Final Report of the International Internship in Kenya August 26th – September 7th, 2013

Edited by SUN Xiaogang, MURAKAMI-SUZUKI Rie And participants of the 2013 Kenya Internship

Master's Program in Environmental Sciences
Doctoral Program in Sustainable Environmental Studies
University of Tsukuba, Japan

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Acknowledgement

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We would like to express our deep appreciation to all of the above.

Kenya Internship Participants
Environmental Diplomatic Leader Education Program
Graduate School of Life and Environmental Sciences
University of Tsukuba
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Aim and Achievements of the Kenya Internship 2013

The EDL Kenya Internship was held between Aug. 26th and Sep. 7th 2013. Two EDL professors and 9 students participated in the internship. This is the second time to hold internship in Kenya and two major environmental problems; urbanization related environmental problems and nature conservation are focused. During the internship, the EDL students worked hard to examine the actual situation, understand the reality of local people, and learn directly from specialists who are dealing with these problems.

The first half of the internship was held in Nairobi, the capital city of Kenya. We first visited the Department of Geology and Environmental Science of University of Nairobi, where we had lectures on geography of Kenya and urbanization related environmental problems of Nairobi. And then we visited city center with students from University of Nairobi. On the second day, we visited headquarter of UNEP and had five lectures from environmental diplomatic specialists who are in charge of projects of bio-diversity conservation, policy-making and environmental and economic development. We also visited Karula forest in the afternoon. Here we learnt not only how the Nobel Peace Prize winner Dr. Wangari Maathai spent her lifetime to protect the forest from developers, but also other efforts made by both the international diplomacy and local NGOs to forest conservation. On the third day, we visited headquarter of Kenya Wildlife Service and had lectures on the history of wildlife conservation, current policy and environmental education of Kenya.

The second half of the internship was supported by the KWS (Kenya Wildlife Service) scientists and held at the Amboseli National Park. The Park is regarded as a biological hotspot of the Kilimanjaro ecosystem, the key tourism income resource of Kenya, and the place where indigenous culture and livelihood are practiced. Here we found different stakeholders, such as national and local government, international conservation agencies, local NGOs, and communities of indigenous people, were involved in wildlife conservation issues. The EDL students learnt conservation and development issues, biological and cultural diversity issues, and the importance of negotiation among different stakeholders.

Finally, before leaving for Japan, we held a joint workshop with JSPS Research Centre in Nairobi. Each EDL student gave a presentation on one specific topic he/she learnt from this internship. About 40 researchers from both Kenya and Japan attended the workshop. We received many suggestions and successfully closed the internship.

Dr. SUN Xiaogang
Associate Professor of EDL Program
University of Tsukuba

Contents

Part I

Urbanization, Economic Development, and Environmental Problems in Nairobi

Chapter 1: Traffic and Air Pollution in Nairobi City, Kenya

SHI Wansheng

Nairobi city, the capital of Kenya is now experiencing many problems and challenges just as some cities in the developed countries had been experienced in the past few decades, such as rapid population growth, fast urbanization, environmental deterioration, insufficient transport capacity, etc. In the following report, the traffic and air pollution in Nairobi city was chosen as the main topic and the studies during this internship in Nairobi city will be described as detailed as possible.

1. Nairobi city and the challenges of rapid population growth

Nairobi city was founded in 1899, and then be the capital in 1963, now is growing very fast to be one of the largest cities in Africa and the most populous city in East Africa. According to the population statistics (Fig. 1[(1)]), in the past decades, the population of Nairobi city grew very fast because of the ongoing rural to urban migration and high natural birth rates. Accompanied this population growth, the population density and proportion of Nairobi citizen in Kenya population was increased to be higher and higher (Fig. 2) [(2)]. Although it covers only 0.1 percent of Kenya's total surface area, Nairobi has about eight percent of the country's total population [(2)] and 25 percent of Kenya's urban population [(3)].

The population grew so fast that the local government was unable to provide adequate and high level public services, especially for public transportation construction and environmental protection.

Moreover, Nairobi is the main commercial and largest industrial center of Kenya which contributes to about 60 percent of the GDP of Kenya economy [(4)]. Recently, because of the rapid development of tourism and other industry, the economy of Kenya grows very fast (Fig. 3) [(5)], and therefore, more people get rich to buy more private cars during the economic prosperity. More vehicles on road aggravated the public transportation situation and led to higher levels of air pollution and also traffic jams, these problems caused not only inconvenience but also damage to the body health. Therefore, special attention should be paid to these problems in Nairobi city.

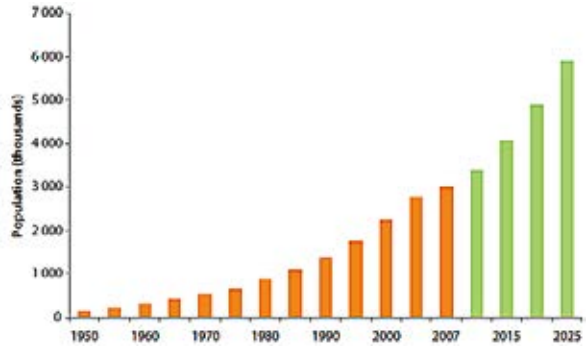

Fig. 1 Nairobi's historical and projected population [(1)]

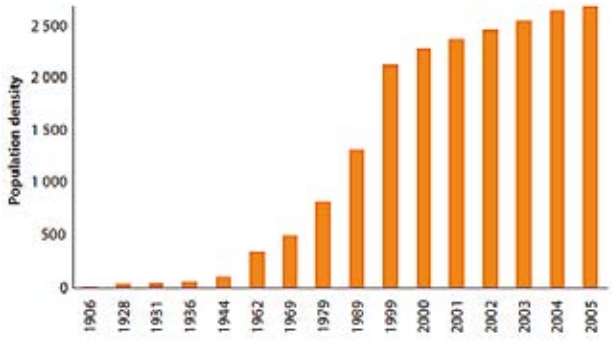

Figure 2: Nairobi's population density, 1906-2005 [(2)]

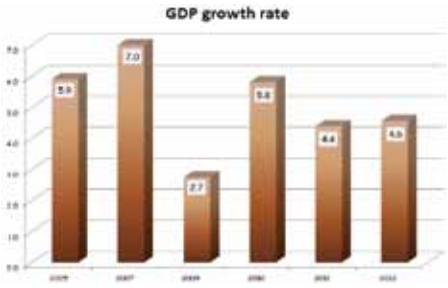

Fig. 3 GDP growth rate of Kenya [5]

2. Traffic and air pollution in Nairobi city

2.1. Traffic situation in Nairobi city

In recent years, the rapid population growth and fast urbanization in Nairobi city resulted in the explosion in the number of cars and other vehicles (Fig. 4) [6]. Unfortunately, the lack of appropriate and effective measures to control the cars on roads resulted in somewhat disorder in traffic. Firstly, so many cars and other vehicles usually all on roads at the same time, especially on the rush hours led to the road full of cars (Fig. 5(a)). Secondly, the two sides of many roads were occupied by private cars and left very little space for traffic making the inherently narrow road to be narrower (Fig. 5(b)). Thirdly, the business on road was not only blocking traffic but also very dangerous. Fourthly, so many people lived far away from the center of Nairobi city but they worked in the city, and therefore they had to commute between the two places everyday driving their cars [7]. More importantly, the number of roads connecting the city and the suburbs was limited, and on rush hours so many cars and other vehicles both flushing into or out the city were all on road, then traffic jams in Nairobi city seemed to be inevitable.

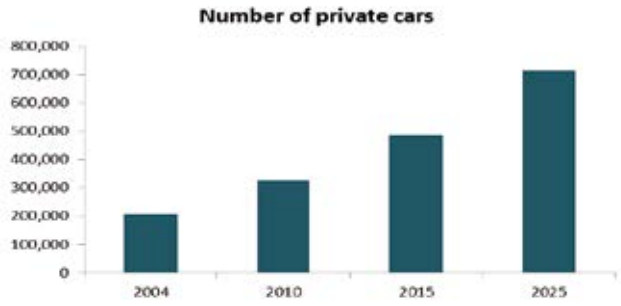

Fig. 4 Private Car Population in Nairobi city

(a)The road full of cars on the rush hour

(b) Roads are occupied

(c) Business on road

(d) The cars lined up on the road

Fig. 5 Cars on roads in Nairobi city

2.2. The relationship between traffic and air pollution in Nairobi city

It was widely recognized that motor vehicle is a very important source of harmful emissions of various pollutants contributed to air pollution in the urban areas. Many pollutants exhausted during the combustion of the fuel, such as CO, nitrogen oxides (NO_2 and NO), Pb, hydrocarbons, fine particles and secondary pollutant O_3, etc. These pollutants in the exhaust were strongly affected by fuel quality, motor vehicle condition and vehicle density on road, and so on. Higher fuel quality and good condition will be beneficial for reducing the pollutants. Meanwhile, the speed decline and the "stop and start" operation increase resulted from traffic congestion with high density of motor vehicle can lead to added air pollution, not to say the increased air pollution caused by more motor vehicles. Therefore, the pollution caused by motor vehicles usually nonlinearly increases with vehicle density on road, and higher vehicle density can make the situation even worse.

Though some researchers had done some work on the air pollution in Nairobi city, the data from air quality monitoring were still inadequate and very difficult to find. Table 1 showed the air quality of Nairobi city [(8)]. For some days, NO_2, O_3 and PM2.5 within the WHO guidelines, but some days these pollutants above the guidelines and the main pollutants in Nairobi city was fine particle (PM10, PM2.5) which above the WHO guidelines for most of the days. Furthermore, Odhiambo etc.[(8)] confirmed that the concentration of these fine particulates and NOx was strongly correlated to motor vehicles density (r = 0.93), indicating that vehicular exhaust was the main source of fine particles and NOx in the air of Nairobi city.

Therefore, sustainable traffic policies should be planned and carried out in the future to control the air pollution in Nairobi city.

Table 1 Air quality of Nairobi city

	Mean concentrations	WHO guideline**
PM10	66.66-444.45 (Mean 239±126)μg/m^3 [(8)]	50 μg/m^3
NO_2	0.011-0.976 ppm [(8)]	200 μg/m^3 (0.10 ppm)
O_3	LLD*-0.1258 ppm [(8)]	100 μg/m^3 (0.056 ppm)
$PM_{2.5}$	10.7-98.1μg/m^3 [(9)]	25μg/m^3

* LLD, means lower level of detection, ** Air quality guidelines - global update 2005 by WHO, http://www. who.int/phe/health_topics/outdoorair/outdoorair_aqg/en/index.html

2.3. Social equality problems

As a kind of public goods, urban transportation service is closely related to every person's welfare, and directly reflects the social equality. However, without effective intervention of the public authority, many things usually go to the other side than what we think. The traffic situation and service in Nairobi city just like that caused some obvious social equality problems.

(1) There is inadequate public traffic service for the poor people in Nairobi city. Public traffic service usually can be seen as a kind of tool to adjust the distribution of social wealth. The inadequate public traffic service and expensive ticket for matatus caused almost half of the total population in Nairobi had no choice but to commute by walk (Fig. 6) [7, 10].

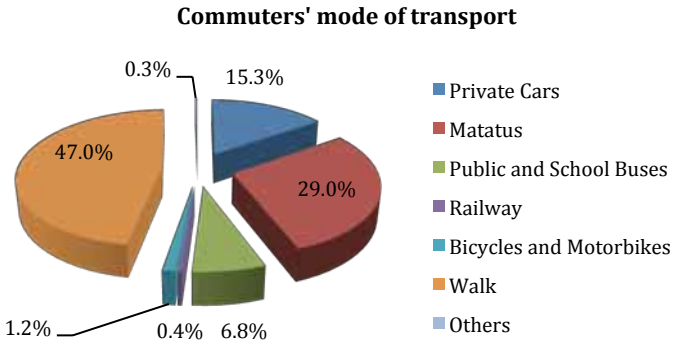

Fig.6 transfer mode in Nairobi City [10]

(2) Pollution cost transferred to the public, especially to the poor who even can't access to the motor vehicles. The pollution cost mainly includes the fee for air pollution control and medical care fee for the damage to health caused by air pollution. As a kind of public goods, everyone lived there can't avoid this cost, and therefore it's unfair for the poor people. From the following process you can find how innocent they are.

Cars and buses → Waste gas → Air pollution → Receivers { Commute by vehicle; Commute by walk }

This kind of pollution transfer appeared everywhere, and with the progress of society, reducing this social equality problem is of great necessity.

3. Analysis and discussion

3.1. Personal interest and public goods- Tragedy of the Commons

Just as the interesting physical phenomena, a box of dropped matches always goes to random and disorder in the atmospheric environment, the society usually goes like that if no effective public policies to regulate it. For the management of public goods, it's the same. As we know, normally everyone wants to do things according to their personal interest in the public space, but this kind of personal choice usually becomes the driving force of "Tragedy of the Commons" leads to the worst social or community interests. Therefore, there must be some kinds of new rules to change their choice.

For the traffic service in Nairobi city, of course most of students I met in University of Nairobi wanted to buy cars in the future, although they knew the traffic was very bad. Many people buy cars for business, convenience, inner satisfaction and so on, then without control these kinds of personal choice inevitably lead to explosion in numbers of private cars.

3.2. Convenience, health and equality

As showed in Section 2, driving cars can bring convenience and at the same time damage to body health and society quality. But the roads and air are public goods, from the nature of public goods and maximization of personal interests, people usually tend to ignore or turn a blind eye to the damage or pollution they imposed on the public resources. Therefore, generally people just think about the convenience brought by cars other than health damage and social equality problems caused. Under this driving force, people can't be aware of the severity of air pollution till obvious damage caused by air pollution to public health. This is challenging the local government's ability of society management.

4. Suggestions and possible measures

In order to avoid repeating the way that the developed countries had experienced, sound plan and effective measures should be carried out in Nairobi city. If nothing is done, then the situation will get worse in the future with the rapid growth in number of motor vehicles. From a long-term perspective, the main idea can be limiting the density of motor vehicles on roads and construct some public transportation as an alternative. Now, there is a very large space for public transport, such as construction of subways, railways, high-speed buses and so on.

4.1. Public transport construct and BOT mode

For developing countries, the huge amount of money for public facilities construction will be the biggest problem, and then private investment would be of great necessity. BOT can be a promising method because firstly, it can collect a huge amount of investment in a very short time from the private sectors for construction of public infrastructures, and secondly it can help clarifying property rights of public goods so that the users pay for it, thirdly BOT mode can improve the transparency and efficiency of public facilities construction.

Fig.7 showed the simple process of BOT mode. The private capital participates in the construction of a project, after construction they can operate this project for a negotiated period to get their principal and profit, and then they transfer the project to the local government completely. This is a win to win investment, and now many successful projects had been built using this BOT mode.

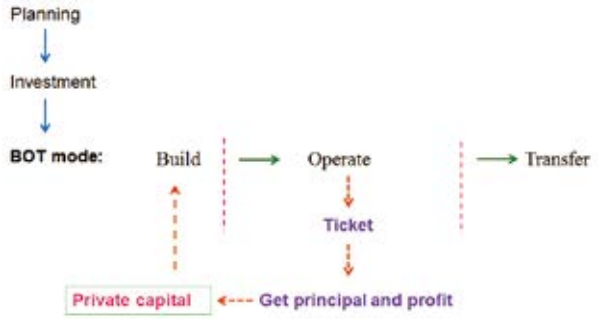

Fig. 7 BOT mode

4.2. Compensate for pollution transfer with pollution tax

Because of the lower energy consumption and pollution, public transportation should be encouraged, and a good economic policy may be helpful for prompting the development of public transfer. Fig. 8 showed a scheme for pollution transfer compensation with pollution tax, from this process, the collected pollution tax can be transferred to compensate for public transportation, and then a cheaper ticket can be provided to the poor. Also, a comfortable and efficient public transportation system would lead to many people leave their cars in their garage other than making traffic congestion on roads.

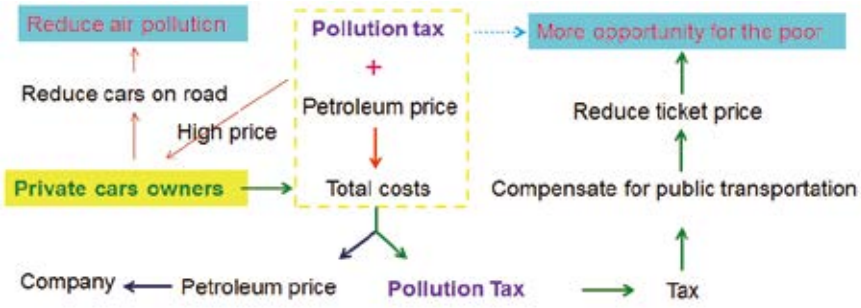

Fig. 8 Scheme for pollution transfer compensation with pollution tax

4.3. Other suggestions

To solve some immediate problems, many measures can be taken, such as turning off the engine in traffic jams, separating people and cars by construct flyovers, prohibiting parking on the road sides at rush hours, constructing more roads for cars, and so on. Also, broadcast real-time traffic information of each main road to remind the drivers to select a relatively more smooth way to avoid traffic congestion.

5. Summary

The development of transport in Nairobi city needs proper guidance and regulation from the local government to lower the levels of air pollution in the future. Public transport should be enhanced and prompted to provide clearer transportation and more opportunity for the poor people in the city. For the construction of public transport, BOT mode can be an efficient method, and the compensation for pollution transfer with pollution tax could be beneficial for the subsequent runs of these public facilities by changing the commute mode. Hope that the traffic in Nairobi city will be better and better.

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Chapter 2: Urbanization Challenges and Threats in Kenya

Temulun

1. Introduction

Kenya, one of the finest safari destination in the world, is situated right along the equator, on the eastern coast of the African continent. Today, Kenya is considered to be the heartland of East Africa. It has a total area covers 581,309 km^2 and has a population of about 44 million in July 2012 (Central Intelligence Agency (2012). "Kenya" . The World Factbook.).

Just like most of the Sub-Saharan African countries, Kenya has a high urbanization rate. Cities including Nairobi and Mombasa, are growing beyond their capacity to provide decent housing to new arrivals. We can see from Figure 1 that Nairobi has many tall buildings, and the city was crowded with people and cars when we went across the streets in Nairobi city.

Fig.1 Nairobi City

Urbanization, a major structural phenomenon responsible for shifting increasingly larger proportions of the population to commercial and administrative centers during development, promotes peculiar energy needs and use tendencies.

The world is undergoing the largest urban growth in history. In 2008, for the first time, more than half of the world's population have been living in towns and cities. By 2030 this number will reach to 5 billion, with urban growth concentrated in Africa and Asia. While we pay much attention to the mega cities, most of the new growth will occur in smaller towns and cities, which have fewer resources to respond to the magnitude of the change. From Figure 2 we can see that the population in Kenya have a clear tendency of increase year by year, population in urban area also increase as well. By 2030, the population in urban and rural area will reach an equal point, and after that, more and more people will live in urban cities rather than rural area.

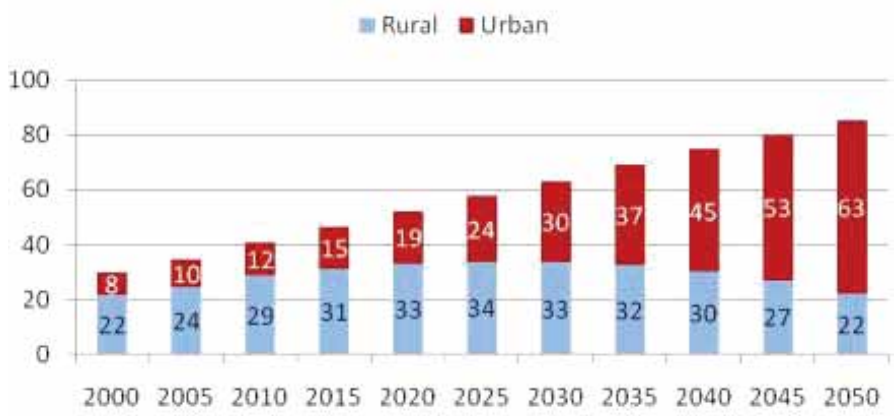

Fig.2 Population trend in Kenya (http://blogs.worldbank.org)

2. Population growth challenges

Population growth has a big effect on urbanization because the land is limited as well as food and houses.

Population in Kenya, which includes more than 70 tribes and peoples, has increased rapidly during the past half century. It is said that growing rate is approximately one million people per year. Along with growing number of people food security become a problem. “Two to four million people receive food aid annually. Only about 20 percent of Kenyan land is arable, yet maximum yields have not been reached in these areas, leaving considerable potential for increases in productivity.”(http://www.feedthefuture.gov/country/kenya). Land use policy, in some sense, will become more important to the people. Agriculture is the backbone of Kenya, but since there is limited arable land, also lack of technology, how to utilize land effectively becomes a challenge. Population is growing at a very high speed, food shortage spread across the country. Thus changing natural land into farming land is happening in Kenya. It will affect not only humans, but the whole ecosystem. Farming need more water, people will use water from the nearby lakes and rivers; And the product of farms will attract wild animals and sometimes wildlife do harm to the nearby livestock. So this may turn to human and wildlife conflict. Extension of human land will decrease wildlife’s living area. This will be a very serious problem in future and many scientists in Kenya already working on this problem. They want to protect varies wildlife from losing their habitat.

3. Transportation system challenges

Nairobi's traffic jams cost the Kenyan economy about $600,000 per day in form of lost productivity, fuel consumption, and pollution (Source: Nairobi City Council). Kenyans own more cars compared to ten years ago, it is a good sign, people can enjoy driving around the city. But on the other hand, overtaking on the wrong side of the road, driving the wrong way, or dodging boulders placed to stop vehicles from using unfinished bypasses are common in Nairobi. At night, traffic lights are ignored, the streets become very dangerous, stopping is seen as an invitation to be mugged. It is reality in Nairobi. During our internship in Kenya, we have been in and out of Nairobi city for several times, and we experienced a long time traffic jam we never expected. The afternoon traffic jam starts from 4:30, because the work off time in Kenya is 5 P.M., if people want to avoid traffic jam, they have to

leave very early or wait until 9 in the evening. As Figure 3 shows, we were waiting in a long time in our bus, and driver complained that it happen everyday, and if it rains the situation become worse. He also told us do not open the bus window because there are dangerous people walking around the cars. The challenges for the transportation is not only because of more cars appear, it is related to drivers and the roads. People who tend to get a driving license study in driving school, they should be provided more transportation rules, and the government may be more concern about how to build roads to release such a big pressure.

Fig.3 Traffic situation in Nairobi

4. Waste management Threats

The mushrooming of informal settlements in most urban centers aggravates the challenge of managing solid waste. These settlements lack modern sanitation facilities, have no access roads and regular collection schedule by local authorities. Consumption patterns due to rising social economic development have introduced large portions of non biodegradable waste to the environment. Municipal waste generated in the urban centers emanates from both industrial waste and residential areas with industrial waste adding up to 21% and residential waste 61% of the generated wastes. 40% of waste generated in the urban centers is collected and disposed of at designated disposal sites. The rest of waste containing heavy metal salts detergents and medical waste is dumped in unsuitable areas or disposed off in rivers that transverse. Some of the municipalities do not have designated disposal sites. The mode of waste transportation is not regulated and lacks coordination.

In Nairobi, a large percentage of solid waste is managed by the private sector and NGOs due to public-private partnerships. The city council’s solid waste department, like those in Kampala and Dar es Salaam, is not well equipped, with transport vehicles few and often poorly serviced, despite increasing waste quantities due to rapid urbanization. Understaffing and a lack of skilled staff in waste management is also a challenge. (http://www.irinnews.org)

As we exchanged some ideas with students of University of Nairobi, they have a common complain is that the waste disposal and the bad smell of it. They told us they have the volunteer activity once a week to clean up the streets and the school yards. Also they hope that the government should provide more facility to deal with this problem. But the population growth make it very hard to achieve such a goal in near future.

5. Slums

A slum is a heavily populated urban informal settlement characterized by substandard housing and squalor. Slum has following characteristics: Inadequate access to safe water; Inadequate access to sanitation and other infrastructure; Poor structural quality of housing; Overcrowding; and Insecure residential status. (UN-Habitat, Kenya, April 2007). Slums are the result of rapid urbanization. People migrate from rural area to urban cities, but they have no job, and no money for purchasing houses and food. So this may be the very reason for the start of the slums.

We saw one big slum on our way, but we never get a change to enter it. Since slums are very dangerous, young people who lives in slums, they have no money to go to school, or cannot find a job, they can't afford food by themselves, so they tend to rob others on the streets, or in slums. So this is also an aspect that reflects urbanization problem.

6. Conclusion

Kenya Vision 2030 is the country's development programme covering the period 2008 to 2030. It was launched on 10 June 2008 by President Mwai Kibaki. Its objective is to help transform Kenya into a "newly industrializing, middle-income (income exceeding World's average currently at US$10000) country providing a high quality of life to all its citizens by 2030 in a clean and secure environment." (http://en.wikipedia.org/wiki/Kenya_Vision_2030).

But Future is not promising, with more population take up much of the limited land, the environment will under much pressure than today. So sustainable development, such as family planning, city planning is really important for Kenyans to live a better life in future. We all hope such a beautiful country to be safe and develop as well as protect what they have today.

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Chapter 3: Challenges for Sustainable Environmental Development in Kenya

LU Mengqian & Nika KOYAMA

1. Introduction

This report describes the contradictions between developing social economy and natural environment in Kenya, some solutions based on local situations will also be introduced in the following chapters.

It is divided into two parts: the first part written by Mengqian LU is mainly concerned with managements of wildlife conservation, vegetation and biodiversity. During this internship, we've visited Nairobi city and Amboseli National Park where we got valuable experiences and data from Kenya Wildlife Service and Maasai Wilderness Conservation Trust.

This part is focusing on the problems facing by local government and organizations in environmental conservation, some solutions developed by local people themselves also have been listed in the corresponding chapters. Although most of them could not be completely solved by now, we can also tell the wisdom in dealing with the problem of environment from Kenyan.

Through this part, we hope to introduce some helpful experiences and advices for the developing areas facing the same problem, and it would be better if this paper could give some inspirations to the one who is studying on this area.

In the second part, Nika KOYAMA will introduce the education in local area and some interviews with Kenyan.

Ⅰ Environment

2. History of Biodiversity in Kenya

Kenya is in the east of Africa and its southeast coastline borders on Indian Ocean. Except the flatlands in the coast area, most of the territory belongs to highland. Although the country is in tropical monsoon region, due to the influence of high altitude, it is basically under the tropical savanna climate.

The area of the forests covers 87, 000 square kilometers (including 1, 174, 000 square hectometers' natural forest), which is about 15% of the territory. There are also many rare species of plants in Kenya like Uganda Juniper. The wildlife resources of Kenya are also abundant (Figure1), like the famous 'Big Five': lion, cheetah, buffalo, elephant, rhinoceros.

Since 1963, the independent of Kenya, the government have legislated to protect wildlife from poaching. Rigorous policies have been established to conserve biological resources, after that, more than 59 national parks/nature reserves were built one after another, made Kenya one of the most popular places for enjoying the natural beauty and seeing wildlife. The total area of national parks/nature reserves covers 8% of the territory, which can be regarded as the most of the world[2]. These beautiful parks comprise the famous Amboseli National Park (which is the home of more than 50 kinds of mammals and 400 kinds of bird, in the cloudless morning, tourists also have chance to see

Kilimanjaro, the highest mountain of Africa)and Lewa Wildlife Conservancy (which is the perch of 12% of Kenya's black rhinoceros and has the biggest independent population of grevy zebra)[2].

Figure 1: Abundant Natural Resources in Kenya
Left: Amboseli National Park/Right: Karura Forest

3. Ecological Environment Conservation Organization

There are many environmental organizations in Kenya who are doing their jobs in different areas. Some of them belong to the government or internationalism, some of them are supported by private funds. But there's no question that they have the same target: to protect this natural and beautiful land. We were lucky to visit some of them during this internship.

3-1 Kenya Wildlife Service (KWS)

Since tourism is the second largest pillar industry of Kenya, the wildlife resources must be legitimately managed. Kenya Wildlife Service is a state corporation established by an Act of Parliament Cap 376 , its mission is not limited in conserving and manage wildlife, it's also responsible for enforcing related laws and regulations and managing the local tourism. KWS manages 8% landmass of Kenya, including 23 terrestrial National Parks, 28 terrestrial National Reserves, 4 marine National Parks, 6marine National Reserves and 4 national sanctuaries. During our internship in Kenya, we have visited their headquarters in Nairobi and Amboseli.

3-2 (Friends of Karura Forest) FKF

With the purpose of protecting the Karura Forest and providing the safety and enjoyment of people,

The Friends of Karura Forest is found as a Community Forest Association (CFA) in October 2009. The team now is formed with 25 Community scouts and 4 Tree caretakers. The forest used to be a dangerous place for passing though, in the effort of Prof. Wangari Maathai (who the first African woman to receive the Nobel Peace Prize for her contribution to sustainable development)and FKF, now over 96, 000 visitors come to the forest every year. During the day in Karura Forest, we've been under their kind guide and had a lecture about their history and daily works.

3-3 United Nations Environment Programme (UNEP) in Kenya

United Nations Environment Programme (UNEP) is founded based on the general assembly of the United Nations, 1973. The main target of UNEP is to promote the international environmental cooperations between different countries. After October, 1973, the headquarters of UNEP was moved from Geneva to Nairobi. UNEP in Kenya is mainly working on 6 areas: climate change; disasters and conflicts; ecosystem management; environmental governance; harmful substances and hazardous waste; resource efficiency. Many of their projects are concerned with environmental sustainable development, like advocating agro-forestry and rehabilitation of the Mau Forest complex. In the headquarters of UNEP in Kenya, we had 5 lectures about strengthening the climate-resilience of ecosystems/ecosystem-based adaption/environmental education.

3-4 The Maasai Wilderness Conservation Trust (MWCT)

The Maasai Wilderness Conservation Trust (MWCT) is an organization mainly supported by private fund. They work for protect the biodiversity of east Africa (mainly contains Chyulu Region and Kuku Group Ranch), and keep the balance between tourism/environmental conservation and local Maasai's benefit. During the day in Kuku group, we met one of their team member: DIRK VAN DER GOES, the conservation manager for data management and botany who gave us a lecture about local wildlife conservation.

4. Challenges for Sustainable Biodiversity Conservation

Kenya is a colorful country which has virous kinds of ecosystems: mountains, forests, arid and semi-arid areas, freshwater, wetlands, coastal and marine, they have formed complicated ecological environment. Since the first and second pillar industry are agriculture (although only 7~8% of the land belongs to first-class land, agriculture still makes a contribution as 24% of the GDP) and tourism (provide about 20% of the GDP and 9% of the jobs), most Kenyan citizens depend directly or indirectly on environmental goods and services. As mentioned before, biodiversity conservation has a long history in Kenya, now with development of modern the society, here comes new problem. Sustainable development is still facing serious challenges.

Species	Proportion in Government Protected Areas	Proportion outside Government Protected Areas
Cheetah	20%	80%
Wild dog	33%	67%
Lelwel hartebeest	21%	79%
Grevy's zebra	20%	80%
Hirola	10%	90%
Sitatunga	Saiwa (approx. 30)	Kingwal, Kimondo Kingwal, Yala Swamps, Bundalangi, Lewa
Lion	77%	33%
Bongo	69%	31%
Sable antelope	100%	-
Roan antelope	100%	-

Table 1: Proportion of Wildlife Outside Designated Protected Areas (from KWS[9])

4-1 Outside Designated Protected Areas

Although the government has founded so many national parks and natural reserves, most of the wildlife still beyond the official protection. Based on the data of KWS, only 20% Cheetah, 10% Lelwel hartebeest and 10% Hirola are inside the government protected areas (Table 1).

In the case case of Amboseli National Park, the elephant and zebras always gather around the swamp in the national park to pass though the dry season. But in the rain season (in general situation, the rain season would be March~July/October~November), they may across the frontier, enter Tanzania. Due to the characteristics of migration, it is hard to do the conservation management in fixed area.

4-2 Human-Wildlife Conflict

Human-wildlife conflict is very normal in the boundary of national park, especially between local people and carnivores.

In Kuku's case, after the attack occurred, there will be a professional staff sent there to identify the responsibility, based on the result, the herder will receive corresponding compensation. But in some situation, compensation would not be enough to let the anger flow away, at this very moment, the herder may chose to spread poison with intent. This extreme behavior would cause many wildlife's death (Figure 2). Besides, in traditional Maasai's culture, killing a lion with just a long spear would be thought brave, so that even it was just a hyena killed their goats, the Maasai people will just go for lions, killing them to show their courage, consolidate their position in the tribe. To solve this problem, the government made some small movies and translate them into local language, trying to persuade them not to kill lions. According to the introduction of the officer, the measure really made some effects.

Figure 2: Lions Died of Poison (from KWS in Amboseli[8])

4-3 Population Explosion

In 1960s, there were less than 10 people in per square kilometer in Amboseli area. With the independence of Kenya and development of economy, by the year 2000, the number increased to 11~30 person per square kilometer. According to KWS's prediction, it will explode over 100 person until 2040 (Figure 3). Human beings will fight with wildlife for the remaining living spaces. Urgent intervention is required to stop the park to become an island-displaced wildlife populations and appear the trend of losing biodiversity.

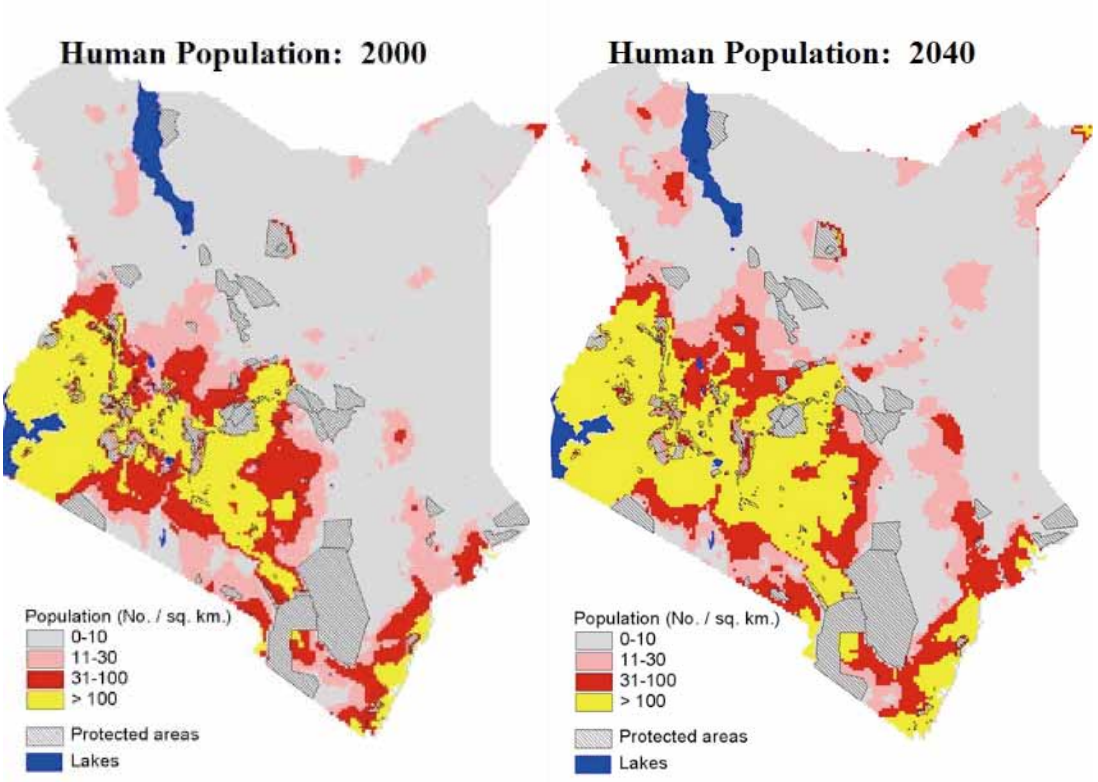

Figure 3: Population in Amboseli Area (from KWS in Amboseli[8])

4-4 Increasing Tourism

As the second pillar industry of Kenya, tourism make a contribution as 20% GDP and 9% jobs every year. The increasing number brings not only huge economic development, but also some new problems. In the case of Amboseli National Park, the appearance of rare carnivores (like lions) will incur more than 10 jeeps stopping to see them. Generally speaking, the carnivores gather for hunting or some other group activities, tourists could disturb their daily life. On the other hand, due to terrorist threats and the unstable political environment of surrounding countries recently, the number of the tourists is in decline. That will be another big challenge for Kenya's tourism.

4-5 Poaching

Poaching is the oldest threaten for wildlife conservation. Some wildlife like Gazelle or Bushbuck are killed for meat, the others like elephant or lions will be killed for envoy and fur (Figure 4). Envoy is very popular in southeast Asia, although the policy for poaching is very rigorous, there are still some people hunting wildlife and smuggle animal products to foreign countries.

4-6 Vegetation Conservation

Except Acacia Farnesiana (the local people call them "Umbrella Trees"), we almost cannot see other kind of tall trees in Amboseli National Park, most of the vegetations are bushes. However, there won't be enough vegetations in dry seasons if no measure is taken to conserve the remaining vegetation.

In the case of KWS of Amboseli, they built a nursery garden to raise pants. It will take several years for one seed grows to a small tree (Figure 5). To cut the budget, the staff usually buries the drop of elephants directly because the elephant sometimes may eat 300 kilogram's everyday, they daily food always contains many seed of different vegetations. There is also an area to raise young palm trees, they've made some special fences wich only cannot be passed by elephant to prevent them eating the young trees.

Figure5: Nursery Garden to Raise Pants (Left)/Special Fence (Right)

4-7 Climate Change

Actually, the climate changes already cause some real problems.

In the case of Amboseli National park, the drought usually occurs and lasts about one year every 4 years, but during 2007~2009, the drought lasted nearly 2 years (Figure 6) and that's the worst ever to be experienced in this area which caused a series of serious problems, especially the attack between carnivores and livestocks.

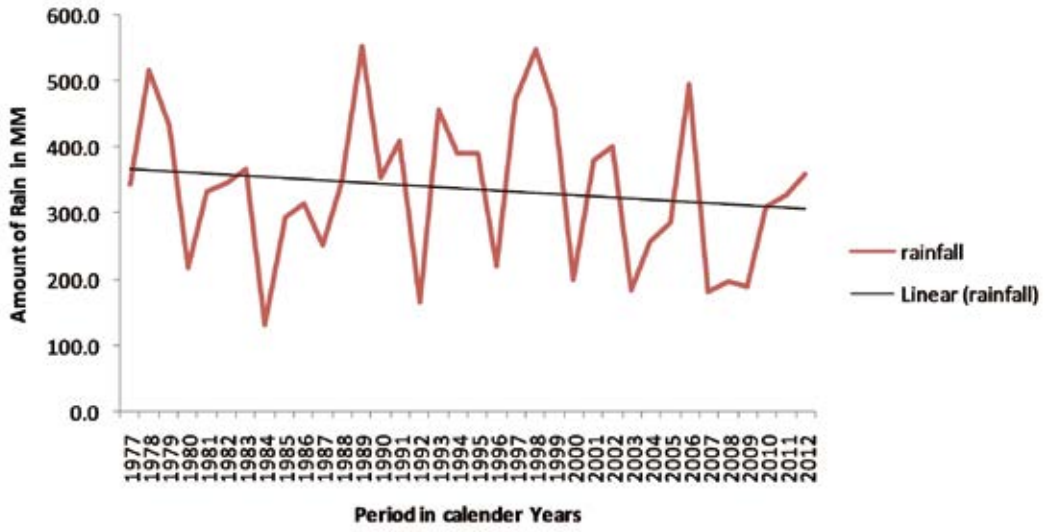

Figure 6: Climate Change Lead to Longer Drought Season (from KWS)

During the question time in JSPS, one researcher mentioned in some areas of Kenya, the government will buy the livestock from local people before the drought occurs, and when the rain season comes, the government will give the same amount of livestock back to the herders, just like a livestock bank, which is very interesting and have local characteristics.

5. Conclusion

Kenya is a country has abundant ecosystem and biodiversity resource. It is very estimable that Kenyan has the consciousness to protect them early instead of saving them after the ecological system be polluted. Developing eco-tourism is a wisdom decision to achieve economic development and biodiversity conservation. But as mentioned above, it's not easy to keep walking on this way. More and more people in Nairobi begin to buy cars which caused serious traffic jam at present; more and more factories have been built outside the cities; Kenya will face more problem not only confined to nature and wildlife conservation, but also puzzling every developing country: population explosion; traffic jams; air/water pollution; unavoidable urbanization. There are so many precious experiences we could learn from the environment conservation works from Kenya, meanwhile, it's also necessary for Kenya to draw on the experiences from other developing countries to solve the new problems.

Ⅱ Education

1. Introduction

Recently of late, industry in Kenya has developed rapidly. The tourist industry which main attraction is big diversity and nature is second biggest income in Kenya. As an inevitable people pays more attention about environmental conservation.

From 2003 primary school fee is free, therefore the percentage of primary school attendance has improved. However education still has many problems. It is the biggest problem that between urban and rural area about quality of education. So, I had questioned "How do children who live in urban and rural area learn environmental problems, how do they consider these problems in developing Kenya?"

2. Method

I interviewed people live in urban and rural areas. That purpose of interview to know what kind of environmental education children receive in each place.

Research filed

Urban area: University of Nairobi, Karura forest, Safari work

Rural area: Kenya wild service in Aboseli, Africa wildlife fund (NGO), MWCT (NGO), Maasi village

Number of people: Urban area000000, rural area 00000

Age of people: 10~25 years old

The case study

“The primary school in Kuku”

I went to 8 fields for research, I describe to focus the primary school in Kuku.

Kuku is one of the massai village, people live with traditional style. The school is managed by MWCT (NGO). I interviewed 6 students; age is 10 to 13 years old. A boy who is 13 years old talked to me, he intends to go to high school to become pilot. He thinks nature is important for business, so people should conserve environment. A girl who is 12 years old does not want to go to high school, she want to stay traditional life in future too.

Students in Kuku, they learn 2 ideas, one is modern idea from school, and another is traditional idea from home. So now they are in between those ideas.

3. Result

Children in urban area: they think that animals and nature should be conserved by

Human. And I sensed they just like animal from their heart.

Children in rural areas: who live in one village think important thinks of nature is just Kept. They live with nature. However other children think nature should conserve, and some children think conservation is just for business. (about modernization)Many children hope to go to urban city for getting better opportunity, some children hope to take over traditional life. However even traditional life is changed by modernization, people use a cell phone, car and PC.

4. Conclusion

Children in urban area do not live with wildlife, just get information about difficult situations environmental. Therefore they could think clearly to conceive of nature, they swallow information.

Children in rural area live with wildlife. Even they took education about environmental problems from school, when they went to home, parents showed the real nature to children. I think they would confuse about environmental.

Children of each type have a different educational problem. Urban children less experiment in nature. They should see real nature their eyes, and meditate about environmental problems themselves. Rural children less information about nature. Many children could not take environmental education enough. Children wanted to know much more about animals, plants, environmental.

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Part II

Nature Environment, Conservation and Environmental Education in Kenya

Chapter 4: How People Adapt to Climate Change?

Yurisa MIKI

1. Introduction

Climate change is one of the most serious environmental problems. Human development cause the big impacts to the nature environment, and the effect of that already appeared all over the world. In this situation, the people have to adapt the change in their own way. The climate change in dry region is more serious problem because water resource is necessary for lives. This chapter describes about the fact of climate change especially in dry region, Kenya, Amboseli. An example society which have high resilient, and important habitat for government or NGOs to communicate the local people are also discussed.

2. Global Scale Climate Change

In Global mean temperature, we have been experiencing some variation. Figure1 shows the variation of temperature measured by proxy and instrument. According to the figure1, rapid rising of temperature in recent years is significantly higher then that before the Industrial Revolution. This picture indicates that the human development causes the rising of temperature.

In addition, precipitation also has changed its spatial distribution, intensity and frequency. Intergovernmental Panel of Climate Change (IPCC) displayed these future precipitation characteristics, moreover, they reported that the potential of drought will more increase in the regions where already has problems of draught. Figure 2 shows the spatial distribution of trend in annual precipitation during 1901-2005. From this figure, the region where have little rain like Sahara and a part of East Africa became drier during last 105 years. Drought causes the direct effects to the local people who strongly depend on nature environment.

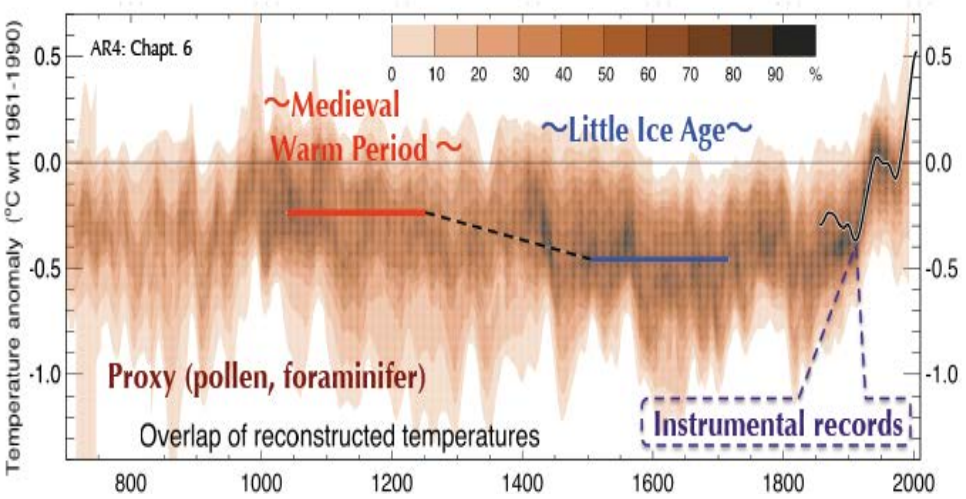

Figure 1. Variation of Global Mean Temperature Anomaly (IPCC,AR4, 2007)

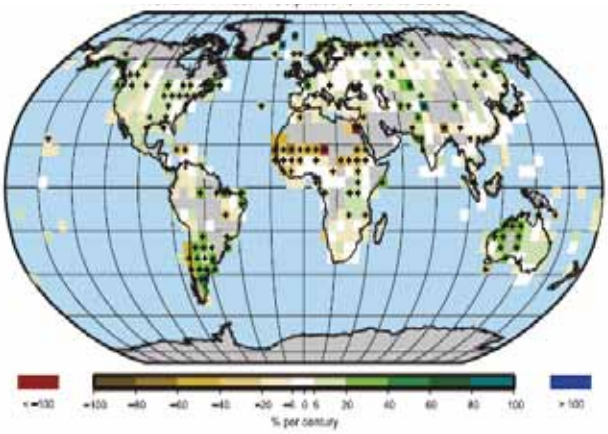

Figure 2.
Spatial Distribution of Trend in Annual mean precipitation during 1901-2005. (IPCC, AR4, 2007)

Because of increase in greenhouse gasses emission by human, earth's climate doesn't stop changing. Most of the climate models simulate the rising temperature at least 2˚K until 2100 (IPCC, AR4, 2007). Sun et al. (2007) shows the change of precipitation characteristics. They support the "Rich-get-richer" mechanism which means that the wet (dry) region may get wetter (drier). These results tell the nature environment surrounding us becomes harsher than ever.

All of us will suffer the effect of climate change, but our adaptability is not equal. Who is the most vulnerable people? One of that is the people who live in dependence on nature in dry region.

3. Local Scale Climate Change

3-1 Details of research area

Amboseli basin locates at South part of Kenya, near the border with Tanzania. The minimum average of daily temperature is 27˚C and the maximum is 33˚C. A total annual rainfall around 300mm is expected during April and May, and during November and December
(Amboseli NP, 2013). There are many kinds of animals and plants. This area is generally arid to semi-arid, thus Maasai people who are the main people there make a living by pasturage.

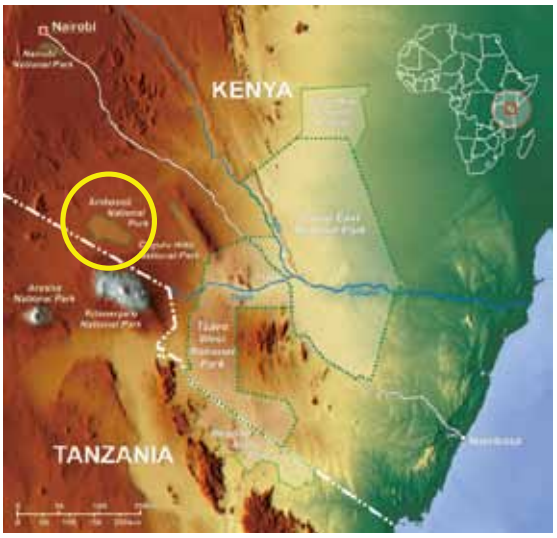

Figure 3: Location of Amboseli NP
http://upload.wikimedia.org/wikipedia/commons/4/4d/Tsavo_national_park_map_en.png

3-2 Climate Change in Amboseli

After 1960s, people began to aware the nature change around Amboseli. Dramatic loss of tree and shrub cover, the spread of halophytes, and change in population of large mammals and water birds have happened (Altman et al., 2002). People started the measurement of temperature and precipitation. Altman et al. (2002) found that the trend of maximum

temperature is 4 times larger than that of minimum temperature during last 25 years (figure 4). It indicates the daily range of temperature is increasing, and that situation is difficult to survive plants.

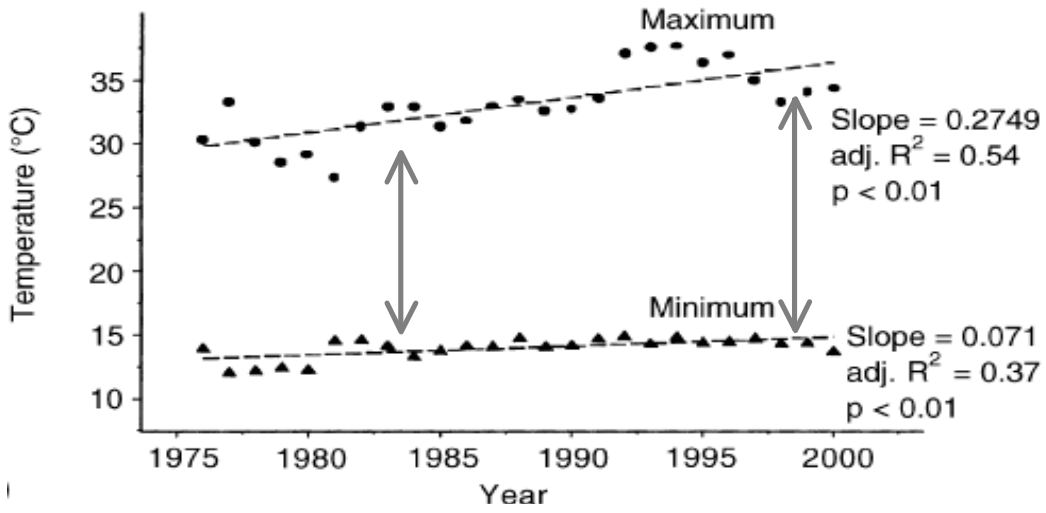

Figure 4. Trend in daily maximum and minimum temperature. (Altman et al., 2002)

Kenya Wildlife Service (KWS) measured precipitation for 35 years. We could get the data during our internship (figure 5). According to the figure 5, the little rainfall occurs each 3-4 years and it recovered next year. However in 2007-2009, little rainfall lasts 3 years and did not recover enough. It's not expected. KWS headquarter said most of animals died around the swamp at this time. They have water but they don't have enough food. This big drought effects seriously to Amboseli ecosystem (KWS, 2009).

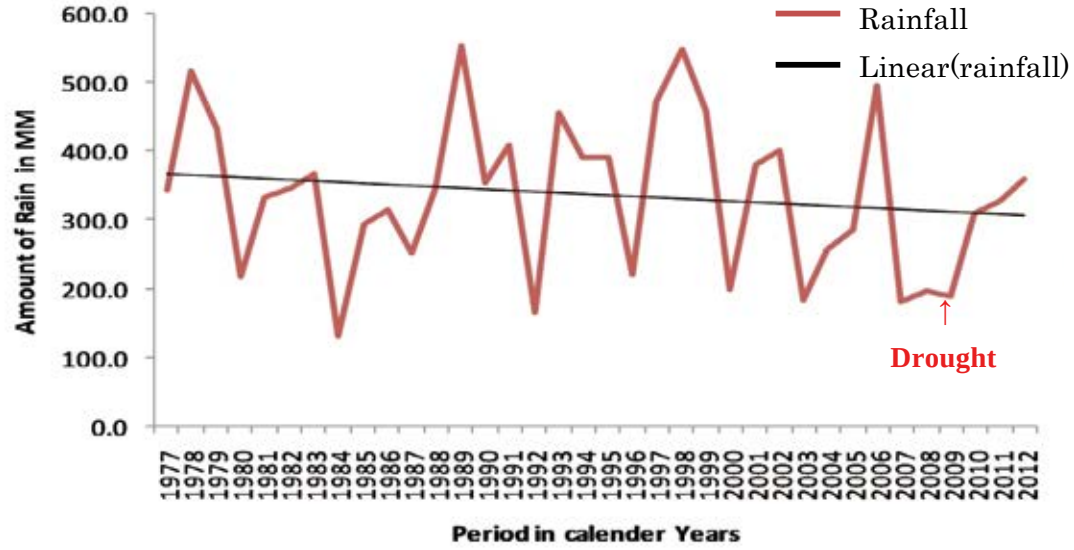

Figure 5. Rainfall in Amboseli NP (KWS, 2013).

4. Maasai's society

4-1 Social Change in Maasai villages.

Maasai people live in Southern part of Kenya, and Northern part of Tanzania (Coast and Ernestina, 2001). Some of them are included in Amboseli ecosystem (Figure 6). They maintain unique social system and culture to adapt variation of nature resources. Most of them live as pastoralist. Social and natural environment surrounding Maasai people have been changing in recent years. People get more information and high communication ability with other people including tourists. Some communities get money from tourist business. Most of them live near the tourist lodge, and only little boys and girls go camps. Buying livestock and foods is the main use of money. During drought, they mainly depend on the foods from outside.

4-2 Maasai's adaptability

K.A. Galvin et al., (2004) have examined Maasai's adaptability for drought. Adaptability is defined as adjustments in social or economic systems to adapt the expected climate effects. They've used a pastoralist socio-economic model, PHEWS (Pastoral Household and Economic Welfare Simulator) which tracks the flow of cash and dietary energy in poor pastoralist households using a simple set of rules. Figure 7 shows the average monthly percentage of the diet coming from supplements in poor households for the two scenarios, compared with the control scenario. If we give the 2 year drought in the model, the value recovers about 4 years later. This research cleared the Maasai's society is quite resilient for this kind of drought. However, this research does not include the scenario that droughts occur frequently.

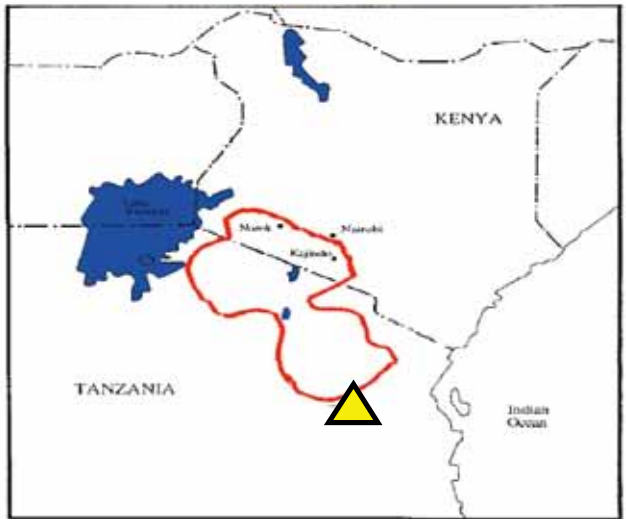

Figure 6. Spatial distribution of Maasai people
(Coast and Ernestina, 2001)

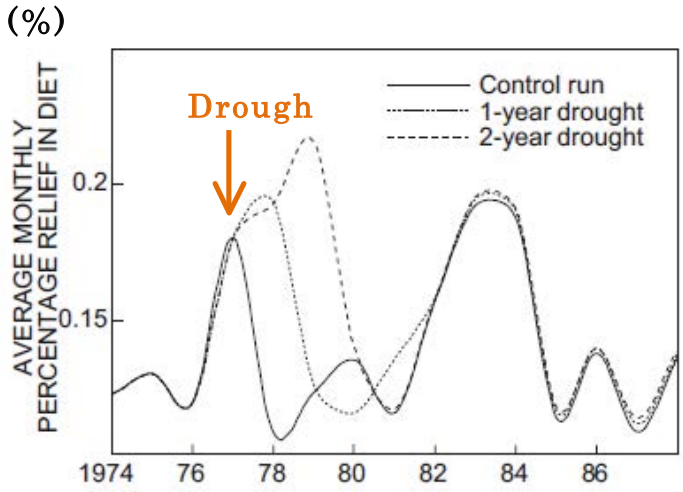

Figure 7. The average monthly percentage of dietary calories from supplements in poor households over 15 years for three scenarios. (K.A. Galvin et al., 2004)

4-3 Interview to Maasai

Follow is the real voice from the interview to the Maasai doctor, Lushana Shikoyo. 'We have settled here since 20 years ago. The water comes from the lodge, and also tourists. The drought in 2009 was so terrible and we lost almost livestock. Climate change has been happening already. We need help from outside.' He certainly realizes the changes in his society.

5. Discussion

The earth's environment has been clearly changing (IPCC, AR4, 2007). That has also happen in local region such as Amboseli basin in Kenya (Altman et al., 2002). What should we do to adapt for that? The communication with local people is the most important.

When I talk to the doctor, I wonder what he scares. He said the word of 'Climate Changes' many times, but he didn't explain the specific concern. This year is not a serious drought year. However, they said they need help. The recognize themselves that they are vulnerable society, and beg us help. The support is chronic in their society. We should form a clear view to support them. What they really need? Is that Money? The answer is very difficult.

Complex idea sometimes get them confuse. What kind of information should we provide to Maasai people? There are large differences in consciousness between the scientific field and local people's field. This is one of the serious facts in global environmental problem. At least, we should provide the information in their words, easy to understand. The background of them is so far from us.

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Chapter 5: Promotion and Challenges of Ecotourism in Greater Amboslei Region, Southern Kenya

Michael ASSEFAW

1. Introduction

Kenya is known as 'Safari Capital' of the world as its major attractions are based on safaris and national parks. Kenya's tourism sector is its second largest source of income after agriculture. The country is one of the top tourist destinations in the world. Compounded with an ideal weather, its attractions provide unique tourist experiences that include national parks, game reserves, diverse wildlife, scenic landforms and rich cultural heritages.

Tourism has been the first priority sector as a key growth driver to achieve the goals of 'Kenya-Vision 2030'. The goal of Kenya Vision 2030 is to make Kenya among the top 10 long-haul tourist destinations in the world. The vision strongly believes in environmental conservation in order to achieve its goals (preserving the environment that visitors come to see).

The vibrant biodiversity of Kenya offers the most distinctive destinations for tourists. Kenya's landscape is naturally decorated with various rock types, mountains, savanna grasslands, undulating plains and spectacular coasts. It is endowed with five internationally recognized biodiversity hotspots. Hence, the government puts ecotourism as a strategy to promote sustainable development and nature conservation and strongly recognizes the natural environment to be the domain of all sectorial development. Ecotourism as a responsible travel to natural areas is promoted in Kenya to foster tourism practices by conserving nature and improving local livelihoods. Thus, the paper focuses on the challenges of nature conservation and ecotourism and thereby clarifies the potentials of conservancies in promoting ecotourism. A field work was conducted in Greater Amboseli region in late August and September, 2013.

2. Tourism in Kenya

Tourism has a long history in Kenya and the records indicate that explorers visited the country in 1930s for big-game hunting and solitude. After independence in 1963, the government worked hard to develop tourism with greater encouragement of private sector for investment. Tourism policy of Kenya focuses on benefit sharing and sustainable development. Hence, tourism industry expanded and brought significant earnings.

According to Kenya Central Bureau of Statistics, the number of tourist arrivals increased from time to time and tourism earning grew from US $376 million in 1988 to US $448 in 1996. Likewise it continued to rise in recent years showing 62.5 billion KSh (Kenya shillings) and 97.9 billion KSh in

2009 and 2011 respectively. The number of tourist arrivals has grown by around 13.3% in 2011 recording 1,822,900 tourists as compared to 1,609,100 in 2010 (Fig. 1).

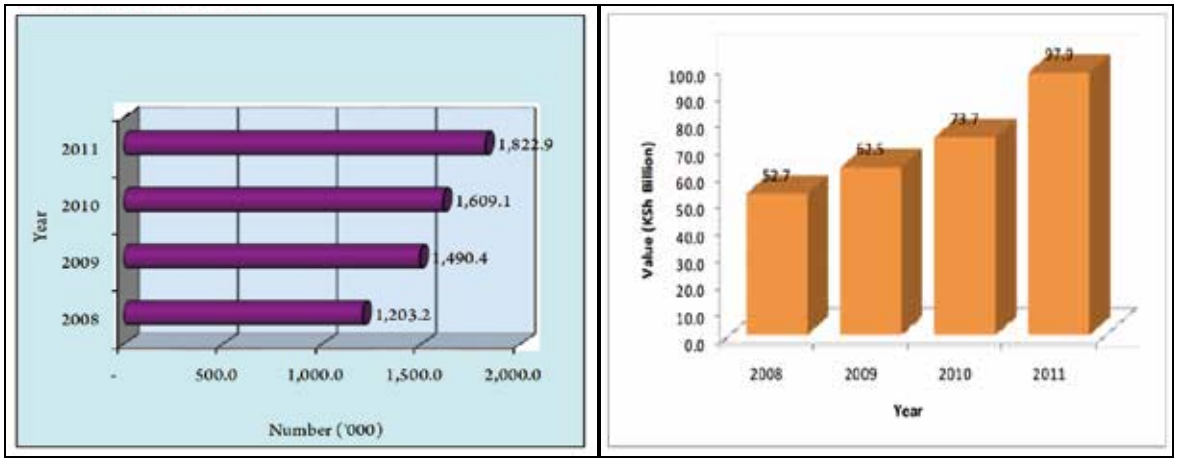

Figure 1: a) Tourist arrivals b) Tourism earning
Source: Kenya Central Bureau of Statistics

3. Ecotourism in Kenya

Ecotourism is the practice of low-impact, environmental, ecologically and culturally sensitive travel that benefits local communities and host countries (Honey, 1999). Africa has been a leading continent for the growth of ecotourism from nature-based tourism. Kenya's tourism sector heavily relies on biodiversity and 80% of tourists are primarily interested in viewing wildlife (KWS). This implies that Kenya has a greater ecotourism potential to promote nature based tourism. By promoting ecotourism, the country seems to be shifting from mass tourism to high-end low income tourism where environmental impacts of tourism are minimized by providing high class products and services.

Before 1970s, eco-adventure tours were commonly practiced based on hunting. In addition, there was displacement of Maasai people from their lands to create national parks. These resulted to ecosystem destruction and growing conflict between people and wildlife. Hence, it was necessary to bridge communities with nature conservation which is mainly expected from the practice of ecotourism.

4. Ecotoursim in Greater Amboseli Region

Amboseli is one of the five main focal areas of ecotourism in Kenya and is known as one of Kenya's 'conservation jewels'. The Amboseli ecosystem includes Amboseli National Park and six group ranches (Kimana, Mbirikani, Kuku, Chyulu, Selenkay and Olgulului) with a total area of about 5,600 km^2 (Fig. 2).

The Amboseli National Park was established in 1968 and gazethed in 1974 with an area of 392 km^2. It became a biosphere reserve under UNESCO in 1991. The Greater Amboseli region is one of the regions with increasing population in Kenya. There are around 100 communities in ecotourism based

activities. The greater chance and access to view abundant wildlife and their natural habitat and the surrounding culture of the Maasai people makes Amboslei a convenient place for ecotourism (Fig. 3).

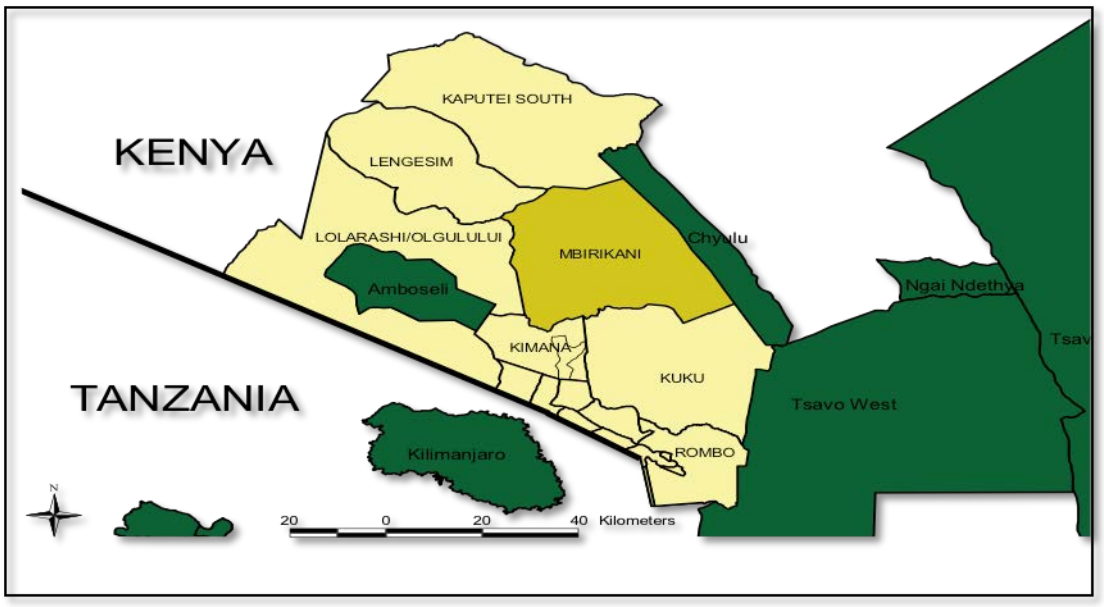

Figure 2: Amboseli Area in Southern Kenya
Source: African Wildlife Foundation

There are three lodges and one camp site inside the national park and 14 lodges outside protected area within Amboseli ecosystem. Most of these business enterprises function in close connection with communities in areas of nature conservation and rural development. Though locals are employed in the business enterprises, employment is often restricted. Most of the local people employed in the lodges are engaged in cleaning, security and labor work. According to a respondent from Emangulai village, the local people would like to get better job opportunities in ecotourism activities such as waiters and guides.

Figure 3: Amboseli National Park a) Safari cars b) Elephants backed with Mt Kilimanjaro
Photos: Michael Assefaw

For instance, Amboseli Sopa lodge is one of the lodges found in Greater Amboseli region and provides fresh drinkable water to the nearest Maasai village. The lodge created job opportunities to some locals. Moreover, tourists who stay in the lodge visit the village for cultural experience by

paying entrance fee to the village which is then shared among all Maasai villages in Amboseli area. Such income is used for social development such as building nursery schools and health support. The local people showcase their cultural way of life and manyattas to visitors. They also bring some cultural materials (souvenirs, artifacts) for sale to visitors as to promote cultural exchange in order to support the communities.

5. Ecotourism Certification

Kenya is one of the few African countries with national ecotourism certification program which is used to determine businesses that practice ecotourism [3]. The certification program started in 2002 by the ecotourism society of Kenya and comprises three levels, that is, bronze level (entry level), silver level (intermediary level) and gold level (highest level)(Table 1). It focuses on environmental management and conservation, responsible resource use and socio-economic investment. The certification is given based on environmental and social criterias by Ecotourism Society Kenya (ESOK).

Ecotourism certification has a lot of benefits especially in terms of improving resource use and reducing negative environmental impact, preservation of communities and culture, business sustainability and improving company profile. In Greater Amboseli region, out of the total 18 ecotourism service providers, only 8 are certified (Table 1). This is due to negligence of the lodges and lack of awareness on the benefits of certification. I stayed in Amboseli Sopa lodge during the field work and interviewed a staff from the lodge and was informed about the continuous efforts of the lodge to upgrade its level to silver and gold levels. Sopa lodge currently hold bronze level.

Facility name	Certification	Category
Porini Amboseli Camp	Gold	Semi-Permanent Tented Camp
Campi ya Kanzi	Gold	Permanent Tented Camp
Amboseli Serena Safari Lodge	Silver	Lodge
Tawi Lodge	Silver	Lodge
Tortilis Camp	Silver	Permanent Tented Camp
Amboseli Sopa Lodge	Bronze	Lodge
Ol Tukai Lodge	Bronze	Lodge
Satao Elerai Camp	Bronze	Camp

Table 1: Ecotourism certified facilities

Source: Ecotourism Kenya

6. Challenges of Ecotourism and Nature Conservation in Amboseli Area

As its definition indicates, a visit is considered an ecotourism when it combines nature conservation and community development with minimum impacts on environment. Due to its extensive savanna grasslands and geo-hydrological location near Mt Kilimanjaro, Amboseli area is facing problems of fast population growth leading to uncoordinated and unplanned land-use changes. According to David Western (Amboseli Conservation Program), extensive changes in vegetation have taken place in and

around Amboseli National Park over the last half century. Human induced environmental problems added to natural hazards like drought, endanger the sustainability of the ecosystem, and hence hinder ecotourism activities. The main challenges of ecotourism in Amboseli area are given below.

6-1 Land-use Change and Land Fragmentation

Amboseli is among the unique places where humans, livestock and wildlife have co-existed for long period of time. Recently, there have been changes in land-use system from communal rangelands to private pieces of land among the Maasai people. Since the 1970s crop farming has developed within swamps and on the lower slopes of Mt Kilimanjaro (Campbell etal., 2000). The Kimana Group Ranch, for instance, is very important as for conservation because it shares border with Amboseli National Park. And Amboseli National Park cannot support large number of wildlife in its limited area (392 km^2). However, large part of Kimana has been subdivided to local people where a parcel of 60 acres is allotted to each household. Thus, irrigation farming has been expanding in that area. Such land-use change is leading to habitat fragmentation and blocking the movement of both wildlife and livestock and results to human-wildlife conflicts. This collectively lowers the status and quality of natural environment in this area.

6-2 Population Growth and Agricultural Expansion

Uncontrolled growth of human population is one the main causes of environmental degradation and ecological imbalance. The Amboseli ecosystem is suffering from an ever-increasing population and expanding settlements (Fig. 4). Traditionally, the Maasai people are pastoralists and used to move from place to place in the semi-arid savanna environment. The Maasai land shrinked due to population increase in Kenya. As a result, the Maasai people started to settle and some of them shifted to farming. According to KWS, the population density of Amboseli area was less than 10 people per square kilometer before 1960s during which space was not an issue of concern and wildlife roamed freely.

However, population density rose to 11 to 30 people per square kilometer in the year 2000 due to agricultural expansion and cultivation along the natural wetlands. Then again, it is predicted that the figure will rise to about 100 people per square kilometer by the year 2040 which will result to an island national park, loss of biodiversity, increased conflicts and economic loss primarily ecotourism.

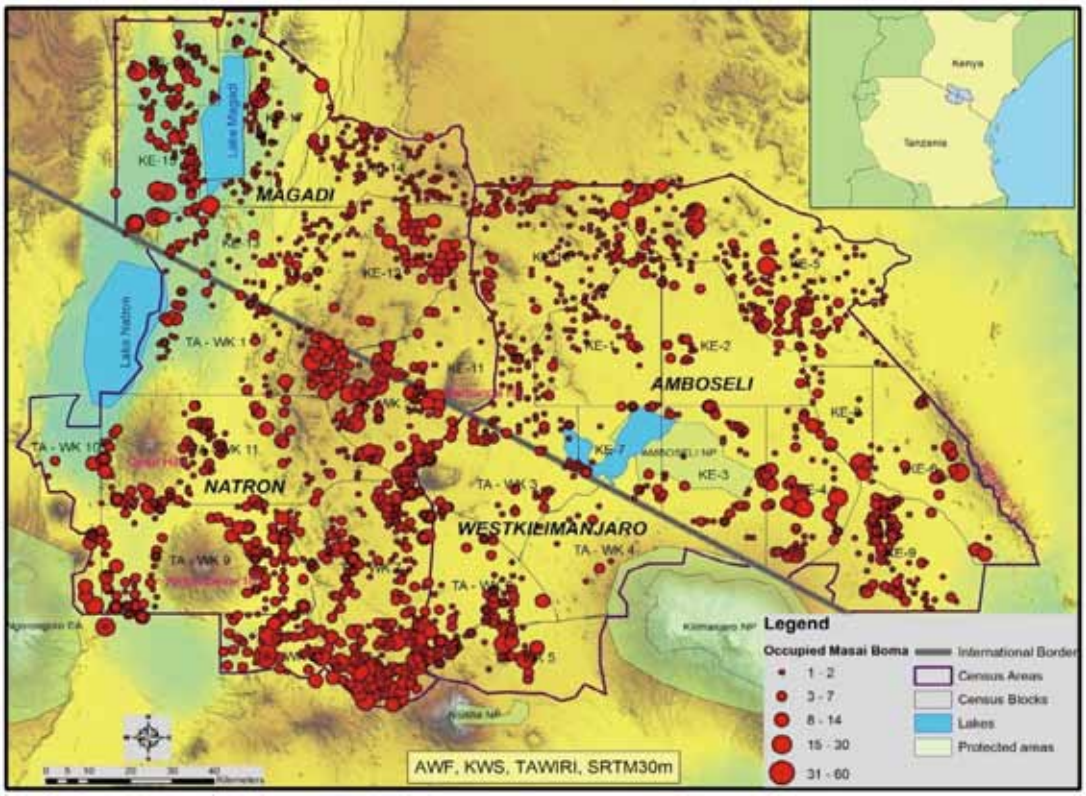

Figure 4: Human settlemet in Amboseli area and its surroundings
Source: KWS

6-3 Human-wildlife Conflict

Globally speaking, human-wildlife conflict has been a serious issue of concern among local communities living near wildlife. Conservationists and other concerned stakeholders have also been concerned about minimizing the conflict. The most compelling explanation for mounting conflict between people and wildlife is the growth of human populations (Yaeger and Miller 1986). The growth of human population in Kenya has risen nearly fivefold since the establishment of National Parks in 1974 (David W. and John W.).

Human-wildlife conflicts are observed in different corners of Amboseli area. For example, there is continuous conflict in Kimana and Northern part of Kuku because these areas connect Amboseli National Park with Tsavo West and Tsavo East National Parks where the wildlife seem to move from and to. The problem has been worsening from time to time due to blockage of wildlife corridors by human development and land privatization. A number of cases have been reported on livestock predation, crop raiding and counter retaliations (Fig. 5). For instance, killing of lions in the Kuku Group Ranch was discovered to occur due to Maasai tradition of becoming a ‘hero’ if someone kills a lion. And in other cases, retaliatory killing was a common phenomenon. So, once the natural environment, both biotic and abiotic is under threat, tourism sector in general and ecotourism in particular is negatively affected.

In order to tackle the problem in Kuku, a conservation trust in cooperation with an ecotourism enterprise is working on generating income from tourists while simultaneously promoting nature conservation through different strategies. In addition to human-wildlife conflicts, other threats to wildlife include ignorance and misconception especially on hyenas and owls, poaching for illegal off-takes, irresponsible tourism and climate change

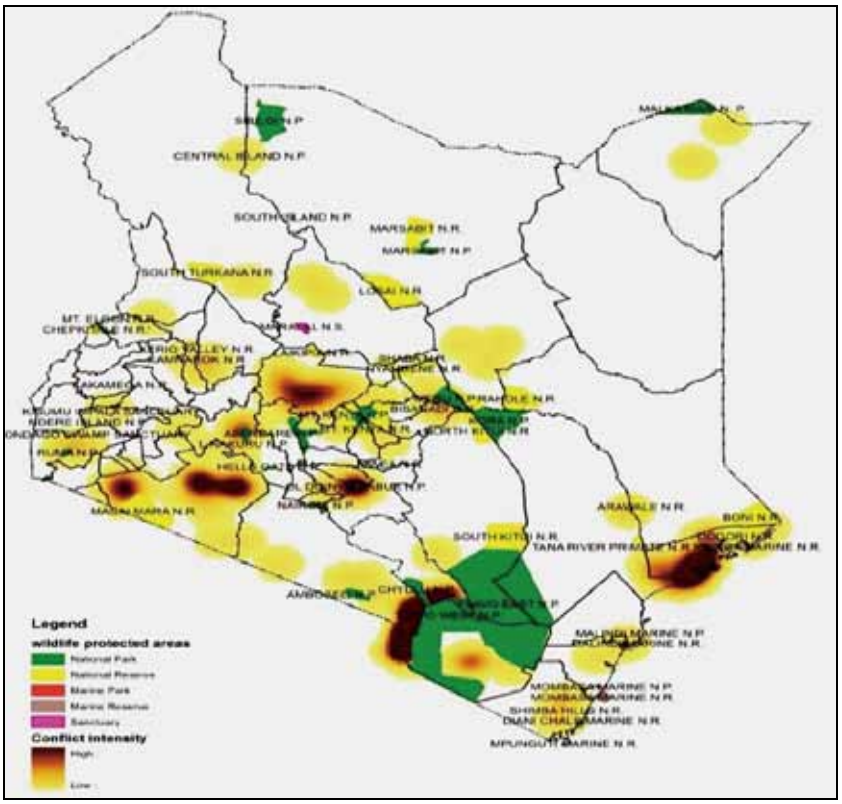

Figure 5: Human-wildlife conflict spot areas in Kenya
Source: KWS

7. Ecotourism and Conservancies as a means to achieve Nature Conservation

The above stated problems that are threatening Amboseli ecosystem need a sustainable solution. Ecotourism activities coupled with conservancies have been initiated by Kenya Wildlife Service (KWS) with active participation of communities, donor organizations, conservationists and private investors.

Conservancies are communal lands which are dedicated for conservation of wild animals and rangelands. The land ownership system of Kenya includes three systems, that is, public land, communal land and private land. In 1960, a number of group ranches were formed which reduced the movement of Maasai livestock into smaller regions (Graham, 1989). The group ranches are commonly owned. KWS researcher at Amboseli said that the land use changes in the neighboring group ranches are incompatible with conservation when they turn to private land ownership and used

for agriculture and/or settlement. That is why KWS puts a lot of efforts to ensure the connectivity of protected areas of wildlife via establishment of conservancies. The group ranches have been transformed from communal ownership to private ownership in Amboseli area. However, few group ranches got chance to be transformed into a conservancy, a land prevented from land-use change and devoted for conservation (Fig. 6). The KWS pays a lot of efforts to encourage communities for establishment of conservancies (Fig. 7).

For a conservancy to be established, the first action is taken by KWS to identify potential and prominent places of conservation in key areas. Based on Act Cap 376, Section 3A(i), KWS has the right and commitment to advise the government and communities with regards to conservation and management of wildlife [8]. Feasibility study report is conducted by KWS and the potential conservancy area is defined. Once the potential wildlife migratory corridors are spotted, KWS starts to contact and advice community leaders of a group ranch as per the importance of conservancy both for the community and wildlife. When the community leaders accept the idea, the next challenging step follows i.e. convincing the community members. The leaders need to win the support of all community members which has been very difficult among several group ranches though few succeeded to do so. If the community agrees to offer the group ranch for conservancy formation, KWS provides advisory and technical support to the community with regard to searching aid agencies and preparation of management plan. The communities then, contact funding agencies that are interested in conservation by leasing land and establishing ecotourism enterprises and hence promote wildlife conservation.

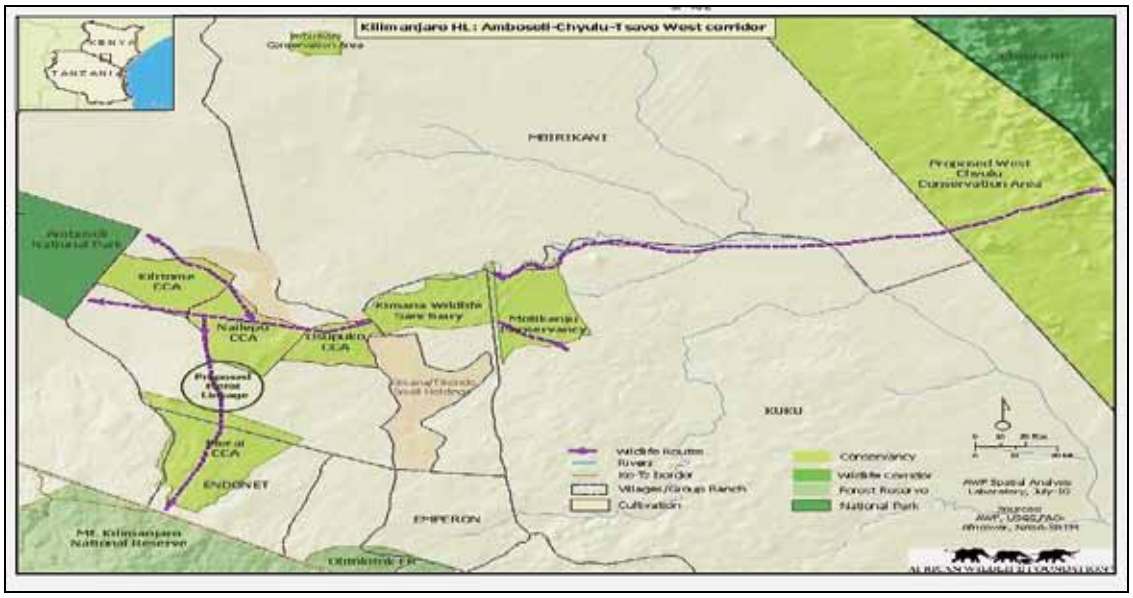

Figure 6: Conservancies for wild life corridor
Source: Africa wildlife foundation

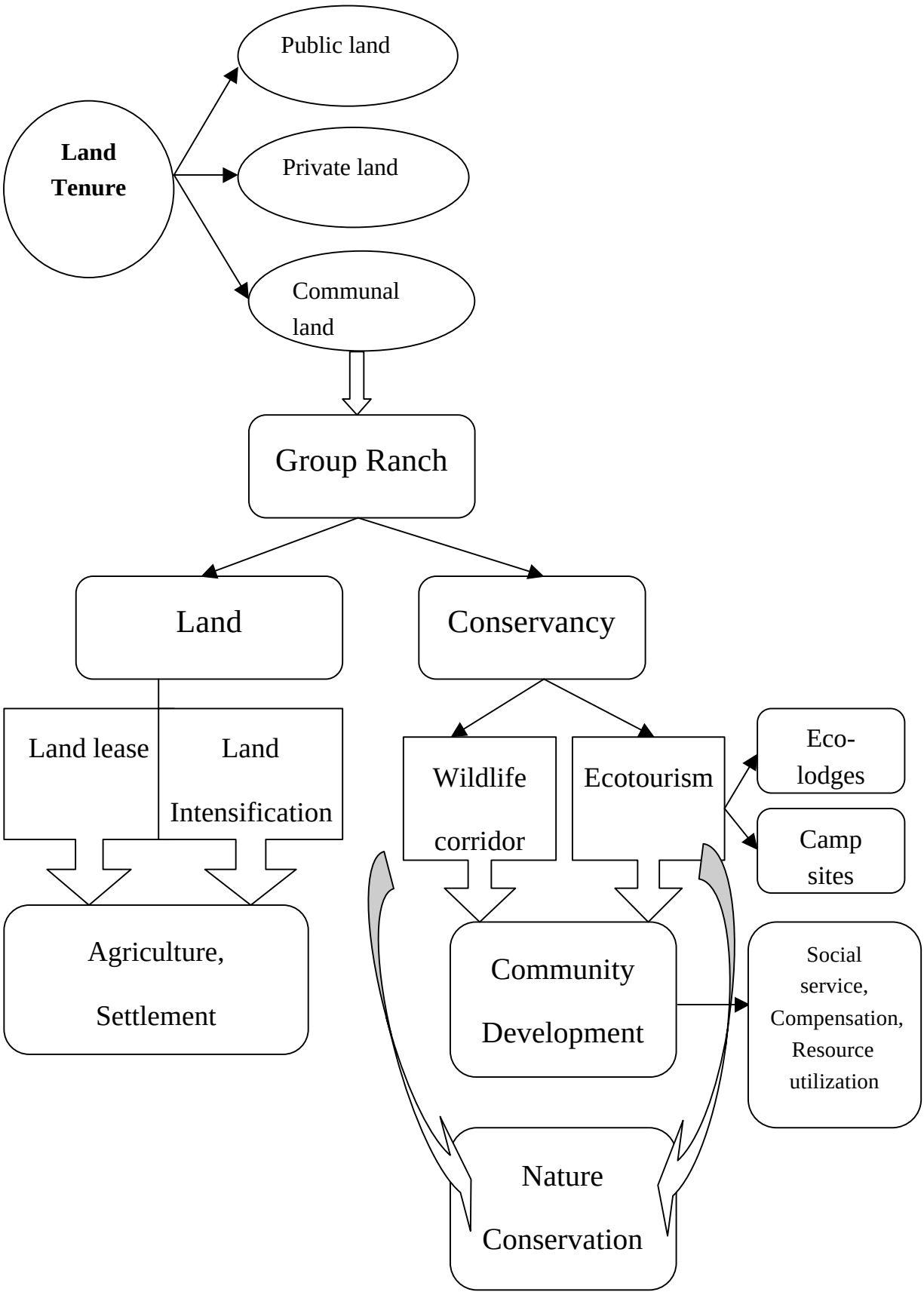

Figure 6: Framework of land-tenure system and Conservancy in Amboseli

A number of aid organizations show interest in conservation and sign an agreement with the community on the basis of defined terms of use and utilization rights. After securing aid, the community submits its management and sustainability plan to the department of licensing conservancies in KWS for approval and official establishment of conservancy.

So far, there are five conservancies in Amboseli namely Kittiro, Kitenden, Kimana, Selenkay and Kuku. The first two are very important as they share border with Amboseli National Park and serve as an important wildlife dispersal areas and corridors. Moreover, five new conservancies are in the process of formation and KWS along with other organizations are working for a successful establishment as a strategy to conserve and sustain the fragile Amboseli ecosystem. It has been witnessed that conservancies in Amboseli are playing great role as breeding grounds and habitats for endemic species.

Those conservancies that share border with Amboseli National Park become buffer zones for the protected area. According to KWS office in Amboseli, conservancies play an important role in terms of free movement of wildlife. In most conservancies the aiding organizations plant an ecotourism enterprise mostly an eco-lodge as a source of income which is used to support communities in health, education, drinkable water and other services. For further clarification, let's see a conservancy and an eco-lodge in Amboseli area.

Selenkay Conservancy

Selenkay Conservancy, located around 16km North of Amboseli National Park, is a bushy open savanna with plenty of wildlife. It has a total population of around 10,000 Maasai people. Jake Grieves, one of the founders of Kenya's ecosystem movement and a former chairman of the ecotourism society applied the low impact approach of ecotourism in Selenkay in early 1990s in order to rehabilitate the continuously impoverished environment (East African Wildlife Society). Then Jake established Porini Ecotourism Safari camp which later in 1997 gave a way to an agreement with the Selenkay Group Ranch for the establishment of Selenkay conservancy at 7,000 hectare area. The area was left for wildlife and no human settlements were allowed. The community agreed to avoid cattle grazing in the area except during extreme dry seasons with controlled grazing around the fringes.

The Porini ecotourism camp hosts a maximum of 18 tourists at a time. It has a gold level ecotourism certification. Tourists are charged US $120 per night per single person on full board. Game drives, Maasai village visits and game walks with Maasai hosts are commonly served activities. The camp is responsible for the cost of running the conservancy. The community receives a rent for lease of the conservancy area and an entry fee from each tourist. Currently, the camp employs 43 Maasai as game rangers, trackers, guides and camp staff. The share that goes to the community is used for community development such as education, health, water projects and road development. All necessary environmental care is taken within the camp and the conservancy. For instance, all garbage generated

in the camp is taken to Nairobi for proper waste processing. As a result of the conservancy, vegetation has been recovering and wild animals are returning. Consequently, Selenkay conservancy remains to be a model of ecotourism geared towards wildlife and its habitat conservation, community development and upholding the Maasai culture in Amboseli area.

Campi ya Kanzi Eco-lodge

Camp ya Kanzi is a community eco-lodge located in the Kuku Group Ranch between Amboseli National Park and Tsavo West in Southern Kenya. It was founded in 1996 by an Italian family and it's the only lodge in Kuku. It extends from Chyulu hills to the foothills of Mt Kilimanjaro, the highest in Africa. With its commitment to environmental conservation and community development, the lodge is the first Gold rated by Ecotourism Kenya. Due to its critical position within the Amboseli-Tsavo ecosystem, the Kuku Group Ranch holds greater significance for conservation. The eco-lodge offers a high-class accommodation and charges US $900 per night single occupancy (US $750 for double occupancy) plus conservation fee of US $100 per person per day (Fig. 7 a).

In order to implement its conservation goals, the owner of the lodge established a trust known as Maasai Wilderness Conservation Trust. The trust is primarily involved in biodiversity conservation with greater involvement of local people. It is engaged on wildlife conservation programs, mitigating environmental threats, controlling population growth and habitat conversion by promoting different programs and research. The trust is fully funded by the Campi ya Kanzi lodge and offers employment to local people to realize its programs. As a matter of fact, there are 63 locals employed as rangers to prevent poaching and 14 warriors to prevent lion killing and monitor lion population. The trust runs compensation schemes for those who lost livestock due to predation and promotes lion conservation awareness through different techniques such as Maasai Olympics. The community has also been benefiting in terms of education and health services. A school has been constructed and is run by the trust (Fig. 7 b).

Figure 7: a) Campi ya Kanzi Eco-lodge b) Maasai students in class
Source: a: aworlddifferent.com, b: Michael Assefaw

8. Conclusion and Recommendations

Even though Kenya's tourism greatly depends on biodiversity, ecotourism has not made significant impact on poverty reduction and community development. However, the growing number of conservancies coupled with eco-lodges and camp sites are starting to bring notable contribution on nature conservation. Therefore, an integrated and coordinated action needs to be taken to benefit both the community and achieve nature conservation. Hence, I strongly recommend for an enhanced effort on conservancy establishment and forward the following points:

- Awareness rising should be promoted among communities with regard to the benefits of conservancies.
- Increase number of conservancies especially in areas which can connect National parks and wildlife vital spots.
- Appropriate action should be taken in the issue of changes in land tenure and land privatization as it's a threat to ecotourism and consequently to nature conservation.
- All lodges and camp sites should be encouraged for ecotourism certification.
- A clear Ecotourism venture/scheme has to be developed and implemented.
- Ecotourism certification should be allied with internationally acceptable standards.
- Communities should be sensitized and empowered.
- Effective community leadership and benefit sharing should be promoted.

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Chapter 6: Wildlife Conservation Activities in Amboseli National Park

PHAM Thi Thanh

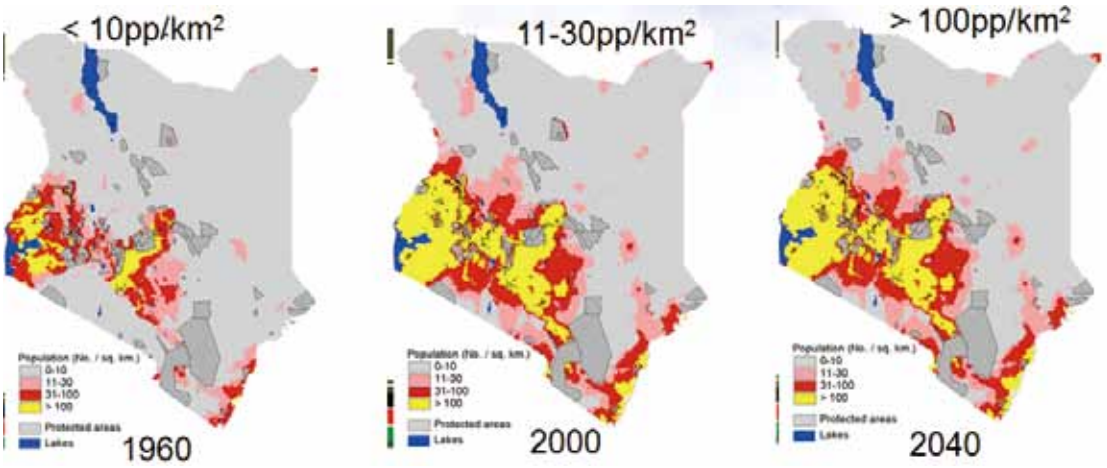
1. Introduction

Amboseli National Park (ANP) area in Kenya represents Kenya's rich biodiversity and beautiful nature due to specific characteristic. ANP is central of water resources, in which ecosystem area covers 8,900 Km² from Kenya/Tanzania border, Tsavo West National Park, Chyulu Hills, Namanga to Sultan hamud township with swamp. ANP is also home to wildlife animal with many different species including the African elephant, buffalo, impala, lion, chitath, hyena, giraffe, rebra and widebeesst among other African animals. Besides, it is also a host of Kenyan birds with over 400 species in both large and small. From all above key points, in order to protect nature, coexist with it, and hand it over to the next conservation, interfere of human plays an important role in integrated process among research activities, cooperative of local community, interest groups (NGOs). These activities are conducted with target to achieve the balance between conservation and sustainable use of natural resources. Therefore, in 1973, Kenya government developed community based conservation with many approaches, including environmental education, subvention, and tourism development, protected areas to protect wildlife and bring benefit for local people. Besides, they implemented to cooperate with international donors, central and local government. After that ANP is established in 1974 with 392km^2 and placed around Amboseli swamp with the aim of providing vital water resources for wildlife, livestock and local people. However, it remains a lot of conflicts and challenges between wildlife and human in conservation activities

2. Conflicts and challenges

After established ANP, conflicts and challenges has increased significantly because many reasons. According to (Western & Nightingale) 65%-75% wildlife that resides out parks and these second cattles of Masaai people has become government cattle. Besides, Wildlife animal including Elephants, buffalors, and other carnivores such as Lions, hyenas, cheetahs, and leopards moved freely out of park to Masaai lands. Accordingly, they damaged farm plots, spreaded diseases to livestock, killed cattle

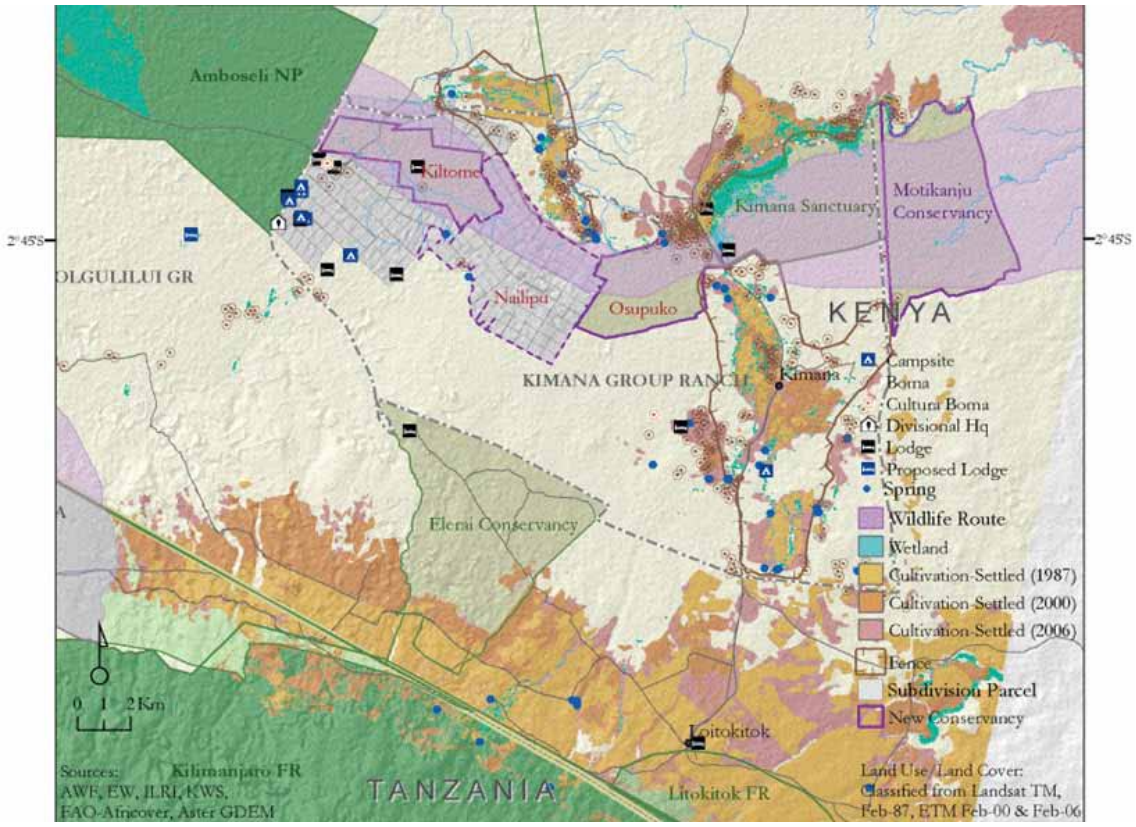
and people. These lead to conflicts has increased between Masaai people with Wildlife and government due to dislocation of human and wildlife interaction, and due to culture. Hence, Masaai people had to kill wildlife to protect their cattles. In addition, wildlife still faces many challenges due to rapid population growth. According to AWF, human population has increased significantly (figure 1)



Source: (Stephen, 2013)

Figure 1: Human population in 1960, 2000 and 2040

Figure 1 show human population in 1960 was 10 people per km^2, in 2000 was 11-30 people per km^2 and this number is predicted to increase greater 100 people per km^2 (Stephen, 2013). Therefore, land subdivision, land fragmentation will be continuing increased. Accordingly, pastoral area mobility will loss as well as ecological degradation will occur due to land use change for many different purposes (figure 2).



Source: (Lenaiyasa, 2012)

Figure 2: Land use change in Kimana group in 1987, 2000, 2006

Figure 2 show land use change has increased significantly with social frastructure , including lodges, campsites and cultivation settle from 1987-2006. These changes have put high pressure on sustainable use and land management in the context of impact of climate change.

3. Wildlife conservation

From such situations, multi-stakeholder has involved to protect wildlife including Kenya government, Kenya Wildlife Service (KWS), local people, and international NGOs and local NGOs.

Government

Government plays a key role in protecting Wildlife in Amboseli National Park. Kenya government rectifies the perceive as enforced settlement, improved husbandry practice as well as applied modern management technique for local people. They also have strategies to ensure the rights and

responsibility for Masaai people including: Diversify opportunities on the land and solve conflict about land use, improve the monitoring of local environment condition. Besides, they have incentive policy to call for international investment. All of above government strategies play critical role in supporting for other organization as KWS, NGOs, and Community.

KWS

Kenya Wildlife service is established in 1990, and is an office that keeps an important role in protecting wildlife for the whole Kenya. KWS manage 8% of total landmass including 22 National Parks, 28National Reserves, 5 National Sanctuaries, 4 Marine National Parks, 6 Marine National Reserves, and 125 field stations outside PAs. KWS operate with main targets as below

- Prevent poaching, illegal ivory trading
- Educate wildlife conservation
- Implement and cooperate research activities
- Carry out and cooperate international protocols, conventions and regulation

Until now, they are applying high technology in protecting and evaluating monitoring status and trend. They use aircraft, camera, GPS in tracking elephant movement and in providing conflict areas by using satellite image. However, the cost for it is very expensive. In addition, they are continuing to build funds and share benefit for local community as making compensation for pastoralist when elephants, buffalos, lions... damage crop and kill cattle. Besides, KWS also control invasive species and plant 7 different kinds of tree to increase biomass for Amboseli National Park. Although, they have achieved some results but it remains big challenges in term of land use change and impact of climate change.

Masaai community

Masaai community contribute their huge support in protecting Wildlife in many different ways. They protect by for leasing land, by this way wildlife have more secure land in the context of rapid population and subdivision. They also are educated by different organizations to raise awareness. These organizations use different ways as showing video about poaching ivory, killing lions…. They

now participate in monitoring wildlife and become rangers. Moreover, they participate in eco-tourism by diversifying wildlife services as guiding, singing, introducing cultural villages to derive revenue. Although, it still remains conflict between local people and GOV, NGOs.

NGOs and other conservation organizations

NGOs and other conservation organizations can be seen as interest groups, they participate in wildlife conservation with main activities:

- Focus on wildlife research, conservation
- Educate to raise awareness
- Help communities to build the capacity to engage in enterprises and undertake their wildlife
- Make compensation for local people
- Share benefits from enterprise loges to build schools, health cares…
- Provide assistance and relief: mission service, donor agencies

Although multi stakeholders involve protetcting wildlife animal and biodiversity here but many conflicts remain as uncompatible compensation with lossing animal number, dislocation of human and wildlife interaction due to increasing rate of human population and expandsion of land for human settlement, etc. Therefore, multi-stakeholders should continue to focus on ecology, human rights, legal instruments, responsibility of communities, respection toward nature, benefits sharing for people from biodiversity conservation, technologies, institutional mechanisms, education for young and adult's people, economical instruments, etc. Implementation of above various interventions will help to protect biodiversity here becoming effective, balancing biodiversity conservation and sustainable and maintaining nature value for future generation

In conclusion, ANP is one of important hotspot for wildlife. Although, it has received many support from government, different organization as well as local community. However, it remains many conflicts and challenges. So to protect wildlife in this area in term of rapid population, subdivion and climate change, ANP need more research activities, supports and appropriate incentive mechanism

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Chapter 7: Community-Based Wildlife Conservation in Kuku Group Ranch

VO Thi Thu

1. Introduction

1-1 Over view of community- based wildlife conservation in Kenya

Kenya is a famous country for the success of applying models community-based wildlife conservation. The history of community-based conservation in Kenya accompanies with the history of wildlife conservation in this country, which can be divided into 4 periods:

❖ The pre-colonial period (before 1990)

In this time, the wildlife and human coexist harmoniously. Norms, belief, experience and local traditional adaption plays an important role in protecting wildlife. Hunting was also seen by ethnic people for food, clothes and tools.However, the number of wildlife hunted was small, which did not affect the population status of wild animal species.

Trading of ivory and rhino horn appeared increased since the Greek ships came down the Red Sea to exchange goods, mostly between Africans, Persians and Indians (Frisk 1912:116)

❖ The colonial period (1888- 1963)

In 1897, the British called for an international agreement on ivory trading and wildlife protection in Africa.

In 1901, the first game reserve was established to protect wildlife and the rights of indigenous people. Revenue from entrance fee of White people should be used for indigenous people to improve their life. However,localpeople did not support for the game reserve because they were not allowed to hunt in the area that they depended for long time.

During the World War II (1939-1945): large number of wildlife was killed to feed troops and prisoners. After that, agriculture expanded strongly in Kenya, which consumed large scale of land and forest, thus destroyed wildlife habitat.

During a long time of neglecting wildlife, Kenya gave more concerns about the wildlife conservation, starting with the establishment of Nairobi National Park in 1946. National park has a stronger legal protection than the reserves. From the first one, other national parks continued to launch in following years.

❖ The post colonial era (1963 - 2002)

At Kenya’s independence in 1963, there were seven national parks and reserves (KWS, 1990). However, the massive killing of wildlife still existed, especially elephants in the 1970s.

At the same time, conservation initiative depending on local people was raised. Under the support of World Bank, early community conservation around Amboseliwas established, mainly in pastoral areas and applied revenue sharing based on conservation criteria.

In 1987, the Kenya Wildlife Service (KWS) was operated. This is a government organization responsible for wildlife conservation in Kenya, whose aims to conserve Kenya natural environment and wildlife for present and future generation; to use wildlife for economic development and benefit of people living in wildlife areas; to protect people and property from injury or damage caused by wildlife (KWS, 1990).

Community participation is also adopted in KWS's conservancy policy in order to " empower the person on the ground to benefit from wildlife and therefore take the initiative in conserving it" (KWS, 1990).

❖ From 1991 to 2002

This period emerges initiatives and structure for community conservation. Model of community-based conservation was applied with participation of different organization, NGOs and local people. According to KWS, until there are hundreds of community-based conservation model, of which mainly concentrate around national parks.

1-2 Programs in Community-based wildlife conservation

❖ The Revenue Sharing programe

In the program, KWS tried to use 25% of the gate fee revenue for community projects. However, local people claimed that they had never received this amount of money, bringing conflicts between local people and government (Leaky and Morell, 2001).

In some area, especially around the national park, belief in government of local people was not good. According to a research of relationship between government and local people around the Amboseli National park done by Akama, J. in 1995, 84% interviewersreported that there is a bad relationship between the national park management and the local community; 57% asserted that the park should be abolished (Akama, J, 1995).

❖ The Wildlife for Development Fund

This programme allows local people to manage areas for tourism and then they can have benefits from this tourism to support their lives as well as improve living standard and build infrastructure. However, because of lacking of marketing and managing skill, not many community enterprises could be survived without supports from NGOs.

❖ Problem animal control

KWS has tried to improve capacity to deal with problem animals who give damages to local people. More staffs, transportation, infrastructure and training are provided in KWS agencies in high conflict areas between human and wildlife. In Narok district, KWS shot 27 elephants, 3 799 buffaloes and 7 lions to protect the human life and property (KWS, 1994).

❖ Fencing

In some areas of severe conflict, KWS has erected fence to separate wildlife and human's property. KWS and partner NGOs and donors have erected over 400 km of fencing in twelve part of the country at a cost of over Ksh.70 million (KWS, 1994). However, fencing is also a controversial issue among stakeholders. Some conservationists against it because of fragmenting and creating islands of conservation areas. In other situation, the location of the fence has been very controversial due to unclear land ownership.

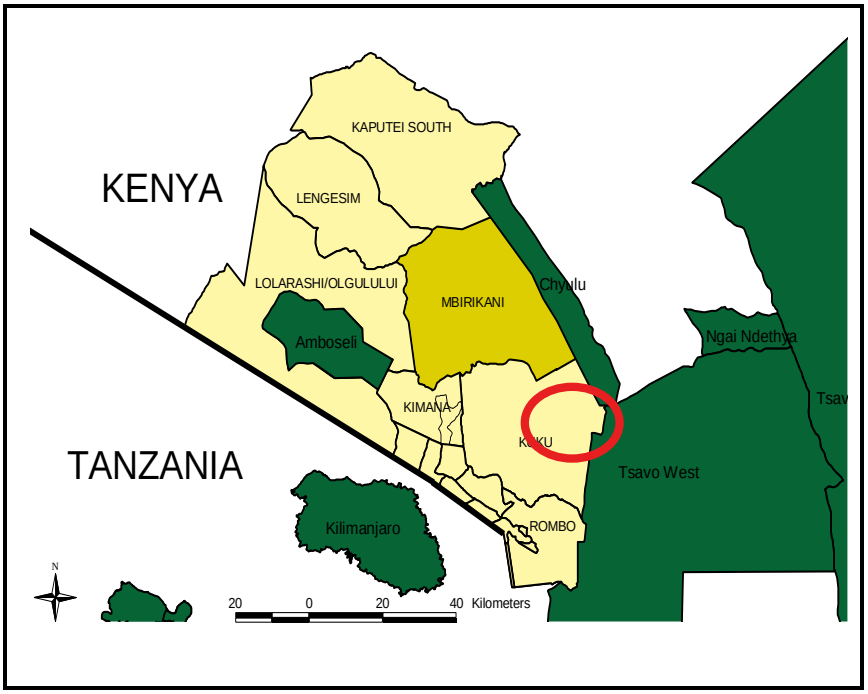
❖ Compensation

Monetary compensation is provided in cases of damages made by wildlife to crops, livestock and human injury and death. The KWS now just pay for the human death with the amount of Ksh. 30,000 (US $ 385) (KWS, 1994), which is considered to be too low for human death compensation. There has been a proposal to increase the compensation to 1 million Ksh, but it has not proceeded until now.

2. Community- based conservation in Kuku Group Ranch

2-1 Location of Kuku Group Ranch

Kuku Group Ranchislocated in the middle of Amboseli National Park and Tsavo West National Park, which has the critical role in conservation in the area. It is the important wet grazing area for herbivores and important habitat for wildlife such as elephant, lion… Kuku group Ranch also provides a corridor for wildlife transporting between the Amboseli and Tsavo West ecosystem.



Map of Kuku Group Ranch (Maasai Wilderness Conservation Trust, field trip, 2013)

2-2 Threats to wildlife conservationnot necessary to divide into different items

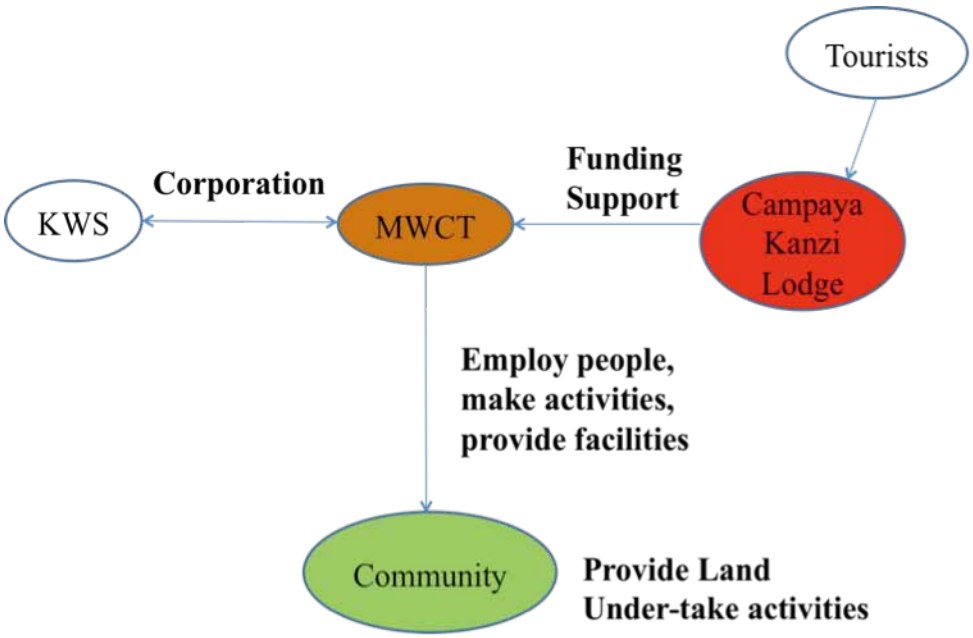
2-2.1 Population increase: Until now, there are 15,000 – 17,000 Maasai people living in the Kuku Group Ranch, which put high pressure on the area when people use land and expand their activities to the wildlife area.

2-2.2 Wildlife habitat loss: along with the population increase, agriculture and livestock has been expanded to the area, which decrease in the scale of wildlife area. Wildlife now occurs in the area that near human being such as road and agriculture area.

2-2.3 Conflict between human and wildlife increase as a result of competition of land and natural resources such as water. Wildlife comes to boma to kill livestock and destroy crops.

2-2.4 Poaching: in dry season, local people can kill wildlife for meat. This phenomenon is not common now thanks to strict conservation law, of which one kills wildlife will be brought to jail. Poaching cross the national border between Tanzania and Kenya is also a difficult problem (KWS, internship 2013).

2-3 Stake holders analysis



Stakeholders in Kuku Group Ranch conservation model

2-4 Campaya Kanzi

Campaya Kanzi is the local lodge in Kuku Group Ranch. This lodge has the ecotourism certificate to do their business. Each tourist staying at the lodge has to pay $100 for the wildlife

conservation.. This money is then transferred to the Maasai Wilderness Conservation Trust (MWCT) to manage conservation activities. Thanks to stable number of tourists, this fund is ensured through years (MWCT, internship 2013).

2-5 Maasai Wilderness Conservation Trust (MWCT)

MWCT is the local NGO that working for conservation in this area. This NGO works with the KWS and community to design activities/plans for conservation. Their activities include:

- ❖ Wildlife monitoring

They employ 63 warriors to prevent poaching. These warriors protect the areas as well as persuade Maasai people not to do poaching. They divide the area into 8 parts in order to go patrolling more effectively.

MWCT employs 14 Maasai warriors to prevent lion hunting and do lion monitoring.Lion is the target of Maasai people when their livestock loss and when they want to show their bravery.

14 Simba Scouts has been trained in GPS use and data collection, camera trap monitoring.

- ❖ Wildlife Compensation:

MWCT use funding from the lodge to compensate the loss of livestock of Maasai people. When livestock is killed by wildlife, Maasai people can report to the NGO and have a compensation based on level and reason of livestock loss.

- ❖ Wildlife awareness improvement

MWCT build school, employ teachers to improve education in the area. Books, references and wildlife conservation training is also provide

Health services also be provide when malaria test is for free for local people

2-6 Kenya Wildlife Service (KWS)

KWS in Amboseli National Park is responsible for all conservation activities in the area. Therefore, all activities made by MWCT have to get permission from the KWS. KWS also provide training for the warriors employed by MWCT to do wildlife monitoring and high technology using.

2-7 Community

Maasai people in Kuku Group Ranch play an important role in wildlife conservation.

In this area, because of impacts of human activities on environment, local people provided private land for the NGO to build conservancy. These two conservancies can help animals have large area to live without impacts of human beings.

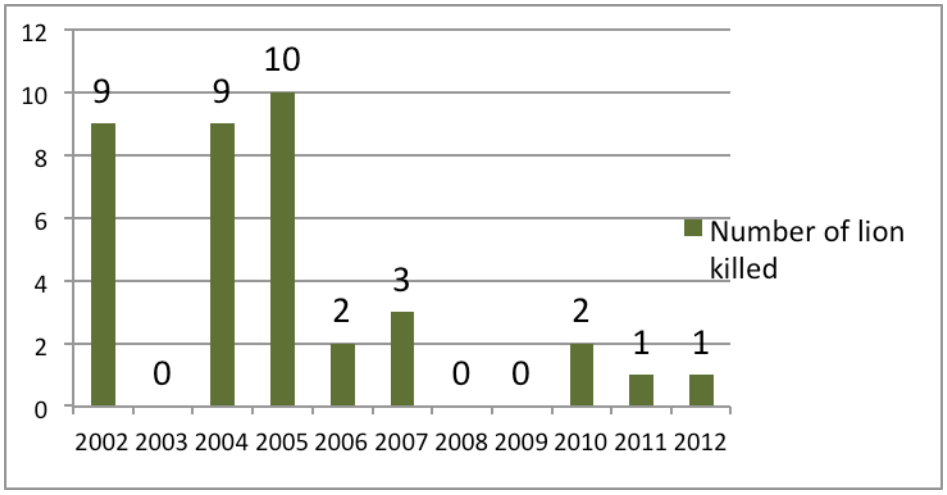
Community also directly joins in conservation activities by becoming members of scouts and poaching prevention team to protect wildlife. Warriors from community go on a patrol to prevent poaching of wildlife animals especially lions. They are divided in small group and go on a patrol in a certain time to ensure safety for wildlife. Warriors also play an important role in persuading local

people not to join in lion killing as a way to show bravery. They even have been trained in using technology to do conservation work like GIS or camera.

However, conflict between local people and wildlife still exists when wildlife come to kill livestock or destroy crops. Competition of water source also exists when livestock of local people and wildlife share the same water source. The NGO has dig some wells to provide water for wildlife. However, these wells have not enough for wildlife so that conflict because of water shortage still exists.

One reason that causes conflict between human and wildlife is because of skill of livestock caring of local people. When wildlife kills livestock of local people, they can receive compensate money. However, not every case that can receive the finance support. If livestock death not because of negligence, they can have 100 % of the value of livestock compensation. If it is because of negligence/ lost or no herder present when wildlife attacks livestock, they just receive 30% of the value. This rate is 50% if it is because of bad boma. In some cases, local people cannot understand the reason and rate of compensation. Therefore, they donot satisfy with the program and can cause harm to wildlife if livestock death still exists.

3. Result of the model



Number of lion killed in Kuku Group Ranch from 2002 to 2012(MWCT, field trip, 2013).

The bar chart clearly shown that the number of lion killed has been decreased continuously in the last 10 years. From 2007- the year of the MWCT started, there were only 3 lions killed compared to 9 or 10 lions in previous years to recently just 1 or 2 or even non lion killed each year. This can be considered as one of important element proved for effectiveness of the model community-based conservation in wildlife conservation in Kuku Group Ranch.

The Community-based wildlife conservation also brings many effective effects on community. Conflict among wildlife and human has been decreased thanks to many program of wildlife

conservation. Lions and other animals have been controlled so that they do not come to close to boma of community so that risk of killing livestock also has been decreased. Besides, wells were built to minimize competition of water among livestock and wildlife. Their livestock also be compensated when livestock are killed by wildlife so that their livelihood can be ensure. Local people also have jobs from the NGO when they become members of poaching prevention group or simba scout.

Social services also provided for community. Primary school was built and equipped facility, library and employed teachers to ensure quality of education for school children. Medical center also equipped some earlier checking for HIV and malaria medicine. Medical health check also be provided every year to local people to find out diseases early.

4. Conclusion

The community-based wildlife conservation has a long history of development in Kenya. From the first model in 1970 under the support of World Bank, there are hundreds of models recently with various programme in order to contribute to wildlife conservation as well as community improvement. Kenya's success is to provide the model into the national policy so that there has been strong legal and policy to apply the community-based conservation in practices.

Kuku Group Ranch is the good example of success of the community-based wildlife conservation in Kenya. It is clearly seen activities and cooperation among different stakeholders, which ensures the smooth applying activities in wildlife conservation and concrete result of declining number of lion killed each year

Because of lacking time, in the internship, we just have a chance to meet with the KWS- the government conservation organization and MWCT- the local NGO in the Kuku Group Ranch. Therefore, more research on effectiveness of the community-based conservation in Kuku Group Ranch should be provide, especially view point of community in the model.

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Chapter 8: Community Based Conservation in Kenya: A Case study on Karura Forest

KHONSAVANH Vilaysack

1. Introduction to Community Based Conservation.

The predecessors of community based conservation include the concept of buffer Zones, introduced by UNESCO's man and the Biosphere programme in 1979, and intergraded Conservation and Development Projects popularized in the late 1980s and early 1990s. The failures of both have been criticized to be an insufficiently involvement of local people in the planning. The main objectives of community based conservation are to enhance wildlife or biodiversity conservation and to provide incentives, normally economic, for local people (2). The main characteristic of community based conservation which is different to the other conservation movements is that it places the community's involvement at the center of conservation, rather than the mechanism. community based conservation implies the concluded as: Local level, voluntary, people centered, participatory, decentralized, village based management.

Among the stakeholders Community Based Conservation is"the overlapping roles of government and nongovernmental organizations (NGOs); and multiplex relationships of NGOs with local communities" (Austin and Eder 2007). And in Taylor-Ide and Taylor (2002) articulate this as the need for a "three-way partnership" between the community ("bottom-up"); government or authority structures ("top-down"); and NGOs, practitioners, and researchers ("outside-in") (4).

A popular community based conservation strategy is to promote tourism to existing protected areas and give profits to communities. For example community based conservation at Tortuguero National Park, Costa Rica.

2. Community based conservation in Kenya

2-1 Case study: Karura forest

2.1.1 Introduction to Karura forest

Figure 1: Karura forest map

Karura forest reserve is located in the northern part of Nairobi city, Capital city of Kenya. By the area of 1,041.3 hectares, it is one of the largest urban gazette forests in the world (3). The forest comprises of two blocks which are Karura (765.9 hectares) and Sigiria (275.4 hectares). The Reserve was originally gazette in 1932 and then in 1964 it became a Central Government Forest Reserve. The management of the forest is due to Kenya Forest Service under the Forest Act of 2005.

The boundary areas of Karura Forest reserve, since established, have been affected from 1932 to 1997 as shown in the table 1.

Year	**Proclamation / Legal Notice**	**Action**	**Area affected**	**Total area**
1932	Proc. 44/1932	Establishment of Karura Forest Reserve	1062.7 Ha	1062.7 Ha
1951	Proc. 15/1951	Excision	- 1.6 Ha	1061.1 Ha
1954	Proc. 30/1954	Addition	+1.6 Ha	1062.7 Ha
1956	L.N. 289/1956	Excision	-18.6 Ha	1044.1 Ha
1964	L.N. 174/1964	Declaration as central forest		1044.1 Ha
1986	L.N. 310/5.12.1986	Excision	- 2.78 Ha	1041.3 Ha
1993	L.N. 301/24.9.1993	Excision.>Exchange Addition>	- 5.86 Ha + 5.63 Ha	1041.1 Ha
1997*	L.N. 97/13.6.1996	Excision	- 85.00 Ha	956.2 Ha

Table 1: History of alteration of boundaries of Karura Forest Reserve

2.1.2 **Importance of Karura forest:**

According to the geographic location of the forest, it forms many part of the Nairobi river basin and it is an important water catchment area. Karura River, Ruaka River, Getathuru River and Thigiria River, these four rivers pass through Karura forest reserve. Which shown that this watershed is providing the ecosystem to the city. The forest biodiversity reservoir contents many species of plantation, besides, planted trees which are composing a large carbon sink which reduce the amount of carbon dioxide emitted by the city and then giving fresh air back to the city. Therefore, Karura forest is called as green lung of Narirobi city. Nevertheless, Karura forest reserve is providing a habitat for many fauna and avifauna species such as monkeys, squirrels, cobras, civets, duikers, etc., and 113 birds' species have been observed in the forest.

For social, karura forest is a general public space for residence to enjoy a green nature which apart from a very crowded Nairobi city. Also Karura forest contains important historical and cultural places of Kenya. Those are 50 feet waterfall, Mau Mau cave that were used by the Mau Mau during the battle for independence. Karura forest is also the place where Professor Wangari Maathai who win the Nobel Peace Prize Winner in 2004, was attacked for fighting against the developer who trying to grab the northern area of the forest. Nowadays, Karura forest is not only a common space to relax,

playing sports, picnic or holding events but also is becoming a research and education center where providing environmental and forestry education to many group of people from primary school student to scientific researchers. The forest is also providing employment opportunities to local people such as guides for ecotourism and community scouts.

For the economical benefit, Karura forest provides source forest products which are timber and non-timber products. Timber product is mainly *Brachylaensis Huillensis* or Muhugu in th local

Figure 2: The waterfall at Karura block (above)
Figure 3: Mau Mau cave (below)

word, historically has been used for wood carving and sell to the tuorists. And non-timber products are beekeeping, grass gathering, herbs and medicinal plants.

2-2 **Main threats facing the forest**.

The threats and constraints to the conservation of the forest include:

a) The forest is adjacent to slum areas. Some residents of the slums over exploit the resources of the forest. This leads to unsustainable deforestation, affecting the water table and the balance of flora and fauna;

b) Some criminals use the forest as a place of refuge and commit opportunistic attacks on visitors;

c) The lack of safety reduces the number of visitors to the forest. This, in turn, reduces interest in its preservation and conservation;

d) Due to the prime location of Karura Forest, there has been, and continues to be pressure from developers to claim forest land for building;

e) The threat posed by greedy potential developers claiming 477 Ha of the forest;
f) The forest is susceptible to forest fires during dry periods; and,

g) *Lantana camara* and other invasive weeds grow too vigorously, endangering indigenous plants and trees.

2-3 **Participatory management and conservation**

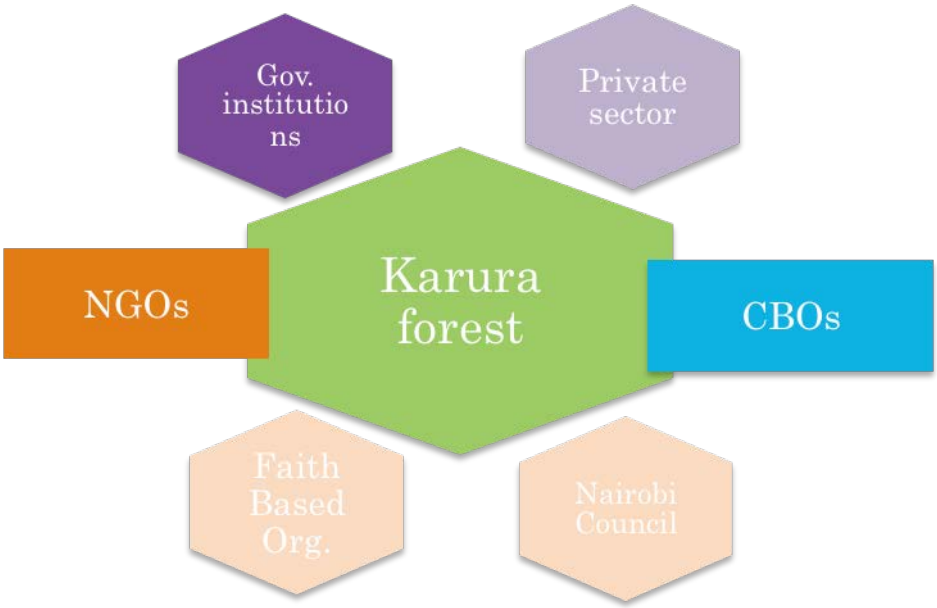
Under the Forest Act of 2005, the Karura forest management plan for five years (2009-2014) includes the specific objectives as below:

- To rehabilitate and manage Karura Forest to a healthy and productive closed canopy forest;
- To protect the forest from any high impact development other than forestry activities and ensure ecotourism proposals are in the best interest of the forest;
- To provide a world class example of sustainable participatory forest management and conservation;
- To make the forest safe and secure for the enjoyment of all;
- To support the needs of local communities;
- To promote environmental education, ecotourism and research in forestry;
- To have in place the necessary infrastructure, vehicles, machinery and equipment to sustain the management of the forest; and,
- To ensure plans are in place that provide the necessary human resources to implement and sustain the management plan.

From above programs, I have been focused on the participation of the community to the forest

management. According to the lecture from a staff of Karura Forest Environmental Education Trust, implied that the adjacent communities are participating in the afforestation such as working in nursery for example Huruma Slum, where else cleaning of natural trails. The communities are gaining the benefit by bee keeping, taking firewood (the dead branches of trees), medicine, and fodder. The program provided a job opportunity to some youths from communities as scouts, 25 scouts were selected from communities each month, and 4 tree caretakers. Both to build the capacity for the local and to conserve the forest are achieved together.

2.4 Stakeholder analysis



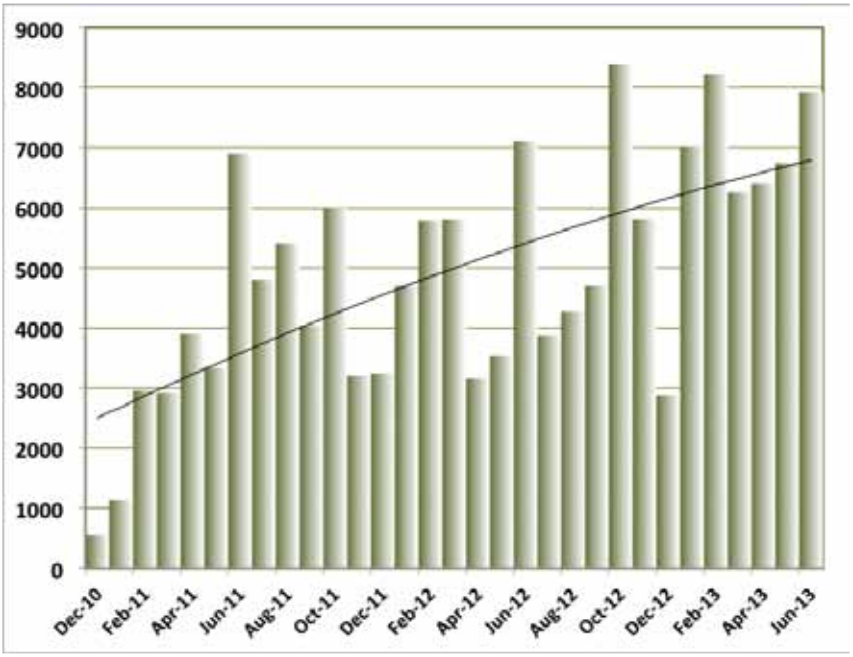
The stakeholders of Karura forest reserve are numerous and broad ranged, but they are concluded to five groups: Government institutions, Private sector, Community based organization, Nairobi council and Faith based organizations. What are those stakeholders and their roles and responsibilities? I would like to refer to the following table (table 2, Appendix III from Karuara Forest Strategic Management Plan).

Category	Stakeholder	Roles/Responsibilities
Government Institutions	MOF&W	Oversight responsibility over KFS
	KFS	Forest owners Provision of both Human and Financial resources
	Police (CID)	CID Hqs
	KEFRI	Research and wood workshop
	Tree Biotech Nursery	Biotech seedlings nursery and sales
	KWS	Wildlife in the forest
	Office of the President	City Council oversight
	Infrasound Project	Research by UON and OP
Private Sector	KPLC	Power distribution lines maintenance and extension and Afforestation
	Small business owners	Cater for the needs for the Karura community
	Resident Associations	Partnering with KFS on Forestry
	American Embassy	Afforestation
	KCB	Afforestation
	UNEP	Guidance on international forestry policy and conventions
	Naton Media	Afforestation
	I &M Bank	Afforestation
	DT Dobie	Afforestation
	Eagle Africa Insurance B	Afforestation
	City Bank	Afforestation
Faith Based Org.	Catholic church	Church
	Anglican Church	Church
	AIC	Church
	EA Pentecostal	Church
	Redeem Gospel	Church
Nairobi City Council	Karura Primary School	Primary school and staff houses
	Nairobi Water Co	Supply of water to Karura
NGOs	Green Belt Movement	Afforestation
CBOs	Friend of Karura Forest CFA	Joint management of the forest
	Huruma slum	Bee keeping, Tree planting and harvest firewood from the forest
	Mathare slum	depends on Karura Forest for fuel wood energy
	Githogoro slum	depends on Karura Forest for fuel wood energy
	Deep Sea slum	Fuel wood, depends on forest products

Table 2: stakeholder roles and responsibilities

3. Conclusion and discussion

As the green lung of Nairobi city which is main function of karura forest, Friends of Karura Forest working with Kenya Forest Service and partners are trying to convert the invasive species which cover three fourth of the forest into indigenous species, by focusing on forest re-habitation. Under the management agreement with Kenya Forest Service, and lead the Karura forest management to a good model of participatory forest management which involves many stakeholders. By enhancing a safety and security to the forest, resulted the number of visitors is increasing as in (graph 1) showing the increase of visitor monthly where almost 60% of the visitors are Kenyan and 10% are school children. The Community Based Conservation has been successfully introduced and applied to Karura forest conservation and management when communities get some benefits when participating in management.



Graph 1: Visitors to Karura by month.

In this internship program, we had a valuable opportunity to observed the really situation and discuss with many sectors who involve in the Karura forest management. After the intensive study and analysis, the two discussion points have been raised that how to encourage people who are not belonged to the Community based Association but they are in the same community to join forest management activities? And in term of sustainable management the effect of globalization and population bloom to Karura forest conservation should be concerned.

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Picture:

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Part III

Program, Daily Report, Joint Workshop, and Photos

Program of EDL Internship in Kenya 2013 (August 26-September 7)

Date		Place	Subject
Aug. 26 (Mon)		**Narita Airport**	Leave Japan
Aug. 27 (Tue)		**Nairobi city**	Arrive in Nairobi in the afternoon Detailed schedule explanation at the hotel
Aug. 28 (Wed)	Openning with University of Nairobi (Urbanization, economic development, and environmental problems of Kenya)		
	Morning	**University of Nairobi**	Openning: Introduction of Kenya Presentation 1: Overview of urbanization of Nairobi city Presentation 2: Study in Japan (by JSPS Nairobi) Presentation 3: EDL Program of University of Tsukuba
	Afternoon	**Nairobi city**	Visiting Nairobi city with students of University of Nairobi
Aug. 29 (Thu)	Global environmental issues, environmental diplomacy		
	Morning	**UNEP**	Visiting the headquarter of UNEP, lectures at EETU of UNEP
	Afternoon	**Karura Forest**	Prof. Wangari Maathai's memorial forest
Aug. 30 (Fri)	Wildlife Conservation, management, and environmental education in Kenya		
	Morning	**Lectures at KWS Hqts**	Wildlife Conservation and management in Kenya Community Wildlife Conservation
	Afternoon	**Visit Nairobi Safariwalk**	Environmental Education
Aug. 31 (Sat)	Field-trip to Amboseli, NGO's activities on wildlife conservation		
	Morning	**JSPS Nairobi Research Center**	Visiting JSPS Nairobi, travel to Amboseli NP
	Afternoon	**Local Maasai village at Amboseli**	Lifestyle, culture, and wisdom of the Maasai
Sep. 1 (Sun)	Wildlife Conservation and research In Amboseli NP		
	Morning	**Amboseli National Park Hqts**	Lectures on wildlife conservation and management in Amboseli area
	Afternoon	**Vegetation rehabilitation paddock** **Lion monitoring in NP**	Lectures on biodiversity research and monitoring
Sep. 2 (Mon)	Community based conservation		
	Kuku Group Ranch and Community Conservancy		Community based conservation Education, Water and Health for Wildlife Conservation
Sep. 3 (Tue)	Cultural diversity and ethnic issues in Kenya		
	Morning	**African Wildlife Fund Namanga office**	International NGO's activities on wildlife conservation Short safari-drive at Amboseli NP
	Afternoon	**Back to Nairobi**	
Sep. 4 (Wed)	Prepare for internship workshop		
		Hotel	Meeting and preparation for Internship workshop
Sep. 5 (Thu)	Internship workshop		
		JSPS Nairobi Research Center	Presentation and group discussion on the internship by EDL students and professors and students of University of Nairobi Participants: EDL professors and students, Professors and students of University of Nairobi, JSPS Nairobi director, staffs, KWS officers, researchers from Japan
Sep. 6 (Fri)	Morning	**Hotel**	Packing
	Afternoon	**Airport**	Leave Kenya
Sep. 7 (Sat)		**Narita Airport**	Arrive at Narita, Japan

Daily Reports

Day 1 (28th August) in Nairobi city

SHI Wansheng

Date: 2013.08.28, 9:00 am- 17:00 pm **Place: University of Nairobi and Nairobi city**

Main content:

1. To communicate with and learn from the professors and students from University of Nairobi.

2. To get some basic knowledge of Nairobi city and some related environmental problems.

Participants: (1) Professors and students from University of Nairobi,

(2) Dr. Soichiro Shiraishi, the director of JSPS Nairobi Research Station

(3) Professors and students from EDL, University of Tsukuba

Part 1: University of Nairobi

1.1. Meeting at University of Nairobi

In the morning, in the conference room of department of geography and environmental studies, we met professors and students from University of Nairobi, and the director of JSPS Nairobi Research Station, Dr. Soichiro Shiraishi. There we got some basic information about Kenya, Nairobi city and the famous University of Nairobi. It provided a good chance for us to communicate with the students who are the elites of Kenya, and also a good opportunity for them to know University of Tsukuba and our EDL program, also the education system in universities in Japan.

Fig. 1 professors and students met together

1.2. Introduction of University of Nairobi

University of Nairobi (UoN) is the largest university in Kenya, and also ranked number 1 in Kenya universities. The university has 7 colleges and schools which can be divided into 31 faculties,

schools, institutes and centers. The university has trained many famous persons, such as Nobel Peace laureate, Wangari Maathai and deputy President of Republic of Kenya William Ruto. UoN also is an international university, and it has over 200 active international links.

Fig.2 University of Nairobi

1.3. History of Nairobi city

As the professor said, Nairobi city, the capital of Kenya was founded by the British in 1899, and then be the capital in 1963, now is growing very fast to be one of the largest cities in Africa and the most populous city in East Africa, and currently is the 12th largest city in Africa. It once was colonized by Britain. During colonial period, the city became a centre for coffee, tea and sisal industry. The city lies on the Nairobi River, and has an elevation of 1795 m above sea-level. According to the 2009 Census, the estimated population was about 3 million.

Fig.3 Introduction of Nairobi city

1.4. Introduction of EDL and JSPS

In order to let the students and the professors in UoN know more about EDL program and University of Tsukuba, and also education system in Japan, Dr. Sun and Dr. Shiraishi gave two presentations, respectively. After these presentations some students felt very interested in the EDL program and studying in University of Tsukuba. During the communication, we answered some questions about how to apply for a University in Japan and the scholarship. Dr. Sun gave a detailed introduction of Tsukuba city, our university and our special EDL program and answered some questions of the students from UoN. Dr. Shiraishi gave some valuable information in his presentation

about how to apply for a university and scholarships for their further study in Japan and answered some questions from the students of UoN.

Part 2: Nairobi city visiting with students from University of Nairobi

After these presentations section in UoN, we divided into some small groups with 2 of us with 2 students from UoN. Then the students guided us and walked around the Nairobi city to experience the urban environment.

2.1. Traffic on road

We went along the small streets around UoN and the city hall, and the students gave us some information about the traffic in Nairobi city. In Nairobi, many people go to work or school by walk because of the expensive travel fee and scarcity of cheap public transport, and the main public transportation was mini buses (Matatus), then some rich people travel by private cars. In recent, the cars and other motor vehicles grew very fast in number.

Now, in Nairobi, traffic congestion usually be a problem for them commute in the city. The rapid growth of population and fast urbanization had brought explosion of motor vehicles in numbers. On the small street, we can see so many cars, and some of cars were parked at the both sides of the road left very little space for other cars to pass through. Many roads have no traffic signals, and therefore usually caused chaos at the cross. It's really difficult and dangerous for the drivers and pedestrian.

Fig. 4 Traffic in Nairobi city

2.2. Nairobi river

Our friends guided us to the Nairobi river, and it is the main river in the city. Though it is very narrow, this river is very important to the city and the name of Nairobi city was also had a close connection with this river. Unfortunately, this river had been polluted and the situation got worse in recent years because of the indiscriminate discharge of wastewater and garbage into this river from household along the river bank. Now, the government is paying special attention to dealing with the pollution and doing their effect on restoration of this river.

Fig. 5 Nairobi river in the city

After walking around, we went back to UoN to get together with other students and professors. The students from two universities started open communication with each other once more, and then left the contact information with each other. After that we shook hands and say goodbye to our friends from UoN, and then a whole day communication and visiting finished.

Day 2 Morning (29th August) at UNEP on Global environmental issues and Environmental diplomacy

KOYAMA Nika

1. UNEP Headquarter

On the third day morning of our Kenya Internship, we visit UNEP, United Nations environment programme in United Nations office Nairobi. This office was established in1996. UNEP established in 1972, as a United Nations organization and headquartered in Nairobi. UNEP acts for sustainable development of the global environment. We visit here for studying about how does an International organization think and act on environmental issues. We met officers in UNEP and took lectures.

Fig1. UNEP office in Nairobi

2. Lectures in UNEP

That day, we took 6 lectures by officers in UNEP.

1) Introduction to UNEP by Brian Waswala

UNEP established in 1972 and is the voice for the environment within the UN system. UNEP's work focuses on the following six cross cutting thematic priorities:
Climate change, Disaster and conflicts, Ecosystem management, Environmental governance, Harmful substances and hazardous waste, Resource efficiency – sustainable consumption and production. In addition, the six divisions work in collaboration to achieve an UNEP's mission: Division of Early Warning and assessment, Division of Environmental Policy Implementation, Division of Technology, Industry and Economics, Division of Regional, Division of Environmental Law and Conventions, Division of Communications and Public Information.

2) UNEP's approach to strengthening the climate resilience of ecosystem and communities by Anna Kontorov

UNEP helps developing countries to build resilience to the impacts of climate change.

UNEP supports national efforts to integrate climate change adaptation measure. For Climate change adaptation, UNEP acts three matters: Demonstrate and upscale Ecosystem Based Adaptation approaches, Facilitation a Global Adaptation Network for knowledge sharing, Supporting National access to Adaptation funding.

3) Environmental Education and Training Unit (EETU) by Mariam Osman

EETU work with/through higher education institution in support of UNEP's priority thematic areas under the Medium term strategy. Global Universities Partnership on Environment for sustainability (GUPES) is to promote the main streaming of the environment and sustainability practices and curricula into universities by supporting innovative approaches to education. This is done in accordance with the ongoing United Nations Decade of Education for Sustainable Development 2005-2014, and the outcome of the Rio+20 summit.

4) South-South Cooperation Exchange Mechanism by Shirley

South-South cooperation (SSC) is the exchange of technology, skills, resources and information between governments, organizations and individuals in the developing world. The SSC Exchange mechanism is an initiative aimed at strengthening exchange and collaboration between developing countries in the fields of environmental and sustainability development. The exchange mechanism is 3 steps: 1. Identity and write case study, 2. Review of case study by experts, 3. Disseminate of case study through the UNEP website and social media.

5) UNDP-UNEP Poverty-Environment Initiative by Charlie Avis

The Poverty-Environment Initiative (PEI) supports country level efforts to mainstream poverty environment linkages into national development plans and processes. PEI puts the environment into development planning and the poor into decision-making.

6) Science-Policy Interface at UNEP by Sunday Leonard

Science is performed by specialists. Policies are developed by politicians or civil servants without scientific backgrounds. Therefore it is important that the relationship between Science and policy for developing fit for purpose and holistic solutions to the challenges of the complex earth system. However it is difficult that exchanges information and knowledge construction. UNEP is making bridge of science- policy interface; the Global Environment outlook, UNEP foresight Process, Science based policy Reports...

3. Discussion (Answer to Question)

Lecture 2) Local people feeling about climate change definitely have changed from last six years (2007 to 2009: unusual drought). They were more careful about climate change.
UNEP needs more to go local community for giving knowledge about the climate system.
Lecture 6) Scientist should give information as simple language as possible. What was advocating is that present the true message and then in balance we provide the analysis. Scientists should always present that information in clearly.

4. Conclusion (reflection)

The lectures in UNEP showed environmental problems are complex and difficult. Environmental problems are global issues, so we should be thinking diplomacy. In addition, we should think a balance between environment and development. UNEP has tried many programs for supplementing complex problems. In fact, they have stored much success in the programs. However I think if UNEP does programs so strongly, it would be forcing of western culture to local cultures even they care about local. So the balance of support of UNEP and independence of a community is really important. Therefore, this visiting, I realized again environmental problems are super difficult and take a long time to supplement.

Reference:

- UNEP website , http://www.unep.org/ (Accessed September 29, 2013)

Day 2 Afternoon (29th August): Karura Forest, Nairobi

Michael ASSEFAW

Karura Forest, Nairobi

1. Introduction

Located to the north of the busy central parts of Nairobi is a green, naturally decorated, breathtaking and dense forest area named Karura. All noise and air impurity disappear once you reach the forest and one can realize the cool atmosphere and beauty of the natural environment. The variety of birds and their splendid sounds are eye catching. Our Kenya Internship team visited Karura forest on August 29th, 2013. Situated in the northern part of the capital city, the Karura forest is one of the largest forests located within a city anywhere in the world. It is the 'green lung' of Nairobi. The forest was gazetted in 1932 and became a Central Government forest reserve in 1964 through Legal Notice 174. It covers an area of 1041.3 hectares.

Karura forest is managed by the Kenya Forest Service (KFS) and has two blocks namely Karura (eastern part) and Sigiria (western part). These blocks are crossed by the Lamuru road (Fig 1.1). The UNEP headquarter office and ICRAF (World Forestry center) are found adjacent to the forest on its western side. There are slums that share the border with Karura, that is, Haruma slum to the North, Deep Sea slum to the West, Mathare slum to the East and Githogoro slum to the North West of the forest. With its gentle sloped topography, the forest makes up part of the Nairobi river basin.

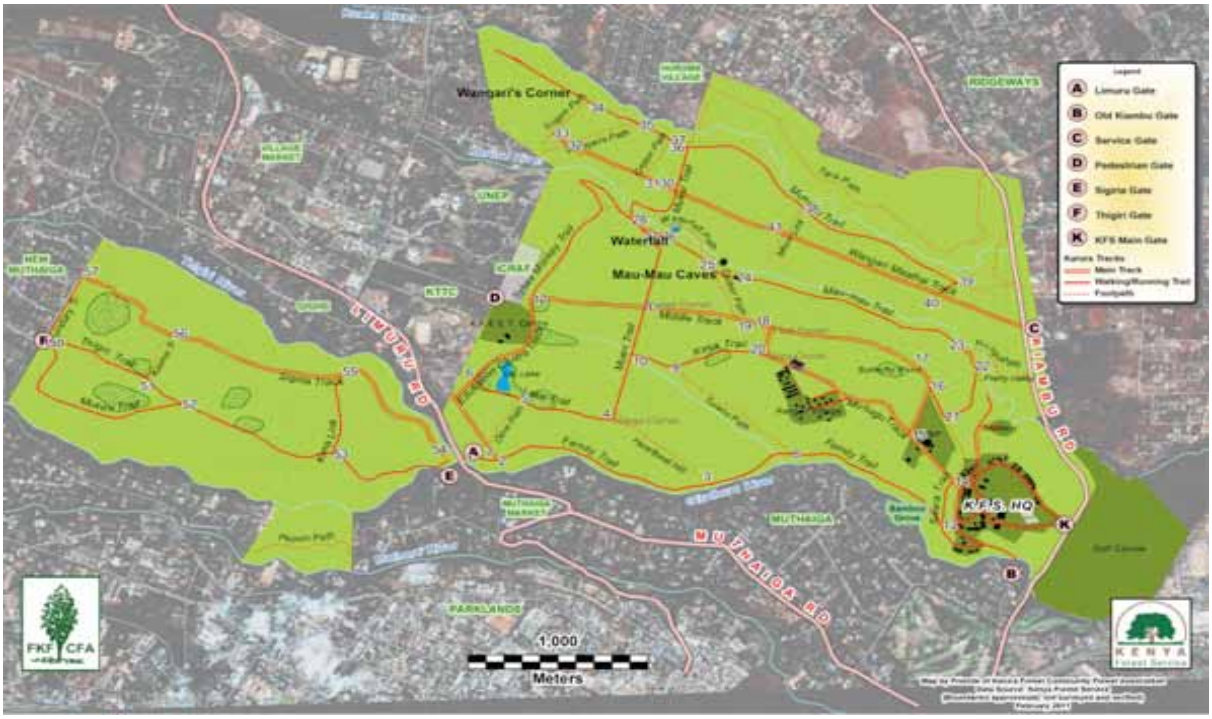

Figure 1.1: Karura Forest
Source: Friends of Karura Forest (FKF)

Before 1935, the forest was dominantly covered with local indigenous species. Currently it is composed of both natural and plantation forests and indigenous forest accounts for only 25%. Indigenous trees include Brachylaena huillensis (Muhugu), Albizia schimperiana (Mukurue), Croton megalocarpus and warburgia ugandensis (Muthiga). Eucalyptus trees stand as major plantation trees which are highly preferred by the local people for the purposes of construction and firewood. However, according to Mrs. Lucy Njoka, environmental education officer, efforts are undergoing to clear Eucalyptus and replace them with indigenous species.

Karura forest was previously a place for serious crimes including mugging and robbery. However, due to the coordinated efforts of the Kenya Forestry Service (KFS), Kenya Tourism Board and other stakeholders, the forest is now well-secured, clean and pleasant with its ever growing ecological services. According to Mr. John Chege, Chief scout, the forest is electrically fenced and 26 scouts are employed by Friends of Karura Forest (FKF) - Community Forest Association. Hence, the forest remains safe for visitors. Our team observed and enjoyed the safety, beauty and cleanliness of the forest. We visited a 50 feet waterfall, Mau caves, marshland and streams inside the forest (Fig. 3). We were able to experience the unique natural environment within a heavy urban location.

2. Wangari Muta Maathai (1940-2011)

Whenever Karura forest is mentioned, Wangari Maathai is the first to be remembered. Prof. Wangari Maathai, a Kenyan environmentalist and political activist, was the founder of the Green Belt Movement in 1977 aiming for environmental conservation, community development and capacity building. Since then, over 51 million plant seedlings have been planted under the movement.

Pic.1: Prof. Wangari Maathai
Source: www.legacy.com

Claiming land for buildings by investors has been one of the main threats to Karura forest. In 1998, Wangari Maathai led protests against land privatization and fought for the preservation of the forest. On January 8, 1999 Wangari Maathai and many Greenblet Movement supporters were attacked in Karura forest as they were marching to plant trees in areas that had been cleared for real estate development purposes. During the event, she said:

“We would focus our energy on the protection of the forest and educating Kenyans in about the same way we have educated them to plant trees. We want them to understand that it is very important to protect forests and public land.”

The protest continued until August 1999 until the president announced proscription of land privatization in the forest. Wangari Maathai also opposed land allocation from part of the forest to the National Environmental Management Authority (NEMA). In 2004, Wangari Maathai became the first African woman to receive the Nobel Peace Prize for her outstanding work with the Green Belt Movement. The late Wangari Maathai led and greatly contributed for the conservation and sustainability of Karura forest. Hence, there is Wangari Maathai corner inside the forest (Fig. 1.1).

3. Challenges, Successes and Opportunities of Karura Forest

Multiple environmental and socio-economic benefits can be achieved from sustainably managed forests. In order to achieve sustainability, there are both natural and anthropological challenges that need to be met. Karura forest is surrounded by two extremes in terms of human settlements. On one side a number of high-class communities, embassies and prominent governmental and non-governmental organizations are located whereas on the other side, a group of poor communities dwelling in unplanned houses inhabit the locality. Though continuous patrolling is done, some residents of the densely populated slums around the forest act irresponsibly and abuse resources.

Figure 3: a) Mau cave b) waterfall in Karura
Source: Photos by Michael Assefaw

Due to its location inside the capital city, there has been continuous land claims for development investments in the forest. Commitment of the government and other bodies is crucial to ensure its preservation and maintain its status as a flourishing forest. Lack of sufficient funding, labor force and adequate information are among those issues that require prioritization. The problem of dominance by invasive plant and tree species is another threat to the forest.

Given the above stated challenges, a number of successes have been registered in Karura forest which turned it to a nature trail from a battle field. The cooperation among different stakeholders including governmental organizations, non-governmental organizations, the private sector, business sector,

religious organizations and communities was crucial to the conservation of Karura forest. We noticed the harmonized participation of communities as a great achievement and this needs to be further enhanced for the sustainable utilization of resources. The employment opportunities for local people are helping to reduce poverty and strengthen livelihoods.

Moreover, the number of visitors has dramatically increased and over 96,000 people visited the forest every year, of which 60% are Kenyans and 10% are school children. This shows the growing awareness of Kenyan people for the conserving and friendly utilization of Karura forest. The establishment of the Friends of Karura Forest (FKF)-Community Forest Association in 2009 brought a tremendous contribution to the management and protection of the forest. Thus, Karura forest is now endorsed as a major tourist site in Nairobi. Karura Forest Environmental Education Trust of the forest hosts visitors and students and promotes environmental awareness. These manifest that Karura forest has great potential for ecotourism through nature based on environmental recreation and education.

References:

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Lucy Njoka, 2013, Karura Forest Environmental Education Trust, Slide presentation.

Kenya Forest Service, 2010, Formation of Karura Forest Environmental Education Trust (KFEET) Underway.

Time.com, 1998, Wangari Maathai, Hero of the Week December 28, 1998- Her women's Army Defies an Iron Regime

Day 3 (30th August):
Kenya Wildlife Service(KWS) Headquarters and Nairobi Safari Walk

LU Mengqian

Content:
1.Kenya Wildlife Service(KWS)
2.Lecture: Wildlife conservation and management in Kenya
3.Nairobi Safari Walk

1. Kenya Wildlife Service(KWS)

Since tourism is the second largest pillar industry of Kenya, the wildlife resources must be legitimately managed. Kenya Wildlife Service is a state corporation established by an Act of Parliament Cap 376, its mission is not limited in conserving and manage wildlife, it's also responsible for enforcing related laws and regulations and managing the local tourism. KWS manages 8% landmass of Kenya, including 23 terrestrial National Parks, 28 terrestrial National Reserves, 4 marine National Parks, 6marine National Reserves and 4 national sanctuaries.

The key objectives of management are:

►To enhance wildlife and visitor security.

►To minimize human wildlife conflict sand support community conservation initiatives

►To enhance the conservation education programs.

►To undertake and facilitate management oriented research.

►To enhance tourism management with a view to maximizing the existing revenue potential of the PAs

►To prepare and implement management plans for National Parks and National Reserves

►To administer and co-ordinate international protocols, conventions and treaties regarding wildlife in all aspects in consultation and collaboration with other stakeholders

2. Lecture: Wildlife conservation and management in Kenya

In the third day's morning, we visit KWS Headquarters and had a lecture about wildlife conservation (Figure 1).

We talked about the history of wildlife conservation in Kenya: Since 1963, the independent of Kenya, the government have legislated to protect wildlife from poaching. Rigorous policies have been established to conserve biological resources, after that, more than 59 national parks/nature reserves were built one after another, made Kenya one of the most popular places for enjoying the natural beauty and seeing wildlife.

We have also given an introduction of KWS's function and main management approach,which's not just limited to ecosystems and landscapes conservation, but also has some extension in veterinary and capture services and rare species conservation.

The lecture also showed some recently data of wildlife (numbers, distribution, etc) and the related

researches. Besides, the researcher introduced us a method to make our recount and report clear which impressed us a lot.

We had a hot discussion about how to monitor and achieve the protection of wildlife outside government designated protected areas when the presenter mentioned indeed the major part of them are out of the national parks and nature reserves due to migrate and other reasons.

Figure 1: KWS Headquarters (Left) /lecture about wildlife conservation

3. Nairobi Safari Walk

In the afternoon, we spent 4 hours in Nairobi Safari Walk. Nairobi Safari Walk is a large land with a combination of three simulated: forests, wetlands and Savannahs and it's beside KWS Headquarters, which means it's just 7km south of the city of Nairobi. There are many rare types of wildlife including the rare bongo, white rhino, albino zebra, a collection of cats, antelopes and primates, it also has a collection of more than 150 kinds of local trees. In the Nairobi Safari Walk, we really enjoyed the natural scenery just like we've across the whole country（Figure 2).

Figure 2: the Map and Wildlife of Nairobi Safari Walk

Reference

1.Kenya Wildlife Service: http: //www. kws. org
2.KWS, Wildlife conservation and management in Kenya, 30th August, 2013

Day 4 (31st August):
Visit local Maasai village: Lifestyle, culture and wisdom of the Maasai people

Temulun

1.Introduction

After staying in the Nairobi city center for several days, we saw a rising mega city in east Africa, it was really an unexpected experience in Africa, no one had ever imagined such a city like Africa among us. The tall buildings, nice restaurants and crowded streets, all looks great. But before we came in Africa, we all think that Africa is all about wildlife and savanna. So today we finally had a chance to go safari, go visit Maasai people and we were all very excited.

Since we cannot take all our luggage to the Amboseli national park, and the size of the Safari car, we first went to JSPS Nairobi center to save some of our luggages and then went on a long trip to our next stay-- Amboseli Sopa lodge near Amboseli national park.

2. On the road

In the early morning, we packed our things and left hotel around 9 for JSPS Nairobi center first. We shared two cars, and two kind local drivers told us a lot about Kenya. Because we were going along the road to Mombasa, which is the main port in Kenya, we saw many big trucks went by. We could imagine the Mombasa port must be very busy and lively. The driver also told us that the malaria in that area is very dangerous so better not go there. We went about 3 hours and stopped at a local shop, full of souvenir and we stayed at shop for about half an hour.

Fig. 1 Local shop

3. Maasai village

After half days long ride, we finally welcomed by our long waited friends, the Maasai people. Before we arrive kenya, we had learned some about Maasai people, but today, when we saw them in our own eyes, we were shocked by their ongoing traditional lifestyle. They dress in their unique clothes, their

traditional house, and their facial expressions are so different from others. They have a tradition of welcome dance for the new visitors, they stand in a row, singing in different tunes, jumping up and down and it was amazing! We joined them soon after watching for a few seconds.Some of them speak english very well, so after the dance, they showed us how they keep a life in this modern world.

3.1 Wisdom of Maasai

Fig. 2 Maasai doctor

The guide first introduced us to their village doctor, a tall young man who learned medicine knowledge from his father, showed us many kind of medicine (made from different tree bark), which cure headache, eye, stomach, back and knees, bites and fire burn etc. The doctor seems not only know about medicine, but also many surviving techniques. From this point of view, I think there are many such a intelligent person so that they can survive.

Fig.3 Maasai house

3.2 Lifestyle of Maasai

The house of Maasai people is also a very interesting sight. It is mainly made of wet mud, branches, dried grass, sticks and cow dung. The roof is waterproof and inside is very dark in daytime, the guide led us go into his house and showed us the house. There was a very easy kitchen made of stones, very easy bed just had a leather sheet on it. We can hardly imagine how they live in such a simple equipped house.

The Maasai people are herding for life. They herd goats, cows mainly, we saw young boys herding cows along the road, they were very happy surround by goats.

Fig.4 Maasai boys

3.3 Future generation of Maasai

There is a elementary school in the village, children under age 7 almost have classes there. They study English as well as Swahili, maybe at home they can learn Maasai language. So as they grow up, they can go for a better middle school, but the problem is, will they like to keep their traditional life as their fathers do? No doubt we saw some of maasai young men have cellphone in their hand, they also drive bikes, they are changing little by little, what will happen to them after twenty years?

I think many people are curious to know about the answer. Maybe many years later, we can go and see.

Fig.5 Child writing on the ground

Day 5 (1st September):
KWS headquarter in Amboseli National Park

Yurisa MIKI

This is the second day in Amboseli. We left the lodge at 7:00, and enjoyed morning safari at first. Amazing view of savanna continue to the horizon. Many Elephants, giraffes, zebras, gazelles, wildebeests, buffalo and some birds live together there. Most of them walked or run to drink the water of swamp. During only dry season, wildlife animals move to Amboseli basin. That's why the dry season becomes the tourist season. I cannot believe the fruitful sight expanding in front of me. We could see the most natural way of coexistence.

Figure1. Elephant family
(Picture in Amboseli NP)

Amboseli National Park is established in 1974 to protect this unique ecosystem. We visited the headquarters of Kenya Wildlife Service (KWS) who funds and organizes this park. Julius K. Cheptei who is the senior warden of the Park gave us the lecture about the biodiversity research, conservation and management of Amboseli National Park. Amboseli NP belongs to the Amboseli ecosystem which crosses the border with Tanzania. Thus, they communicate the neighbour country to conserve wildlife animals. Monitoring the number of wildlife animals by using satellite and fit GPSs to the elephants and carnivores is very important to assess their conservation work. He also explained about their educational work to the local children adult people.

Figure2. A rain gauge near the KWS headquarters
(Picture in Amboseli NP)

Figure3. Inside cup of rain gauge
(Picture in Amboseli NP)

I ask them to show the rain gauge in Amboseli NP. That's the simple type rain gauge, and mostly enough to measure precipitation (figure2, figure3). Feeling the reality of weather measurement in local scale made me exited. Measure the fact of climate change is important for monitoring current climate and project future.

According to their research, planting trees are important way to keep the number of animals. We visited their greenhouse, next to the headquarter building (figure4). Most of nursery trees are acacia for elephants. They protect them by using electronic fence.

Figure4. Planted seeding in greenhouse
(Picture in Amboseli NP)

Figure5. Educational Object at hill
(Picture in Amboseli NP)

After the lecture, we moved to the observation hill in Amboseli NP for lunch. Whole of Amboseli swamp can be seen there. There were some educational objects we heard in lecture (figure5) with so wide, so beautiful sight.

Figure6. Overview of Amboseli swamps(The picture from the hill)

Day 6 (2nd August): Community-based conservation in Kuku Group Ranch

VOThi Thu

In the internship, we had a chance to visit Kuku Group Ranch who successfully applied community-based wildlife conservation in Kenya on 2nd September, 2013. This area has a critical role in wildlife conservation because it provides habitat for wildlife as well as corridor to connect the two important ecosystem: Amboseli National park and Tsavo West National Park. In the morning, we visited the NGO who is working for the community-based conservation in the Kuku group Ranch- the Maasai Wilderness Conservation Trust (MWCT). We met staffs who are working there including foreign researchers and local people. They gave a really nice presentation about the activities of the MWCT including nature conservation, wildlife monitoring and social service improvement.

Through the presentation, we could understand roles and activities of each stakeholder in wildlife conservation in Kuku Group Ranch. The CampayaKanzi Lodgewho provide funding for conservation activities through the $100 conservation fee of each tourist. The MWCT cooperate with the Kenya Wildlife Service (KWS) to manage activities and monitoring those activities. Community plays a critical role when provide land for conservancies and launch activities. These stakeholders cooperate comprehensively to ensure the effectiveness of the model. In this section, we realize the roles of stakeholder analysis in solving environmental problems. When we can identify clearly stakeholders who participate in environmental issues, we can plan strategies and activities to solve those issues.

We asked many questions about activities of NGO including activities of staffs, activities of each field(conservation, education and health), source of finance that support for the NGO, cooperation among KWS, NGO and local people, new technology used in wildlife conservation, status of community-based conservation (conflict between human and wildlife, participations of local people, programs to support for local people). Staff of the NGO answered clearly and detail about the activities of NGO as well as cooperation among different stakeholders in conservation in this area. Since that, we can understand more about the role of each stakeholder and cooperation among them to ensure effectiveness of the community-based wildlife conservation in this critical and sensitive area.

MWCT gave presentation about wildlife conservation in Kuku Group Ranch

In the afternoon, we visited the primary school and talked to teachers and students there. They are all nice and open-heart, especially students. They were eager to talk to foreigners. They asked us many questions about our country, our trip coming here, our life and our culture. Students also introduced us about their country, their studying and especially their wildlife. They told us about habits of animals such as lion, elephant, and guided us how to do if we met wildlife animals. Through conversation, we can understand their life as well as the love for environment and wildlife. Therefore, we believe that these young students can contribute effectively in wildlife conservation because they know and love wildlife as a part of their life.

Besides talking to students, we also had a chance to talk to teachers at school and saw school library. They explained clearly about the education system in Kenya, classes in the school, curriculum, and especially environment education which recently applied in this school. We were so surprised that 9 teachers were employed by the NGO to minimize high number of student per class, so that they can ensure quality of studying and teaching here. When we visited the school library, we saw quite large amount of books that can help students to approach more useful knowledge. This is a great effort of the school and the NGO to improve quality of education in the school.

Within one day, we could study more about the local NGO and primary school. With their great efforts, we believe that education and conservation in this area will be improved.

Students in the primary school in Kuku Group Ranch

Besides, we also visited the Kuku clinic- the sole clinic of this area. Lacking of infrastructure, doctors and medicines are main difficulties for the clinic. MWCT tried to support for the health care with many programs such as malaria test and HIV test in the near future.

We just only spent one day in Kuku Group Ranch, however, we can realize various activities that MWCT accompany with community are working to struggle with wildlife degradation and livelihood improvements. These activities are good examples for us to identify the relationship among different stakeholders in solving environmental problems. The effectiveness of programs requires further research, however, efforts of NGO and community are clearly seen.

Day 7 (3rd August): African Wildlife Fund

PHAM Thi Thanh

On the last day in Amboseli, after having breakfast we left hotel at 7 am, at this time the sky was clear and beautiful with blue colour. Although it was still a little bit cold in the morning however all of us were very excited with new day here. We spent 30 minutes to reach Amboseli National Park after that we went inside and start 3 hours game driving on the way to African Wildlife Foundation (AWF). Luckily, our car diver has a lot of experiences in driving as well as well-known about wildlifes, so when he drave the car and he also talked about characteristics of wildlife passionately. We were very happy with his easy-going and enthusiasm in the role of a guider.

Photos: Wildlife in Amblseli NP

Early in the morning, we saw many different kind of animal moving in groups to swamp such as Elephants, Zebras, buffalos… Swamp is hidden nature's treasures that irrigated by ground water coming from highest, largest single mountain of the Africa namely Kilimanjaro. Therefore, it becomes one of the most important places to provide water, food and an amazing ecosystem for this park. However, the amount of ice on the top of Kilimanjaro decreased significantly. Therefore, in the future wildlife will face many problems related to climate change for instance lack of water, increasing drought…

Glacier on Mt. Kilimanjaro decreased significantly, and this is very danger for wildlife in the future.

Studying at African Wildlife Foundation

After 3 hours game driving on the way to AFC, we reached Amboseli western gate. Here we met some Maasais selling their products such as necklace, pierce… we took a rest some minute and then we continue our journey. And we came to AWF at 11:30 am, although all of us felt a little bit tired and hungry however we were very excited with lecture "Biodiversity, land use and livelihood". In this lecture, Mr. Philip Lenaiyasa presented the role of AWF in Wildlife conservation here clearly such as they acted as bridge among organizations, Local people and Maasai people… and he also talked about land use, habitat conservation, conservation enterprise and payment ecosystem service. It seems to be that they got many good results when participated in Wildlife conservation so far. I also had strong impression about video he showed. It was luxury resort chain with expensive cost for tourists, money get from it will contribute to wildlife conservation and local community such as building the school, improving health care condition etc. However, I thought that if they buil many resorts area what happen with environmental condition here in the future. We were really interesting that lecture and we asked questions to him: How can they deal with overpopulation and subdivision around national park, What is the planning for development and management enterprise resorts chain with out harming wildlife animal in sustainable way? He also gave us answer that to tackle with overpopulation and subdivision it is still difficults problem and need participation of multi-stakeholders, they also buy land or rent land of local people to make more free space for wildlife animal. In the future, they will build more resorts chains to get more money for conservation and benefit local people. After 2 hours and 30 minutes with interesting lecture and many question and answer from both side we finished at 2h30pm and we had late lunch together with smiling and happy.

EDL Tsukuba and JSPS Nairobi Joint Workshop 2013

(By Environmental Diplomatic Leader Education Program (EDL) of University of Tsukuba
and Japan Society for Promotion of Science (JSPS) Nairobi Research Station)

September 5th, 2013 at JSPS Nairobi Research Station

Aim:

In order to promote and serve the development of environmental diplomacy professionals in regions of Asia and Africa, the Environmental Diplomatic Leader Education Program (EDL) was established in 2009 at the Graduate School of Life and Environmental Sciences, University of Tsukuba, Japan. One of the major training courses of EDL Program is to hold international internship to improve practical knowledge and skills of our candidates on various environmental issues. With supports from JSPS Nairobi Research Station, University of Nairobi, Kenya Wildlife Services, UNEP and other institutions, we have accomplished a successful field-study program between Aug. 28th and Sep. 3rd, 2013. This joint workshop is to report our activities and request suggestions for further progress from both Kenyan and Japnaese researchers.

Program:

10:00-10:20 Introduction: Aim and Achievement of EDL Kenya Internship 2013

SUN Xiaogang, *EDL Associate Professor, University of Tsukuba*

10:20-11:00 Urbanization in Nairobi: Challenges and Threats

SHI Wansheng and Temulun, *EDL Ph.D and Master candidate, University of Tsukuba*

11:00-11:40 Development vs. People vs. Environment in Kenya（Culture/Environment/Education）

LU Mengqian and KOYAMA Nika, *EDL Master candidate, University of Tsukuba*

11:40-12:00 Comment

Dr. Francis Mwaura, *Department of Geography & Environmental Studies, University of Nairobi*

12:00-13:00 Lunch

13:00-13:30 How local people adapt to Climate Change in Kenya?

MIKI Yurisa , *EDL Master candidate, University of Tsukuba*

13:30-14:10 Community-Based Conservation in Kenya, Case study: Karura Forest, and Kuku Group Ranch

KHONSAVANH Vilaysack and VO Thi Thu, *EDL Master candidate, University of Tsukuba*

14:10-14:40 Conservation activities in Amboseli National Park

PHAM Thi Thanh, *EDL Master candidate, University of Tsukuba*

14:40-15:10 Promotion and Challenges of Ecotourism in Amboseli Area

Michael Assefaw, *EDL Master candidate, University of Tsukuba*

15:10-15:50 General discussion

15:50-16:00 Closing Remarks

Dr. SHIRAISHI Shoichiro , *Residential Director, JSPS Nairobi Research Station*

Panorama of Nairobi city

Nairobi University Campus

Nairobi University Campus

UNEP Headquarter

UNEP Headquarter

UNEP Headquarter

Karura Forest

Restaurant in Nairobi

Environmental Education at KWS

Kenya Wildlife Service Headquarter

Visiting Maasai Village

Visiting Maasai Village

Lecture at KWS Amboseli station

Lecture at Kuku Group Ranch

Lecture at African Wildlife Foundation

JSPS Nairobi Research Center