biological diversity;

(5) Public participation in environmental governance[4].

The strategic importance of the sector is unquestionably linked to its role as ensuring sustainable development, through protection of the natural resource base upon which the economy of the country and the well-being of its population depends.

However, in addition to the integration of sustainable development into its mandated areas of activity, the sector also has a role to play in coordinating and encouraging government and the general society to embrace and implement sustainable development. Furthermore, there is growing interaction and interdependence between protected areas and development sectors, including, for example, tourism, energy, water

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[4] This statement is also taken from the White Paper on Environmental management Policy

resource management, fisheries, forestry and agriculture. For this, the ME and MAFF needs to work with the relevant agencies to prepare policies, guidelines and plans for the use and maintenance of PAs to be reflected in sector budgets and programs. The way a government is structured has important implications for PAs. An overriding force in the current political landscape is a commitment to decentralization and the transfer of political, fiscal and administrative powers to local authorities at commune level. Decentralization will facilitate the active participation of local communities and officials in the planning, implementation and monitoring of development. Communities located near protected areas will benefit from new structures and processes that involve them in decisions concerning the management of PAs.

3.6.4 Monitoring of protected areas

The need for ecosystem-wide monitoring has become more pressing as the goals of conservation have expanded from saving endangered species and national parks to sustaining biological diversity, ecosystem function and ecological services. Quantification of species trends and the factors governing population and ecosystem viability are vital to forecasting, planning and managing wildlife populations, and in auditing the success of alternative conservation policies and practices (Wilson, 1986).

In principle, the conservation status of the Southern African Bushveld is good. Many areas of natural habitat have been conserved in the form of provincial nature reserves, conservation areas and private game farms. Pilanesberg National Park, in the southwest of the ecoregion, is one of the most important reserves. This 553-square-kilometer (km^2) national park encompasses an isolated ring complex of volcanic hills, one of three such ring complexes in the world (William and Peter, 1995). The park conserves a large area of "mixed savannah," dominated by A. karoo, A. caffra and F. saligna. It is home to many threatened large mammals including black rhinoceros, African elephants, cheetahs and brown hyenas. In 1999, for instance, the park introduced nine African wild dogs (Lycaon pictus), which are critically endangered (Low and Rebelo, 1996).

The situation in Botswana and Zimbabwe is very different because the human population density is low and is restricted to small settlements. There are still large areas of continuous habitat remaining in these two countries. There are no protected areas in the Botswana portion of the ecoregion. In Zimbabwe, the most important protected area is Matopos National Park (425 km^2) (www.worlddillife.org). The Matobo Hills are an essential water catchment area and are known for their unique geological formations, dominated by many granite inselbergs, or kopjes, interspersed with caves. In records, it has as many as forty raptor species and over 85 mammal species, including small but well-protected populations of black and white rhinoceros (Ceratotherium simum). Finally, the region has great cultural and archaeological significance, which had been inhabited from

the Stone Age to the present (Apps, 2000 and www.worlddillife.org).

China also, on the other hand, has demonstrated an active paper on the establishment of PAs since the first Nature Reserve (NR) was established in Dinghushan in Guangdong Province in 1956 (CCIED, 2004). Since then, new PAs have been added to the national coverage, slowly until 1979 and then rapidly after the Cultural Revolution. There are now over 1 900 terrestrial NRs covering over 13% of the land area, 80 marine NRs and over 2000 other types of PAs, including forest parks (1 476), 690 scenic landscape and historical sites (SLHS) that account for a further 2% of the national territory. On summation, it shows that China has designated 15% of its land area as PA, somewhat higher than the global average (PATF/CCICED, 2004).

A few very large NRs in sparsely-populated areas of Tibet, Xinjiang and Qinghai account for about 30% of this coverage and the coverage in other provinces is significantly lower. PAs coverage in the eight westernmost provinces is around 20%, and in the rest of China the coverage is barely 5%. So the coverage is far from even over the country. The NR legislation is very restrictive with respect to human activities in all of the three management zones provided for, but many NRs are simply superimposed upon a mosaic of land uses that are often in severe conflict with the legislation (CCIED, 2004).

There are several regulations on PAs: the Nature Reserve Regulations, the Temporary Regulations for Scenic Landscape and Historical Site and Management Measures for Forest Parks. All NRs are established under the 1994 Regulations of the People's Republic of China on Nature Reserves which allow for only one management category. Nevertheless, NRs are established for a variety of purposes and at different levels of government: national, local, provincial and prefectural (Colin, Scott and John, 2008)

Current legislation has been found to be inflexible and ill-matched to the real situation of most PAs in China, so various teams are already engaged under the National People Congress Environmental Protection and Nature Resources Conservation Committee in preparation of a new law for NRs and revision of existing regulations for SLHSs (Scenic Landscape and Historical Site) (Dayuan, 2000).

3.7 Game Management in Protected Areas

Aldo (1993), one of the pioneers of wildlife management scientists, in his book titled Game Management, defined Game Management as the art of making land produce sustained annual crops of wild game for recreational use. Game keeping is the management or control of wildlife for the wellbeing of game birds which may include killing other animals which share the same niche or predators to maintain a high population of the more profitable species, such as some bird introduced into woodland or control of some animals in African savanna (Dietrich, 1992).

Management of PAs means that resources are dedicated to provide special attention to the problems of each area, which might sustain the health of the resources (Kelleher and

Kenchington, 1992). Both in Southern Africa as in China, many protected areas that are under threat and exposed to mismanagement and degradation calls for urgency to find ways of ensuring effective management.

In Southern Africa the network of protected areas is quite extensive, perhaps unequalled in the world. Of the region's seven million square kilometers of land, over one million are designated protected areas (Crane, 2006). For this, the game management has taken a different direction trying to integrate the region such as the Central Kgalagadi Game Reserve (52,800 km$^{2)}$ in Botswana, Selous Game Reserve (51,200 km^2) in Tanzania, Namib-Naukluft National Park (49,768 km^2) in Namibia, Kafue National Park (22,400 km^2) in Zambia and Niassa game reserve (42,000 km^2) in Mozambique (CEPFS, 2009).

However, as a form of giving greater dynamism and effective game management, landowners who owned farms or ranches and fed on wildlife for the past three decades, faced prohibition by law. As a matter of fact, the decline in wildlife populations and distribution forced the rulers of the region to reformulate the legislation and provide new opportunities for economic development for both farmers and governments. For example, in South Africa Game-ranches cover 16 million hectares and Namibia about 80 percent of the wildlife is on privately owned farms and ranches. In Zimbabwe, 10 percent of commercial farmers keep wildlife. Much of Botswana's eight percent of privately owned land is used for hunting and tourism. Swaziland is setting up game-ranches. The remaining countries of the region are just about to establish game-ranches too (CEPFS, 2009).

For a few decades, China has strengthened to improve and stabilize its PAs. For example in 1996, the central government issued 42 environmental standards, among which were 32 national standards and 10 sector standards, having replaced 33 old environmental standards. By the end of 1996, there were 347 national standards and 28 sector standards for environmental protection issued, totaling 375 (SoS China, 1997). On July 13, 2001 in Moscow, Beijing was awarded by the IOC the right to host the 29th Summer Olympic Games. In its bid, China pledged to stage a "green" event that will contribute to the protection of the environment. Given the will and some effort demonstrated in the area of environment, both in Beijing and in other provinces, in November 18, 2005 the BOCOG signed a memorandum of understanding with the United Nations Environment Program. The two sides agreed to effectively cooperate in the gathering and sharing of environmental information, promotion and education on environmental protection (UNEP, 2008).

3.8 Protected Wildlife (animal) Management

Wildlife management involves the application of scientific knowledge and technical skills for protection, conservation and management of wildlife and their habitat. It is an interdisciplinary subject, since it includes biological, technological, social, economical and

legal aspects. Wildlife includes all non-domesticated species of wild plants, wild animals and other organisms (Gerhard, 2004).

Management of wildlife encompasses conservation of endangered, threatened and non-threatened species and their natural habitats. It also includes implementation of certain laws and acts related to wildlife. In fact, wildlife management tools are laws implemented to protect the existing natural habitats. Successful management of wildlife totally depends on certain elements as habitat, arrangement of food, carrying capacity, social tolerance, population dynamic and death rate and their coordination. Public support and awareness is necessary to protect wildlife and their habitats. Wildlife managers, are should however use ecological knowledge in order to bring about a balance between the needs of populations and the needs of people (Ningthoujam, 2008).

However, in the Southern region of Africa an important experiment has been taking place over the past 40 years (Child, 1995). To a considerable degree, these nations have legalized and privatized the use of wildlife, encouraging hunting, tourism, and the sale of meat, hides and horns. Wildlife remains res nullius (without formal owner) or state-owned, but if certain conditions are met, southern African governments have delegated to the owners of private land the full rights to control the use of wildlife on their land. The private owners have the authority to determine the timing, place and extent of hunting, viewing or culling of wild game. Since the 1980s, under a variety of community-based, natural resource management property-rights regimes, this innovative approach have also been adapted to the management of wildlife by people living on communal lands (Kay and Nelson, 2000).

Ironically speaking, one of the economic success stories in the past two decades in Zimbabwe has been the establishment of effective private property rights to the benefit of wildlife management. As a result, wildlife populations on private lands have boomed. Despite recent lawless actions, the experiences of the past 25 years in Zimbabwe and other southern African nations in privatizing wildlife offer important policy lessons for the rest of the world. China, on the contrary, in the field of law and regulation is well served. As far back as 1956, the Standing Committee of the National People's Congress instructed the Ministry of Forestry and Chinese Academy of Sciences to give great attention to the protection and management of wild fauna and flora, set up nature reserves and felling-restricted area (Dayuan, 1998). However, considerable improvement occurred with the reform and open-door policy allowing giving a new life and vitality opening to the undertaking to protect wildlife. The state has furthermore improved management organs, increased capital input for the protection and management and successively promulgated a series of laws and regulations for the protection of wildlife, hence putting the work of protecting and managing wildlife on to a sustainable orbit. In this sense, China has insisted most of the optical prohibitions on the entry, access and use of natural resources giving few opportunities to privates and communities in what it refers to as management and

participation, unbalancing a little the famous defended sustainability.

Wildlife management poses a particular management challenge because wildlife has an impact not only on people residing in close proximity to species but also has wider impacts to more distant communities. As a consequence, the costs and benefits of wildlife utilization differs between people living with wildlife and people living outside wildlife areas. Hence, what is an optimal utilization of wildlife from a regional, community or individual perspective differs from a country or a global perspective.

3.9 Impacts on Protected Areas

The benefits and administrative costs of protected areas are well documented in academic literature and popular media. The advantages of biodiversity protection/conservation, clean air, ecotourism and the preservation of natural and cultural heritage for posterity are widely acknowledged. However, potentially adverse socio-economical, environmental and eco-tourism consequences of the protected areas are less well known. Protected areas frequently require the eviction and exclusion of local groups, sometimes conflicts of various orders, but do not always compensate for or properly assess the costs involved. Since protected areas cover more than 10 % of the earth's land surface and since more are mooted adequately to protect a representative sample of the world's ecosystems, assessing the impacts of current costs and establishing a framework for evaluating future costs is an essential task (IUCN, 2004).

3.9.1 Socio-economical impacts

The impact of protected areas on local society and economy has variable but growing recognition. The international conservation community voiced in the Durban Accord the concern "that many costs of protected areas are born locally - particularly by poor communities - while the benefits accrue globally" (WPC, 2003). The Congress made the commitment that protected area management strives to reduce and in no way exacerbate poverty (Kai, 2004).

Yet since their inception, protected areas have necessitated the removal of people. Some more recent parks have involved careful compensation arrangements for people moved to make way for conservation. These are not the norm. Evictions frequently occasion expense, hardship and impoverishment. Assessments of biodiversity conservation in the context of poverty alleviation suggest that protected areas did not reduce poverty, but on the contrary increased the poverty of the rural populations (Cernea, 2003; Brockington and Schmidt, 2004). Compensation for the impoverishment caused by protected areas requires knowledge to know who has been affected and how greatly their lives have changed. Appreciation of the multiple benefits of conservation will be incomplete without a good understanding of the costs involved.

Many studies have been conducted, but the more impressive results were the Forest

Peoples Project (FPP) conducted in seven African countries, including some southern countries, where the conclusion on the implementation of international standards has led to serious impacts on indigenous communities. Such impacts are:

(1) forced expulsions from their lands without compensation;

(2) elimination of their rights over their traditional lands;

(3) progressive destruction of their livelihoods;

(4) loss of their identities;

(5) increasing socio-economic marginalization of their communities.

However, there is a widespread recognition that protected areas which cause harm or inconvenience to local groups will be threatened by these groups' non-cooperation or outright resistance especially in Africa where the level of poverty is high (Shepherd, 2008). For this alternative is the understanding and coordination between state authorities and conservation organisations to find ways in which protected areas can provide real benefits to local groups though they are handicapped by want of measurement and understanding of the costs involved.

As far as Editorial Board of China conservation Strategy, (1990) is concerned, China also faced the same situation as the 1997 statistics shows that about 30 million poor people lived in and around the protected areas. A few other authors have it prohibitions/limitations came since the Qin Dynasty (221–207 BCE) when mountain areas were preserved as imperial hunting reserves and temple (Edmonds, 1994).

3.9.2 Environmental impacts

Protected areas are areas of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means (IUCN, 1994). Therefore, when the objectives fail, the problems appear in various orders:

(1) Air, soil and water pollution;

(2) Habitat degradation, loss and fragmentation;

(3) Invasion of exotic species;

(4) Loss of biological and cultural diversity.

Most of these problems are related to the increase in human use (legal or illegal) increasing in CO_2 levels due to emissions from fossil fuel combustion, aerosols (particulate matter in the atmosphere), land use, ozone depletion, and deforestation inside and outside of protected areas and to the lack of alternative politics and a sustainable development for alleviating poverty. This situation is much more current in developed countries and Newly Industrialized Countries (NIC) such as South Africa and China. These countries, many times, in their development programs leave breaches so that such happens, and mainly caused by lack of financial resources, ignorance or for pure inertia of the governing. In China, for instance, the current environmental problems can be divided into

seven categories: land, industry, energy, water, the controversial "Three Gorges Dam" project, air and population (Changlin Li, 2005). These problems have become exacerbated as today it has become difficult to give priority of choice.

According to the State Environmental Protection Administration, despite efforts to change priorities, the situation is not improving. In some cities, foul air emissions exceed acceptable limits. For example, the structural and industrial pollution in Huang River; Songhua River in the north-east; Huaihe River, which runs north of the Yangtze; Taihu & Chaohu Lake in east China; and Dianchi Lake in Yunnan province in the south-west. Eighty percent of industrial waste deposited into the river comes from mining industries, oil companies, textile factories, chemical plants, food and paper (Changlin Li 2005). The pollutants include huge volumes of wastewater discharged into the river and lake and emission of greenhouse gases such as carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O) and chlorofluorocarbon (CFCs). These pollutants do not provoke problems only on the ecological level but on human health as well (Li Guoying, 2004).

Furthermore, another example would be the Three Gorges Dam project where many ecologists defend that the project will have an irreversible large-scale ecological impact. A large number of species would be affected and some endangered ones would become extinct in the wild, including the Giant Panda, the Chinese Tiger, the Chinese Alligator, the Yangtze Dolphin, the Chinese Sturgeon and the Siberian Crane. Moreover, the project also encourages extensive logging, which would induce deforestation (Mark, 2008; International Rivers Network, 2002).

In relation to the southern Africa, the situation is not as alarming as in China. China emits or releases 21.60% CO_2 in the air while the southern Africa regions, on average emits only 0.3% CO_2, where south Africa dominates with 1.5% of the world total (UN Statistics Division/CDIAC, 2006). The low CO_2 emission in the southern Africa is due to the fact that they had the knowledge on how to coordinate between the development/integration of the protected areas and in relation to other activities mainly in the mining sector and processing of mineral resources such as gold, manganese and uranium, earlier. Additionally, it is also due to the government's concern with environmental protection such that Mine and other polluting sectors, in Southern Africa, are subject to regular inspection and inspectors have the power to suspend operations where necessary (MacGregor, 2006). Also the government has the right/power to refuse authorization if it considers that potential environmental risks outweigh the economic benefits of a project. This has given solutions to creations and inventions of technologies primarily in mining locally to minimize effects on environments (MacGregor, 2006). These, altogether verifies that the management model "MANAGE IT!" is put into practice together with the framework for assessing management effectiveness of protected areas.

3.9.3 Effects of the impacts on ecotourism (development)

Ecotourism is environmentally responsible travel to relatively undisturbed areas in order to enjoy and appreciate natural and cultural features, while promoting conservation, low negative visitor impact and beneficial socio-economic involvement by local populations (Ceballos, 1996). Eagles et al. (2002) has it that protected areas play a significant role in world-wide tourism as they are an important destination for some of the fastest growing tourism segments, namely nature-based and culture-based tourism and ecotourism. The major attractions associated with protected areas are intact and diverse nature, landscapes, biodiversity, National Parks, World Heritage sites and increments in prominence, cultural and historical values.

In nowadays, the ecotourism is becoming too popular, especially in protected areas where wildlife concentration is easier to observe, but the quantification of consequences of associated disturbance has been seldom in the short-term, making the sustainability of this activity untested.

In 2004, ecotourism grew three times as fast as the tourist industry as a whole, but now only one out of five tourists goes on eco-holidays (Andy, 2008). It has been shown to have an impact on a range of species, both inside and outside of protected areas. However, the upside of ecotourism is that its revenue provides one of the best incentives for local communities to protect endangered animals instead of hunting them (Adina and Sarah, 2008). For this, although ecotourism is intended for small groups, even a modest increase in population, however temporary, puts extra pressure on the local environment and necessitates the development of additional infrastructure and amenities. The construction of water treatment plants, sanitation facilities and lodges come with the exploitation of non-renewable energy sources and the utilization of already limited local resources (Baumol and Oates, 1977).

The conversion of natural land to such tourist infrastructure is implicated in water and air pollution, acid rain, soil erosion, deforestation and loss of biodiversity in Yunnan province-China, Hoopoe Safaris in the Lake Eyasi area of Tanzania and physical displacement of persons, gross violation of fundamental rights, and environmental hazards in Southern Africa (Stephanie, 2002; Erwei, 2004; Miller, 2007). In other cases, the environment suffers because local communities are unable to meet the infrastructure demands of ecotourism.

3.9.4 Management and resolution conflicts in protected areas

Studies by Hough (1988) and Lewis (1996) shows that in order to reduce conflicts between parks and local people and animal and population the following actions are crucial. Firstly, promoting dialogue between managers of protected areas and local communities, involving affected stakeholders in protected-area project planning and implementation.

Secondly, identifying areas of common interest between protected areas and local communities, including community representatives on advisory management boards for protected areas. Such programs are attractive not only because they are relatively easy to implement but also because they are fairly inexpensive. Recent conflict resolution initiatives in areas adjacent to the Bwindi Impenetrable and Mgahinga Gorilla National Parks in Uganda indicate that such activities can greatly reduce tensions between local communities and park authorities (Wild and Mutebi, 1996).

3.9.5 Conflicts between people, livestock, wildlife and natural resources

Following the increasing human demand on land-based resources, there exists competition between man and man, and between man and natural resources, such as wildlife. As a result of land use pressure for agriculture, livestock production, mining and settlement, some protected areas are becoming increasingly encroached (Adams and Hulme, 2001). It is important to point out that there is probably no region on earth where animal health policies and their downstream consequences have had as tangible an effect upon the biotic landscape as in Africa, southern Africa in particular as well as in region of China concretely in western China (Sichuan, Guangxi, Yunnan, Inner Mongolia, Guizhou, Shaanxi and Chongqing) (McNeely and Jeffrey, 2005).

Conflicts between people, livestock, wildlife and the environment have remained a sensitive issue in many parts of Africa, especially in East Africa. These conflicts arise from the use of shared natural resources that have been increasingly dwindling during the last few years. The latter is associated with an increasing human population, changes in land-tenure systems and land use moving increasingly towards agro-pastoralism and sedentarisation of formally migratory groups of pastoralists. For example, Western China is the main grass region that covers 84.4% of the total grassland (SoE China, 2000). However, due to pursuit of short-term economic interests, the phenomena of overgrazing and overloading in western provinces cause pasture degeneration and quality reduction. At the same time, the species of beneficial plants drop heavily while the contaminated plants grow quickly. Up to now, the degraded pastures have reached to 3.31×106 km^2 occupying 23% of the available grasslands in western China (Jiyuan Liu, 2007).

Furthermore, there exists conflict between people and wildlife, in Asia for example, where elephant survival is greatly threatened. This conflict, which can be fatal for both sides, has resulted mostly from the loss of elephant habitat to logging, agriculture, infrastructure development and human settlement and China is one victim where it only remains stories and citations. The more current example would be the Chang Tang Region of Tibetan plateau where snow leopards and local brown bears are causing terror in both animal and human population. This conflict incurs costs to the Tibet Forestry Bureau and local partners as they need to provide victims with partial compensation for their losses,

mainly loss of livestock or home damages (WWW China, 2008).

It is to enhance that human and big beasts have lived side by side in Africa as in Asia since the dawn of our species but rapid population growth is now stoking friction with dangerous animals. In some African regions the over exploitation of elephants for their ivory has been a major factor in the massive population declines over the past two hundred years. Although hunting has decreased since the ivory ban came into effect in 1990, elephants are still hunted both legally and illegally for their tusks and this exploitation remains a problem. Habitat loss and fragmentation is now considered a serious threat to surviving elephant populations (Marris, 2007).

Rapid growth of human populations, particularly in West Africa and the fertile east African highlands during the twentieth century and the extension of agriculture into rangelands and forests have brought humans and elephants into direct conflict. The vast majority of elephants occur outside protected areas while human-elephant conflicts occur when farming activities take place within this range. For instance, when elephants try to follow traditional migration corridors in search of food, they end up finding roads, fields and villages, where they frequently cause widespread damage to agriculture and water supplies. In some cases they may even injure or even kill local people, who often retaliate by killing the elephants (AfESG, 2004).

However, the conflict is not only with elephants, but also with lions. In South Africa for example, a large group of lions broke out of a private reserve and terrorized poor communities during a cattle-killing spree (The Namibian Newspaper, 2006). Moreover, leopards wander freely in the countryside and South Africa has unfenced populations of hippos and crocodiles just beyond the boundaries of places such as Mkhuze. It is now common in Tanzania to observe evidence of human activities within and up to the edges of protected areas boundaries (The Namibian Newspaper, 2006). In view of all the aforementioned, it is therefore important that conservation strategies continue to identify conservation priorities at the regional and continental levels in addition to the national level.

3.9.6 Conflicting activities across international borders

In order to take advantage of PA systems in neighboring countries China has already established coordinating agreements with transboundary reserves in some places. For example, with Russia and Mongolia in NE Inner Mongolia, with Russia alone in NE Heilongjiang and with Nepal in the Himalayas (CCIED, 2004). However, there are conflicts with such efforts demonstrated by Chinese logging companies operating across the borders as they are seemingly destroying possible transboundary reserve areas in Myanmar (Monique and Trevor, 2007).

In southern Africa there are type of species of joint ventures between governments of this region and communities. The neighbors to relate in peace and harmony, both parties

demonstrating willingness to contribute and build the protected areas and other resources defined in the process of extinction. As a proof of this, they have developed many projects together (Jackie, 1999).

In a typical top-down approach, government officials have dominated the process leading to the establishment of the Transfrontier Conservation Areas (TFCAs), Transfrontier Parks (TFPs) and Transboundary Protected Areas (TBPAs). Currently there are at least four officially established TFPs; the Kgalagadi between Botswana and South Africa; the Maloti-Drakensburg between Lesotho and South Africa; the Great Limpopo shared by Mozambique, South Africa and Zimbabwe; and the Nyika between Malawi and Zambia. These TFPs are being developed on the principles of a Category II protected area, which according to IUCN (1994), is an area designated to: (1) protect ecosystems integrity, (2) exclude exploitation or inimical occupation for the purposes of designation of the area, (3) provide a foundation for spiritual, scientific, educational, recreational and visitor opportunities.

4 CONCLUSION AND RECOMMENDATIONS

4.1 Conclusion

Protected areas remain the fundamental building blocks for virtually all national and international conservation strategies, supported by governments and international institutions such as the Convention on Biological Diversity. They are also necessary in the use of management models that better answer the challenges of the industrialization and globalization of the modern times. A comparison between the management models for protected areas for China and South African regions has been presented in this paper. Based on this paper, it can be concluded that there are differences and similarities in the management models for protected areas in these two places. One of the differences is that in China all the protected areas are state owned whilst in South African regions there are some protected areas that are privately owned. Regarding similarities, both protected areas needs political support and local acceptability for their effective functioning or even for establishment.

In what touches the use and practicability of the management models we cleaned the following points:

(1) In any circumstance the management models work as one conducted prescription, they are always susceptive changes in space, place, time of application and endogenous and exogenous factors;

(2) The successful use and their applicability depends on the dynamics and the ability to put into practice adaptive management, combine different parameters such as biodiversity monitoring and environmental education, and collaborate with the community and other actors/stakeholders in core of management added to the model or typology of governance;

(3) The Management of protected areas has often been based on models that exclude the local resident populations and perceive their concerns as incompatible with conservation/protection.

(4) The models or typology of "governance" that combine co-management or collaborative management, community-conserved areas and private protected areas are subject to greater success than those who use exclusively government management, and can help design planning and management.

(5) Unsuccessful management models have a tendency to be propitiates in majority of the times of the regions with a certain degree of industrialization and regions with great population agglomerates, where the principles that guide the models are ignored.

4.2 Recommendations

The paper failed to answer the third objective that is to put value and appraisal on the diversity of nature as an inexhaustible source of natural construction plans and evolutionary strategies that have proofed to be successful in many generations test run. The failure resulted from shortage of data sources and thus, further studies are highly recommended in this regard.

In addition, a particular scholar stated that the ultimate test of a moral society is the kind of world that it leaves to its future generations an asset with a solid base and well-defined principles of continuity. Hence, following the logic of this expression we recommend:

(1) Recognition and uniformity of laws governing protected areas and management standards and presentation annual or biennial of report of the financings and budgets of the same, by department of environment or entity capable of such as IUCN, WCPA and others.

(2) Promotion of creation of national foundation to support some environmentally-sound resources development industries, such as eco-tourism and purchasing right of land use. The foundations alike can also be set up in provincial and municipal levels.

(3) Mobilization of all forces available to solve the pollution problems that are causing serious harm to people's health and environment in general.

(4) Encouraging the IUCN-World Commission on Protected Areas, national and international non-governmental organizations, and other expert institutions and agencies to enhance activities toward organizing and forming regional technical support networks to assist countries in implementing the programme of work essentially by:

① Making available tools and guidance;

② Facilitating the sharing of information and knowledge;

③ Coordinating sub-regional workshops;

④ Convening regional/sub regional technical on key themes of the programme of work on protected areas and management models.

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List of Acronyms and Abbreviation

AfD French Development Agency

AfESG African Elephant Specialist Group

ASEAN Regional Center for Biodiversity Conservation

BOCOG Beijing Organization Committee for the Olympic Game

CBNRM Community-Based Natural Resource Management

CCICED China Council for International Cooperation

CICED   China Council for International Cooperation Environment and Development

CEAD   Environment, Agriculture and Development

CITES Convention on International Trade in Endangered Species

CNEPP China National Environmental Protection Plan

CNR Co-management of Nature Resources

DWAF South African Department of Water Affairs and Forestry

EFCAs Ecological Function Conservation Areas

EIAs Environmental Impact Assessment

FFI China Programme Office

FPP Forest Peoples Project

GDP Gross Domestic Product

GEF Global Environment Facility

GIS   Geographical information system

ICDP Integrated Conservation Development Project

IFMs Innovative Financing Mechanisms

IITA International Institute of Tropical Agriculture

IOC International Olympic committee

IUCN International Union for Conservation of Nature Resources

KfW German Development Bank

MAFF/ME Ministry of Agriculture, Forests and Fisheries/Ministry of Environment

NBSC National Bureau of statistics of China

NPC National People's Congress

NR Nature Resource

Pas Protected Areas

PATF Protected Areas Force

SADC Southern African Development Community

SEPA State Environmental Policy Act

SEPA Division of Environmental Supervision and Management

SLHSs Scenic Landscape and Historical Site

SPSS Statistical Package for the Social Sciences

TBPA Transboundary protected areas

UMT University of Montana

UNESCO United Nations Educational, Scientific and Cultural Organization

WCPA World Commission on Protected Areas

WDPA/WWF World Database on Protected Areas / World Wildlife Fund

WFP World Food Programme

ANNEX

Table 1- Nature Reserves in China (Up to the end of 2006)

Province	Amount					Area (ha)					% of Land area
	NL	PL	CiL	CL	Total	NL	PL	CiL	CL	Total	
Beijing	1	12	6	0	19	4660	91498	36150	0	132308	7.86
Tianjin	3	6	0	0	9	100949	63436	0	0	164385	14.50
Hebei	8	20	2	5	35	105802	457800	8806	24626	597034	3.19
Shanxi	5	40	0	0	45	82936	1045392	0	0	1128328	7.22
Inner Mongolia	21	54	33	84	192	3489958	7435568	436311	2128068	13489905	11.50
Liaoning	11	28	33	17	89	1162126	838786	691373	95652	2787937	10.91
Jilin	9	15	4	5	33	679081	152328	8779	18831	2229929	12.34
Heilongjiang	15	53	35	73	176	1709320	2427017	419367	866025	5421729	11.93
Shanghai	2	2	0	0	4	66175	27646	0	0	93821	14.79
Jiangsu	3	10	8	17	38	336211	111684	128832	116217	692944	6.75
Zhejiang	9	8	0	35	52	96724	125915	0	41768	264407	2.59
Anhui	6	27	9	2	35	164282	263652	0	6708	434642	3.34
Fujian	11	28	7	47	93	187760	155845	75354	88544	507503	3.06
Jiangxi	5	25	1	103	134	81536	346749	1560	491095	920940	5.53
Shandong	5	25	24	21	75	239674	471695	252850	133122	1097341	6.63
Henan	10	19	1	2	32	378941	373931	163	1400	754435	4.52

61

Hubei	7	17	21	18	63	166418	391514	312260	143764	1013956	5.45
Hunan	11	31	0	53	95	415925	433257	0	256439	1105621	5.22
Guangdong	9	49	106	135	299	17513	62383	369064	2277486	3443126	5.64
Guangxi	12	46	3	11	72	221062	944445	118947	141264	1425718	5.89
Hainan	8	25	9	27	69	83637	2635511	1625	7815	2812168	5.28
Chongqing	3	19	0	28	50	195512	373362	0	347634	916508	11.14
Sichuan	20	64	31	49	164	1593112	3969115	1453108	2053496	9068831	18.57
Guizhou	7	4	22	95	128	217308	70453	276344	385820	049925	5.40
Yunnan	16	52	71	59	198	1431215	1888471	557307	349846	4226839	10.73
Tibet	9	6	1	22	38	37153065	3816144	70	1504	40970783	34.14
Shaanxi	7	36	4	3	50	266452	683356	61534	34602	1045944	5.08
Gansu	13	40	0	4	57	6861230	2907645	0	114900	9883775	21.68
Qinghai	5	6	0	0	11	20252490	1506820	0	0	21759310	30.20
Ningxia	6	7	0	0	13	439208	67575	0	0	506783	9.78
Xinjiang	8	19	0	0	27	13339066	8349099	0	0	21688165	13.55
Total	265	793	422	915	2395	91697028	44418002	5224384	10195626	151535040	15.16

Source: Department of Natural and Ecological Conservation, SEPA, 2006 Note: NL refers to national level; PL refers to provincial level; CiL refers to city level and CL refers to county level.

Table 2 Type of Nature Reserves of China in 2006

Type	Amount		Area	
	Amount	Percent (%)	Total area(10.000 ha)	Percent (%)
Natural ecosystem	1593	66.51	10366.45	68.41
Forest ecosystem	1205	50.31	3362.37	22.18
Grassland and grassy marshland ecosystem	45	1.88	319.39	2.11
Wilderness ecosystem	25	1.04	3966.78	26.18
Land Wetland and water ecosystem	250	10.44	2616.42	17.27
Marine ecosystem	68	2.84	101.53	0.67
Wild biological species	669	27.93	4609.08	30.42
Wild animal reserve	511	21.34	4318.46	28.50
Wild plants reserve	158	6.60	290.62	1.92
Natural relics	133	5.55	177.97	1.17
Geological relics	101	4.22	125.55	0.83
Ancient extinct life relics	32	1.34	52.43	0.35
Total	2395	100	15153.50	100

Source: Department of Natural and Ecological Conservation, SEPA, 2006

Table 3 Parks, Reserves and other Protected Areas in Southern Africa (terrestrial), 2009

Type of PA	Country				
	Namibia	Zimbabwe	S. Africa	Botswana	Mozambique
*Proposed/Transfrontier Park	1*	2	4+2*= 6	2	1+1* = 2
National Park	5	11	21	4	
National monument	1	1			8 + 1* = 9
*Transfrontier/ Game Park	7+1* = 8	2			
Forest Reserve	3			6	16
Recreation resorts	6	19			
Reserve/*Hunting reserve	3				12
Wetlands of international importance	5			1	
Cloud forest sites		3			5
*Game/*Bird/*wild life/ sanctuaries	25+1* = 26			4	
Protected forest		6			
Botanic gardens		3			
State forestry		44			
Botanic reserves		14			
*Safari areas		16+1* =16			
World heritage convention/		6			5 + 2* =7
Designation not know /*Wildlife reserve		2			
*Private/Game reserves /*Private ranches				10	11+ 6* =17
Wildlife utilization/ *Games management					2*
Total	58	139	27	28	70

Source: (WCPA), 2009

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Claudino da Veiga Mendonça, male, born in May 1969, native of the parish of Saint John Baptist municipally of Praia-Santiago and capeverdean nationality, professor and part of the Ministry of Education.

On July 28th 1998 concluded degree in Geography at ISE (Superior Institute of Education) whose final work entitled: Climatology Applied to the Tourism. The case of the island of "Santiago".

Between 1997 and 2004 participated in various activities formations in the area of environment protection, seminar about the volcanic eruption happened at the Fogo Island in S. Felipe city and structuring of the discipline of geography.

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Also He was director of Nature Reserve and National Park Branch of Chinese Ecological Society and council member of China Wildlife Protection Association, Beijing Forestry Society and Chinese Museum Society.

ACKNOWLEDGEMENT