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Green Forest Businesses as a Method to Improve Communities in Unesco's East Usambara Biosphere Reserve in Tanzania

Myoung Su Ko

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GREEN FOREST BUSINESSES AS A METHOD TO IMPROVE COMMUNITIES IN
UNESCO'S EAST USAMBARA BIOSPHERE RESERVE IN TANZANIA

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ABSTRACT

A number of developing countries, especially those in Africa which have experienced former colonization, are still struggling with exploitation of their natural resources. Throughout the development of environmental management, the strategy of natural resource management has evolved from mistreating the environment for economic and social development, to separating human activities from the environment for extreme environmental protection, to ensuring the interaction between human life and environment for sustainable development. Although an abundance of natural resources, and particularly forests, exist in the protected areas, the residents in communities surrounding protected areas are usually economically and socially poor.

With this situation, the most current trend in forest management strategy is Participatory Forest Management (PFM). This is originally preferred by the countries which have vast forest lands, but limited funds for the forest management. Therefore, mobilizing community engagement for the forest management is a key factor for PFM implementation. However, the lack of capacity and lack of socio-economic means for the communities to become engaged in this effort has been issue.

One way to address PFM is to increase community success with green businesses in these protected areas. This study evaluated the use of six green businesses and compared two training methods to evaluate the impact of the Green Economy in Biosphere Reserve (GEBR) Project to improve community capacity and socio-economic

success. This study evaluated a paid versus volunteer training method and assessed the socio-economic impacts based on income, number of associations and use of revolving funds to build the business but also improve social conditions such as education and welfare. Based on limited data, the volunteer training in local communities provided a longer-term success rate than centralized paid training and community awareness sustainable natural resource of use was elevated. a development with environmentally sustainable income generation activities, diversifying the livelihoods of community members.

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CHAPTER 1

INTRODUCTION

Tanzania is well known for its abundance of natural resources, especially its forests; however, maintaining these resources has been a continuing concern. During the colonization period under Germany and England, the country adopted environmental protection methods which recognized the value of the natural resources; however, its environmental protection system became the framework for easier environmental exploitation. Following the colonization period, the environmental exploitation has continued, as a result of the country's focus on economic growth. This is highlighted by Tanzania's loss of 19.4% of its forest area between 1990 and 2010 (Mongabay, 2011). This loss has drawn the attention of the Tanzanian government and international donors for developing a policy for more effective environmental protection.

While Tanzania has many environmental issues, this study addresses forest management. Countries in Africa, like Tanzania, which have very large forested areas, struggle with lack of funding for policy implementation for environmental protection of these forest ecosystems. To compensate, they have started to decentralize the community authority to manage the forest areas through the Participatory Forest Management (PFM) approach that demands the participation and engagement of communities surrounding the forest for the forest management. Currently, Tanzania has the most advanced legal systems, which value and motivate the community involvement in terms of Joint Forest

Management, as a type of PFM. This study assumes that this trend of policy making could be positively connected to another strategy of the framework of UNESCO, called Man and Biosphere (MAB) program. The MAB program receives nominations of protected areas, Biosphere Reserves (BRs), from all the UNESCO member countries, and through this program currently connects 686 biosphere reserves in 122 countries. A key factor of BR management is that the program demands community engagement. The MAB program originated in the 1970s and pre-dates the United Nations defined Sustainable Development goals. The importance of harmonization between human activities and the environment was first demonstrated in the MAB program against the globally more popular approach at that time which separates humans from environment by creating national parks. This interaction between human and nature in the MAB program increased the attention on mobilizing communities around the BRs for BR management.

Both PFM, according to World Conservation Strategy was published by IUCN, and BR program (Brunkhorst, 1999) have primary goals of making a strong impact and managing the protected areas with community engagement. However, this engagement has been difficult, since both programs have been slow to develop their implementation guidelines and, therefore, only have a few successful stories of PFM and BR program in Africa. This thesis assumes that the implementation struggles of PFM and BR programs might be specifically different in Africa and also each country within Africa, due to the existing policies, cultures, social and economic conditions of the communities surrounding the forests.

Most of the communities surrounding the protected forest areas were considered as under-educated and economically depressed (Sunderin et al., 2005). For these reasons, these residents may have a limited capacity to make decisions and negotiate for the forest management while having extreme dependency on the forest. This study assesses whether communities around the forest areas can increase their socio-economic position through running environmentally-friendly income-generation activities and if this position would impact the community's interest in forest management.

This study evaluates the case of Green Economy in Biosphere Reserve (GEBR) Project in Tanzania as a pilot of community capacity building program which was implemented from November 2013 to October 2017, benefiting about 1,000 residents in the surrounding communities of the forest. UNESCO considers that this project as one of the successful stories of community capacity building within the BR framework of UNESCO MAB programs in Africa. The project area is located within one of the 34 biodiversity hotspots in the world, includes 90,000 hectares in the Tanga region of Tanzania in part of the Eastern Arc Mountain range, and was designated as a forest BR in Tanzania in 2000, named the East Usambara Biosphere Reserve (EUBR).

Therefore, this study addresses the research question, "How does the UNESCO Biosphere Reserve program and the Green Economy economic development approach impact the community and community forest management in the Usambara Forests of Northern Tanzania?" To address this question, the thesis will discuss: 1) origins and characteristics of UNESCO MAB program and PFM at both the global and national level, 2) the history and character of the EUBR as a targeted area for GEBR Project, 3) a literature review to evaluate the differences between PFM and UNESCO MAB program

and important factors for mobilizing the community to participate in forest management, and 4) the case study of GEBR project in Tanzania.

By reviewing how the UNESCO MAB program and PFM were implemented and their characteristics internationally and in Tanzania, specifically within the project area, EUBR, these two approaches may indicate a synergy when they are implemented at the same time. Also, through analyzing the previous studies on both BRs and PFM in Africa and Tanzania, the study may identify the factors of community mobilization which are suitable for many similar conditions with the ones of EUBR. In the case study of GEBR project, the study would show the importance of the process of engaging the communities through their capacity building which is mainly focusing on social and economic improvement in the communities through the green business.

CHAPTER 2

THE HISTORY OF BIOSPHERE RESERVES AS PROTECTED AREAS

1. Protected Areas of the International Union for Conservation of Nature (IUCN)

The modern idea of classifying protected areas originated in the nineteenth century from North America, Australia and South Africa (IUCN 2007). The history of protected areas for environmental conservation emerged with the first national parks, Banff (1885) in Canada and Yellowstone (1872) in the United States from the concept that human activities for economic development and industrialization would not preserve or protect nature and the wildlife. (Doyon and Sabinot, 2014). This idea was expanded to other continents during the twentieth century, however the drivers of this movement in different locations was not the same. For example, North America's driving force for protected areas were safeguarding its scenery, while Africa's focus was on game parks for wildlife protection and Europe's was landscape protection (Dudley and Stolton, 2008).

Recently, most of the countries in the world have accepted protected area regulation and nominated sites for protection with various drivers such as public, private, community and volunteer organizations. Though each site was developed within its nation's own standards and strategies, there was commonly a shared view to identify scientifically important areas, the locations for wildlife and the places allowing outdoor recreation (IUCN 2007), which required the need for common standards and terminology

on protected areas. Due to the various environmental conditions and characteristics of different protected areas, it was necessary to take actions and enter dialogues to categorize them depending on the objectives of the protected area management categories.

The IUCN took the responsibility to develop the preliminary system of protected area management categories since 1962 through IUCN's response to the recognition of UN Economic and Social Council (ECOSOC) in 1959 on the movement of a global conservation after the Second World War through the "World List of National Parks and Equivalent Reserves" (the first version of "UN List of protected areas") in 1962 during the First World Conference on National Parks in Seattle (Dudley and Stolton, 2008). It was the first effort to explain the terminology on protected areas in 1963 at the international Conference for the Protection of Fauna and Flora in London with the four categories; national park, strict nature reserve, fauna and flora reserve, and reserve with prohibition for hunting and collection. The Western Hemisphere Convention on Nature Protection and Wildlife Preservation in 1942 also suggested four types of protected areas; national park; national reserve; nature monument, and strict wilderness reserve (Dudley and Stolton, 2008).

IUCN Commission on National Parks and Protected Areas (known as World Commission on Protected Areas) suggested protected area categories in 1962 and, after its discussions and updates, the six categories based on the management objectives are: "I. Strict protection (Ia) and Strict nature reserve (Ib); II. Ecosystem conservation and protection; III Conservation of natural feature; IV. Conservation through active management; V. Landscape/seascape conservation and recreation; and VI. Sustainable

use of natural resources” (IUCN, 2013) were approved by the IUCN General Assembly in 1994. Later in the same year, “Guidelines for Protected Area Management Categories” was published by IUCN and the World Conservation Monitoring Center (IUCN, 2013).

The key principles of the 1994 guidelines are: “1)The basis of categorization is by primary management objective assignment to a category is not a commentary on management effectiveness; 2) The categories system is international; 3) National names for protected areas may vary; All categories are important and A gradation of human intervention is implied” (p.15, Dudley and Stolton, 2008). The 1994 guidelines were reviewed and received many comments, together with supporting the project “Speaking on Common Languages”. The revised draft guidelines were presented in a Steering Committee meeting of the World Commission on Protected Area in 2007 and final decisions were made in 2008.

IUCN and its partners tried to develop the categories to find the middle ground between the needs and situations of different countries. They are not perfectly suitable for all areas, but assist to direct interpretation and application at the regional and national levels. The value of the categories depends not so much on whether each protected area can be allocated to one of six categories but on whether the objectives of categorization are met. Since the publication of the 1994 guidelines, there has been increased assessment of the roles of protected areas, and debates on relations among protected areas, and their different roles and objectives (IUCN, 2013).

According to the definition of protected areas from IUCN, it is “an area of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective

means.” (p.9, Dudley and Stolton, 2008). This concept of the protected area was sometimes manipulated for economic development and the private sector’s benefit though its goal is environmental conservation. During 1980s, neoliberal policies influenced an increase in protected areas globally and frequently with the purpose of resource extraction around protected areas such as areas for mining activities combining with conservation areas. These policies for protected areas created the changes to access to the protected land, privatization of land and resources, and separation between locals who have lived in and around protected areas and the nature. Among various types of reserves in the world, UNESCO’s Biosphere Reserves (BR) Program has been considered an alternative for the traditional model of protected areas (Doyon and Sabinot, 2014).

2. The Origin of Man and Biosphere Program

Each of the UNESCO Biosphere Reserves is a combination of different categories of protected areas of IUCN as a driving system for management on protected areas based on the different zones which have various environmental and socio-economic characteristics. Behind the current framework of the BR program, there have been countless discussions and debates of UNESCO, IUCN and their partners moving towards the best management on environmental conservation. The origin of Man and Biosphere Program (MAB) which includes Biosphere Reserves was much influenced by the IUCN conservationists’ research and their endeavors for environmental protection and maintenance based on three elements; 1) “biological diversity”, 2) “those natural resources that are compatible with biological diversity”, 3) “those associated cultural resources that are compatible with

biological diversity”. As a result of these, the MAB program has been considered as “problem-oriented-practical programs” (Schleper, 2016).

The traditional focus on environmental conservation of IUCN was mainly for specific species conservation in the areas, previously colonized in Africa and Asia. However, IUCN initiated the concept of ecosystem conservation as science-based approaches at global level beginning in 1954 and proclaimed its new attention on natural resource management in 1956. These different focuses between “more fundamental ecosystem research” and “conservation for threatened species” within IUCN conservationists were clearly evident in one of the seven international sub-committees, Conservation Section, of International Program on Biology (IBP/CT) (Schleper, 2016).

International Program on Biology (IBP) was originally founded based on concerns of limited natural resources at the global level and the needs of an international biology program to develop life and geo-science. Jean George Baer, who was the IUCN’s president, proposed the topic for IBP for the biologically and directly threatened communities even though IUCN’s traditional conservationists’ focus was on threatened individual species in certain locations. However, his suggestion was not fully included in the process of IUCN’s involvement in building IBP program. This led to uncertain objectives on the network between IUCN and IBP. Later, the affiliation between the organizations was decided to be within IBP/CT section through the new program, the “New Scientist” which concentrated on the ecosystem conservation and research for conservation.

To achieve this goal, IBP/CT created a project on classification and a check sheet survey to learn the trends of the protection condition of the world’s ecosystem and to

identify and classify ecosystem types in quantitative and fundamental manners in the world, led by the section convener, Edward Max Nicholson. The context of the check sheet survey had predictive power on the potential prosperity of crops and animals at the global level of conservation and land use. This concept is top-down base management, balancing ecosystem with holistic and technocratic planning approach through linkage among society, land, and natural resource management (Schleper, 2016).

Contrast to the IUCN conservationists lead by Nicholson, some members of IUCN had recognized and strengthened their international status through the UN organization. Therefore, they targeted the close collaboration with UNESCO which can support IUCN's research and activities with resources (Schleper, 2016). Before the MAB was created, UNESCO focused on research and mapping the global nature, especially as a major player to map the world vegetation types which attracted IUCN's traditional conservationists, since the system for world vegetation could be means of environmental conservation through isolated nature sanctuaries.

Initially, UNESCO's vegetation classification for conservation targeted the use of local conservation, especially within the areas which are arid and humid tropical, valuing the bottom-up initiations of local communities and nations which was opposite to the political frame work to accept the concept of CT/IBP. The scientists in IUCN formerly worked for UNESCO, such as Director General of IUCN, Gerado Budowski and Union's Senior Ecologist Raymond Dasmann, making effort to connect the characters of UNESCO's conservation with their concepts. Dasmann developed the concept that emphasizes the relations between society and man for the contents of conservation. Moreover, since the 1970s, Dasmann thrived on a bioregionalism method in which

environmental protection should be related to the traditions and culture of locals, therefore, the designs and implementation of conservation should start from the grass root level with collaboration of the culture of indigenous population in the communities and the regions (Schleper, 2016).

In 1969, during the Inter-Agency Consultation Meeting at UNESCO, the structures and international scientists' network of IBP adopted the incorporation with UNESCO's Man and the Biosphere Program (MAB) and this collaboration between IBN and MAB was continued after the closure of IBP in 1972 (Schleper, 2016). Within this integration, it was important to accept and mix both aspects to create the most useful guidelines for MAB implementation, as MAB was no longer limited to the conservation for specific species and location but extended its influence throughout its Biosphere Reserves (BRs) in the world. As a result, the data on vegetation structure with climatic, species and conservation information in global level from the check sheet survey of CT/IBP was eventually stored in early ATLAS 2 computers to be used for selecting new BRs and planning conservation projects. In 1973, MAB created the guidelines on BR networks based on the combination of CT/IBP check sheet survey and Dasmann's new classification which altered physiognomic approach of Forsber's classification in UNESCO species identification focused classification. Though there have been several scientist's modification and correcting of errors, this system has been the foundation of decision making on new BRs nominations.

UNESCO founded Man and Biosphere Program (or Biosphere Reserves (BRs)) in 1971 with a unique approach with environmental conservation, at a time when the norm 'conservation' was considered as against development (Bouamrane, M., M. Spierenburg

et al, 2016). During the first phase of BRs (1974-1994), the BRs were valued based on their ecological uniqueness and were presented as field laboratories which allowed scientific research to understand their value as well as their environmental issues at the regional and international level. At the same time, there was some suggestion for BRs to support economic development from scientists, but it was not implemented (Reed, 2016). In this regard, BRs were established not just for conservation, but also for considering economic development.

The second phase of BRs started in UNESCO General Conference in 1995 and continues to the present. Since the Seville Strategy emphasized the BRs as platforms to show the examination of harmonization between human beings and nature through their interconnection, the Seville Strategy shares common values based on the relevant actors' continuous collaboration and discussions (Bouamrane et al, 2016). The Seville Strategy made BRs' main role toward Sustainable Development the promotion of economic and environmental activities under "environmental consciousness" of local communities (Doyona, and Sabinotb, 2014). By the suggestion on zoning systems with BRs, such as: core, buffer, and transition zones, BRs have divided areas which allow human activities in buffer and transition zones and which do not allow activities in core zones. Together with the Seville Strategy, the Statutory Framework was also adopted in 1996 and this led BRs to have three functions; (1) conserving biodiversity; (2) fostering sustainable social and economic development; and (3) supporting research, monitoring, and education (Bouamrane et al 2016, UNESCO 1996, Schultz et al. 2011, Bridgewater 2016).

According to UNESCO (2012), the purpose of the Biosphere Reserve creation is 'to promote sustainable development based on local community efforts and sound science'

and ‘reconcile conservation of biological and cultural diversity and economic and social development through partnership between people and nature; they are ideal to test and demonstrate innovative approaches to sustainable development from local to international scales” to achieve the three functions interconnections among conservation, development, and logistic support” (p. 137, Doyon and Sabinot, 2014).

The nomination of BRs is authorized by the governments of UNESCO member countries and, once approved, the designated BRs get connected to the World Biosphere Reserve Network (WBRN) which is another important function of BR as a global learning platform of Sustainable Development. The Lima Action Plan (2016-2015) provided a global agenda for WBRN to attain the balance of three pillars of Sustainable Development; “the economic, social and environment” (UNESCO, 2017). It was highlighted in Outcome 2 of the Lima Action Plan, “the MAB Program will concentrate its support to Member States and stakeholders in conserving biodiversity, restoring and enhancing ecosystem services, and fostering the sustainable use of natural resources; contributing to sustainable, healthy, and equitable societies, economies and thriving human settlements in harmony with the biosphere; facilitating biodiversity and sustainability, education for sustainable development and capacity building; and supporting mitigation and adaptation to climate change and other aspects of global environmental change.” (Bridgewater and Babinc, 2017).

3. Biosphere Reserve Management Challenges

The change of trends in relationships between humans and nature has also influenced the trends for approaching environmental management. According to

UNESCO (2013), the most current approach of environmental management shows more integration of previous approaches, such as ‘end of pipe’ approach, polluter pays principle, and precautionary approach and alternative approaches which are the harmonization of several approaches (outlined below), based on the concept of harmonization between economic and social development and environmental issues because each approach has weaknesses which can be fulfilled with others. These integrations are well matched with the management of Biosphere Reserves. For example, the original environmental management approach, ‘end of pipe’ approach, also called the ‘stick’ approach, focuses on the impact of pollution after it has occurred, and, therefore, it cannot address the situation which caused the pollution. However, this approach may be useful to treat certain issues such as waste management since this requires restrictions and limitations as well as technological solutions. This approach often includes penalties when the management is conducted inappropriately and then the polluter pays principle (3p) is used. The principle includes the idea that: I pollute, and I will pay. Although 3p approach is not thoroughly recognized in all aspects of society, it is suitable for the core zone in protected areas which restricts human activities for environmental conservation.

Additionally, UNESCO suggested precautionary principles can be useful for justifying preparation on some human actions which might cause environmental problems. Adoptative management’s function for collaboration among local stakeholders outside of the reserves was emphasized, as well as the importance of adoptative management to improve environmental management and sharing knowledge. The ecosystem approach highlights the needs of multilateral collaboration in terms of implementation (Scoullous, 2013)

BRs serve as models for the areas influenced by environmentally negative human interventions, but provides solutions for these issues through suggesting and practicing management with local communities (UNESCO-MAP Secretariat, 2010). However, the implementation of BRs in WNBR shows unevenness, especially older sites which struggle to understand the combination of the BRs' functions and focus on the role function of environmental conservation (Bouamrane, 2016). Despite 40 years of history since BRs were initiated, there have been few efforts to distribute messages and visions of BRs through environmental governance and its structure and decision-making (Drahomíra et al, 2008).

Lack of local communities' involvement in decision making for management and natural resource use also hampers Sustainable Development implementation in BRs. (Bouamrane, 2016). Usually local communities do not properly understand the function of BRs and have lack of knowledge on the vision of BRs and its linkage with Sustainable Development as well. The nomination of BRs is mainly led by national governments, but its implementation is left to local communities, which gives flexibility for local communities to find their own way for implementation, but at the same time the national government does not provide support to link the BRs management to the national policies and regulations (Stoll-Kleemann, 2018).

The local communities' and diverse stakeholders' involvement in BRs environmental management decision making is also caused by lack of time and resources. (Jackson et al, 2011, Hertzman 2011; Jonegård 2011). "Issues like coordination between different institutions (local, sub-national and national as well as international cooperation, private sector and society as a whole) can be a headache. And we need innovative ideas

to help producers and resource managers secure markets for their products. In this field, we are in the process of consolidating existing partnerships with local universities, research and training institutes as well as strengthening private sector participation.” (Pedro Gamboa, Director of Peru's National Service for Protected Areas SERNANP, Jackson et al, 2016, Biosphere Reserves-inspiring action for Agenda 2030, GIZ).

There is also ambiguity on the definition of successful BRs’ as well. All the BRs are managed in their own ways based on their uniqueness and the characteristics of BRs themselves, including governance and stakeholders. Also, successful BRs cases are from profoundly different circumstances in terms of different standards of living, surrounding community’s education level, different levels of biodiversity conservation, and so on. Therefore, the strategies of successful BRs cases from European countries are sometime difficult to apply in the BRs in the African continent. In this regard, the guidance for BRs’ nomination and management provided to the BR regions from the MAB program might have helped the BRs’ management to move forward to successful BRs, but it does not support the national authorities to understand the definition of successful BRs as well. The guidance is too negligible to analyze the success of the results due to the lack of standards on planning, structure for decision making and choosing suitable methods for implementation in BRs (Jackson et al, 2016).

Biosphere Reserves rely on national governments’ capacity for its management, improvement, and state involvement as well as its legal framework. It is for respect of their own cultures, systems, economic and political status and situations and supports the diversity which comes from the combination of cultural, environmental, social and economic differences in different countries and locations. However, this resulted in

differences among the countries in terms of the quality, speed and promotion of Biosphere Reserve management. These characteristics directed toward strengthening the capacity of the local governance for efficient BR management for interconnection among ‘conservation, development, and logistic support’ as UNESCO (2012) is heading to achieve.

Based on this analysis of challenges on BR management, this thesis will study whether improving economic conditions in communities surrounding BRs increases community support BRs. The project in East Usambara Biosphere Reserve (EUBR), the Green Economy in Biosphere Reserve (GEBR) project, Tanga, Tanzania, was designed and carried out under the circumstance of unique cultural, environmental and economic conditions. It would be difficult to generalize all biosphere reserves with applying the strategies for BR management of the one project case. However, through the experience of the EUBR project, an example of both failed and successful results is provided and, therefore, the BR management in the future would be able to selectively refer to this example to develop and implement the proper approaches on each BR’s different environmental, social and economic situations. In this regard, the thesis will present how the new methods were designed and applied and describe those changes, during the implementation of the GEBR project, to avoid recognized issues in previous experiences in Biosphere Reserves as well as forest management and protected areas.

CHAPTER 3

HISTORICAL REVIEW OF FOREST RESERVE MANAGEMENT IN TANZANIA

1. Forest Management in Protected Areas

In Africa, Tanzania has largest number of mammals, ranks second for the largest number of plant species (approximately 10,000), fourth for the amphibians (123 species) and in the fourth for the reptiles (245 species). A more important factor is that the forest includes the habitat for all these species. The forest sector in Tanzania not only plays an environmentally important role nationally and globally, but also it is considered as the most crucial foundation for national economic development (UNEP, 2002).

In terms of water resources, soil protection, air circulation, the balance of hydrological circumstance, materials for construction, etc., (UNEP, 2002), these contributions from the forest sector support the biggest industries in Tanzania, such as agriculture through non-wood forestry production, such as fruits, medicinal plants, honey and so on, mining and tourism. Agriculture accounts for 29% gross domestic production, 20% of the total exports and engages about 76% of the population in Tanzania. The tourism sector has generated the largest foreign currency (9.3% with USD 4.5 billion, 2014) and the mining sector represents 27% of total exports (2019, Tanzania Invest). Overall, the involvement of the forest sector for entire exports is about 10-15% with

wood and non-wood products and for foreign exchange is 10% relatively (UNDP, 2017; MNRT, 2015). Moreover, the forest supplies more than 90% of energy resources as bioenergy such as firewood and charcoals as well as about half of Tanzania's construction materials (UNDP, 2017).

The economic importance of the forest sector can also be related to too much extraction and consumption of natural resources from the forest which causes deforestation. The fast population growth, high level of poverty, heavy dependency on agriculture have also aggravated the deforestation, loss of biodiversity and water catchment areas (UNDP, 2017). Estimated economic cost of deforestation is about USD 8 million annually, based on comparing economic value and environmental costs for the case of increasing logging and forestry related production (UNEP, 2002, P.5).

However, UNEP estimated that the sustainable forest production and harvesting with environmentally friendly and efficient forest management would contribute about 7% to the country's total GDP in 2002 (UNEP, 2002, P.11). Therefore, considering all these environmental and economic influences of the forest sector, it is vital for the country to develop forestry and biodiversity conservation strategies to improve forestry livelihoods and employment as well.

Based on the recognized importance of the forest sector, Tanzania has created many protected areas. The forest still covers 37.7% of total territory, after losing 19.4% of forest area between 1990 and 2010 (Mongabay, 2011). Under IUCN Categories I-V, 14.6% of land in Tanzania is protected (Mongabay, 2011). Given this condition, Tanzania has made great efforts to establish Protected Areas (PAs) for more than 50 years, and these efforts have resulted in the creation of 792 PAs, equal to 38% of the total territory

of Tanzania. These PAs include not only National Parks and Game Reserves, but also, “Biosphere Reserves, Ramsar Wetlands, Community Based Wildlife Areas (CBWA), Community Based Forest Areas (CBFAs), Joint Forest Areas (JFAs) and Community Conservation Areas (CCAs)” (P.5, Stellmacher et al, 2012). Out of Tanzania’s total forested land, 37% is forest reserve, under management of the state Forestry and Beekeeping Division (Mgaya, 2016).

In addition to the current PAs, Tanzania has shown a stronger commitment to creating more PAs through all parties’ adoption on the targets to the Convention on Biological Diversity with ambitious conservation targets, in Strategic Plan for Biodiversity 2011-2020. The Aichi Target 11, which was adopted by the Convention on Biological Diversity (CBD) at its Nagoya conference, became the mechanism for achieving the conservation goals and the country has preserved 35.5% of its territory and 13.5% of its marine territory with PAs (IUCN, 2017). However, creating more PAs does not mean that more areas in the country will be protected without better management strategies for the recognized areas. Therefore, this chapter will include a review on the changes and trends for environmental management for the forests as well as PAs in Tanzania.

2. The Changes of Historical Trends in Forest Management

Before Tanzania was colonized, customary law and tenure were implemented by traditional systems and local leaders based on its norms and taboos (Kalumanga et al., 2018; Barrow et al., 2002; Kajembe et al., 2005). The forest was considered as common land which provided food and medicine as well as spiritually important meaning with

scattered population. Without any advanced technology, the forest was environmentally and sustainably maintained, primarily through fire (Kalumanga et al., 2018).

When the Germans colonized Tanzania (1885-1918), they brought the scientific forest management plan which is the European trend of forest conservation excluding human settlement inside forest and creating forest reserves (Mgaya, 2016). Germans created the first environmental regulations in 1891 in Tanzania to control wildlife utilization and natural resources for the use of both Europeans and Africans (Death, 2012). These limited the local population's access to surrounding forests, actually starting after 1885, through the DOAG (German East Africa Concession Company's business for trading forest products) (Mgaya, 2016).

The first international agreement on forest management was in 1900 and introduced the idea of protection of African wildlife by colonial countries to protect wildlife in Africa from the danger of extinction (Mgaya, 2016). In line with this agreement, Germans transferred their scientific model to Tanzania, such as creating Crown Land Ordinance on 1895 and issuing the forest conservation ordinance in 1904 which followed the requirement on the tree size and species to satisfy the industrial standards and aimed to claim the forest reserves as state properties. This model attempted to control people's access to the forest, with the idea that African users were the major threats to the colonial use of the natural resources in the forest. However, this era is considered significant for the concept of public land management and its protection and measurement for physical boundaries and diversity of natural resources (Conte, 1996: 109; Mgaya, 2016), even if there was strong confrontation from the locals that resulted in the lack of implementation of these new policies (Mgaya, 2016).

In 1919, the British started to govern Tanganika, the mainland of current Tanzania with the League of Nations mandate that agreed the natural resource management would take account on “native laws and customs, and respect the rights of the native population” (Mgaya, 2016; P.491, Neumann, 1997:48). The British established the first Forest Policy in 1953 and the first forest Ordinance in 1957 (Kalumanga et al., 2018). However, the Germans’ forest policy was not only still sustained, but also was reinforced in terms of the government’s absolute control on the forest through creating more protected forests to regulate certain tree species and access to the forest reserves for the conservation and the increasing economic benefits (Mgaya, 2016).

As a result of the British intensive regulation trends, up to the year of 1925, Tanzania hosted 212 forest reserves, covering 3707 square miles, called this period as the “Conservation Boom in British Colonial Africa” (Mgaya, 2016. P. 50, Neuman, 1998:50), basically changing human settlements to free the forest reserves from the local livelihoods and access. It was a momentous example of this trend that Serengeti National Park removed the Maasai settlement from the park. The emptied forest from the human settlement was eventually transformed into agricultural land for tea, coffee, exotic fruit and timber business to raise the revenue for the British (Kalumanga et al., 2018; FAO, 2013). In other words, it limited the access to indigenous peoples but opened the area to British agriculture which led to a strong hatred and denials from the local populations toward the policy, who has had a sturdy relationship with nature for social and economic purposes (Mgaya, 2016).

Dealing with the local resentment, the British decentralized the authority, limited to some sites by establishing Native Authority Forest Reserves in the early 1930s which

delegated partial responsibility for forest protection to the natives within the different systems politically acceptable for the local needs. (Mgaya, 2016). However, exploitation was continued in the government's owned protected forest and they were mainly managed by foreign industry through plantations and local communities were excluded in this process (Kalumanga et al., 2018).

Going through the colonial states, Tanzania experienced and practiced resource management and conservation which adopted "coercive, command-and control styles of environmental planning and management" (Death, P.7, 2012), though areas such as Serengeti, Selous and Mount Kilimanjaro were discovered as significant and symbolic wilderness in western world through that period.

The first forest policy, National Forest Policy (1953) also included the colonial structures which did not involve the non-state actors in the centralized forest management. The Forest Ordinance in 1957 allowed both foreign industry and local government to benefit from the forest, but mainly focused on commercialization of the forest resources. However, it allowed the public freedom to use the Native Authority Forests under Native Authority Management and the public lands, except for some specific species (Kalumanga et al, 2018).

During the period of President Julius Nyerere under the post-colonial government, this environmental management style was inbred and combined with Nyerere's African socialism, which demonstrated the importance of agriculture and rural policies that practice the command-and-control style of rural planning. This was the largest performance of rural social engineering in the twentieth century (Death, P.7 2012), which was called "Ujamaa" or "Villagization" project. With the Mozambique civil war

approaching the Tanzania border between the late 1960s and early 1970s, and with the stated intention of protecting the Tanzanian population living near the border (Jennings, 2008), the Ujamaa project allowed the government to move 70% of total rural population to the other villages away from the border which government constructed.

The forests and pastures surrounding of the abandoned border villages became under the control of state government by the law of transformation. This movement was supported by international institutions for Tanzanian affiliated elites to raise the timber export business from these forests previously owned by the now abandoned villages (P.73, Wasserstrom, 2018). Even through, the National Forest Policy of 1998 allowed some local communities to participate in the management of forest reserves, and protected areas were separated for conservation, the country's main focus for the natural resource management was based on the economic needs of the country, such as commercial interests and state revenue through mass production on logging, plantations, mining and exporting crops (Kalumanga et al., 2018).

In addition to commercialization of the natural resources, the agriculture and rural policies also promoted the clearing and burning of forests for small-scale agriculture to increase food production and international crops trades which also improved the revenue for the government in 1970s (P.7, Kalumanga et al, 2018; Zahabu et al., 2009; 2009; FAO 2013). From 1980 to 1993, an additional 25% of forest area in the country was lost for mining and logging. (Kalumanga et al, 2018; WRM 2002).

During this time, the law was changed to guarantee the central switch to the government for the remaining forests and pasture, the situation also attracted international donors from the West to provide financial support for environmental conservation and

economic development through well-known international environmental NGOs, like the World Wide Fund for Nature (WWF) and the International Union for the Conservation of Nature (IUCN). The Western donors started to fund WWF to protect the wildlife from poaching in the 1980s but eventually the support directly went to Wildlife and Forestry departments in 1990s under circumstance of harmonization between international donors activities and government policies in Tanzania, which allowed the country more ownership on environment management (Death, 2016, p.8).

Since the late 1970s, research regarding these local communities has included the impact of forest management and addressed the local people's right to use the forest resources. Moreover, the research has shown that including communities in forest management is more cost-effective and sustainable when local knowledge about the forest is used. Institutional capacity for forest management is improved if the awareness on the environmental issues for communities surrounding the forest is increased (Kalumanga et al., 2018). As a result, the Eighth World Forestry Congress in Jakarta, Indonesia, raised the theme 'Forests for People' in 1978, and international leading donors started to reinforce this approach in their aid programs, which are the concepts known as, "social forestry, agroforestry, joint forest management, community forestry, community-based forest management" (Kalumanga et al., P.8, 2018; Colfer, 2005, p.38)

During the 1980s, World Conservation Strategy was published by IUCN and introduced the concept of 'sustainable use' in natural resources. This new concept changed international conservation trends from protecting nature separated from human beings to nature conservation through sustainable use. It was directed toward changing the role of humans as one of key drivers for protection, not a cause of environmental

deprivation and pollution. Therefore, the participation of people to manage protected areas started to be valued and demonstrated. This international trend influenced Tanzania as well (Mgaya, 2016). At the same time, the 1980s was the period when the Tanzanian government experienced the lack of economic resources for development, therefore, when the foreign capital investment contained restrictions supporting sustainable development, movement was made toward encouraging “decentralized, community-based approach to forest management” (Mgaya, 2016, P.54).

Finally, this approach started to be adopted officially in the National Forest Policy in 1998 that includes central government and non-state actors, such as the private sector, NGOs and local communities as key actors for the forest management and allowed all Tanzanians to access the natural resources from the forest. Moreover, after experiencing continuous success of some pilot projects funded by foreign donors (Mgaya, 2016), the government established the Forest Act of 2002, which accepted the framework of community-participatory forest management. The Forest Act requested local forest management from the lowest level possible and motivated partnerships of multi-stakeholders as well as permitted all levels of governments, groups and individuals to enter the forest resources (Kalumanga et al., 2018).

Mainstreaming the regional and international agreements and frameworks on environmental conservation has been attempted. Tanzania participated in the “United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro, Brazil, 3 to 14 June 1992, and specifically in “Agenda 21, the Rio Declaration on Environment and Development,” and the Statement of principles for the Sustainable Management of Forests which were adopted by more than 178 Governments at UNCED

(<https://sustainabledevelopment.un.org/outcomedocuments/agenda21>) which underlined the collaboration of economic development and environmental issues (Kilama et al., 2016). However, although there have been numerous changes in policy, these changes have been difficult to put into practice and implementation still remains an issue. Many protected areas in developing countries often have a high level of poverty in the surrounding communities and the livelihoods of communities are heavily dependent on the forests (Mtui, 2014; Fisher& Christopher 2007). Therefore, based on this presentation of historical changes in forest management in Tanzania, this study will analyze the impact of economic and social improvement through the green business approach in the communities under UNESCO Biosphere Reserve program and community based forest management program in Tanzania. .

CHAPTER 4

EAST USAMBARA BIOSPHERE RESERVE (EUBR):

THE PROJECT AREA

1. Environment of the East Usambara Mountains

The East and West Usambara Mountains are located in the northern portion of Tanzania (see Fig. 1) which includes elevations of more than 1500 meters. The area has a high annual rainfall (Stocking and Perking, 1992); with two rainy seasons, from October to December and from March to May, and annual precipitation of 2,262mm. The climate in these mountains is tropical and the average temperature is 25 °C during the warmest months and 16 °C in the coldest. East Usambara Mountains is located between 300 and 1500 meters above sea level. Ancient Crystalline rocks compose East Usambara Mountains, which are dominated by gneiss, granulates and amphibolites. Also, soils of the mountains have pH values between 4 and 6.5 with low fertility (Hokkanen, 2002).

The Eastern Arc Mountains have 13 mountains in the chain and include approximately 3300 km² of coastal and montane forests. East Usambara has the highest rate of endemic flora and fauna per 100km² within total 30,000 sq km biodiversity hotspots (Bolluck, 2013). The species diversity of forests in the East Usambara mountains are the one of the richest in the Africa and tall trees reach up to 65 meters. The

forests in East Usambara mountains were secluded ecologically for more than one million years which provided the habitat of rare flora and fauna for 217 tree species including 50 indigenous ones (Stocking and Perkin, 1992). According to IUCN, East Usambara mountains have “7 butterflies, 27 species, 56 taxa of molluscs, 15 amphibia, 14 lizards, 7 chameleons”, and about 25 to 30 percent of the plant species as endemic species (Stocking and Perkin, 1992). Because of these indigenous species, the importance of East Usambara mountains have been considered and demonstrated through several studies by Rodgers, Homewood (1982), Hamilton and Bensted-Smith (1989) and Schiotz (1981) (P. 341, Stocking and Perkin, 1992).



Figure 4.1. The Scheme of Eastern Arc Mountains

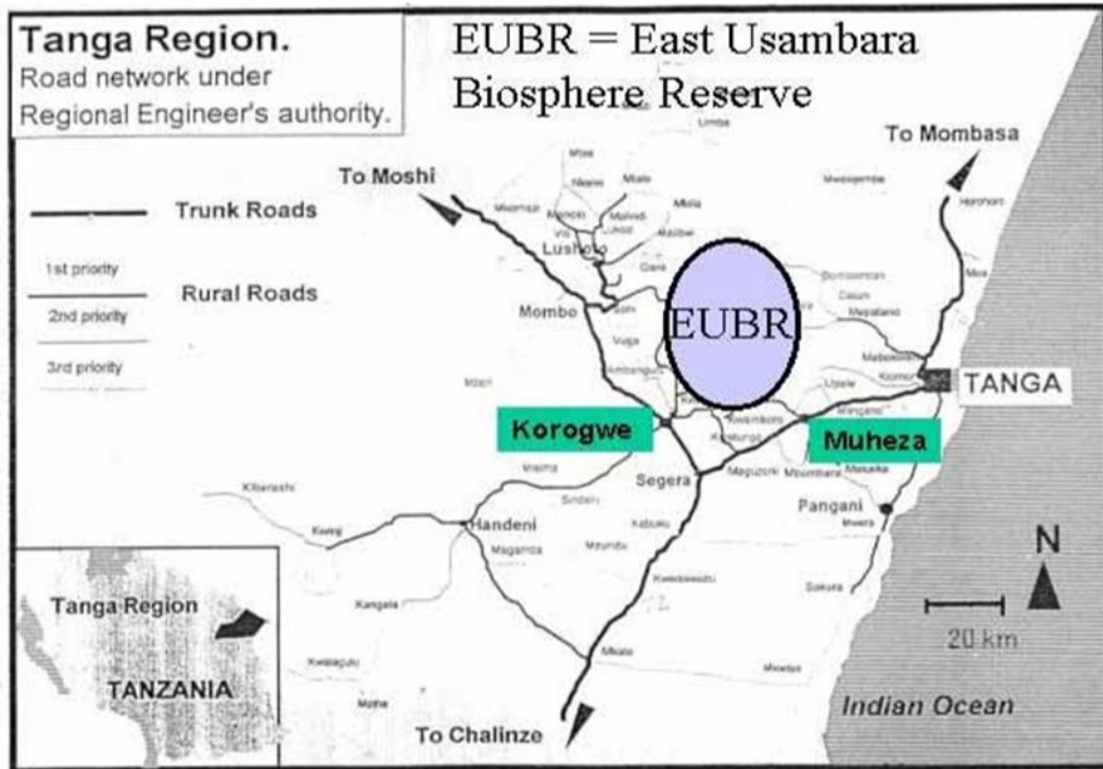


Figure 4.2. Location of EUBR in relation to the Korogwe and Muheza, Mukinga District; Muheza district is now divided by Muheza and Mukinga districts (Hokkanen, 2002;Tanga Regional Engineer's Office's Office)

Though the environmental value of the East Usambara Mountains has been identified, 70% of forest habitat of the remaining Eastern Arc has vanished (Bolluck, 2013) and 13 species are endangered internationally (Hokkanen, 2002). The Eastern Arc mountains have provided habitat to humans since 100CE (Schmidt 1989; Bolluck, 2013) but the anthropogenic influence has grown since the 1960s with clearing of forests for plantations for trees, teas, food and cash crops, estate farming, and conservation initiatives. Even though the conservation efforts were greater in the 1980s than the 1960s, this was more related to the purpose of economic development and the adoption of some promotion such as protection on soil and water and tree planting. With fast population growth, the community surrounding the forest also started to struggle with

low productivity because of the poor quality of soil, too much rainfall, as well as lack of technology for farming (ANR New Management Plan 2009; Bolluck, 2013). Under IUCN Red Data Book, East Usambara Mountains are considered as threatened community. (Hokkanen, 2002).

East Usambara Mountains cover “two Nature Reserves (Amani and Nilo), 12 Forest Reserves (Bamba, Derema, Kambai, Kwamgumi, Segoma, Semdoe, Mtai, Mlinga, Manga, Mlungui, Longuza Teak plantation), four Village Forest Reserves (Kizee, Kizangata, Mfundia, Handei), and two private forests (Magoroto and Kwantili)” (EAMCEF homepage).

2. Social Characters in EUBR

Economically, the forests of EUBR provide firewood as fuel, building poles, 63 medical spices, 16 different types of fruits, the 80 to 90% of cardamoms of Tanzania, cloves, cinnamon, high-value export crops and tea, and water resources from several rivers (Stocking and Perkin, 1992). In other words, the forests provide the most fundamental economic benefits for daily lives of their residents.

(1) Population

According to East Usambara Biosphere Reserve Periodic Review (2015) and based on their sampled survey from total 72 villages that East Usambara Biosphere Reserve (EUBR), the population in EUBR is about 100,300 people with average 6 to 7 family members in one household. The main ethnic groups in this population are the Wasambaa, Wabondei, Wazigua and Wadigo (Hokkanen, 2002).

(2) Education

Among the three districts partially covered by East Usambara Biosphere Reserve, Korogwe district has about 135 primary schools and 12 secondary schools, Muheza and Mkinga districts have about 167 primary schools (Tanga Regional Socio-Economic Profile, 2008) and 46 secondary schools (List of Registered Secondary Schools, 2016).

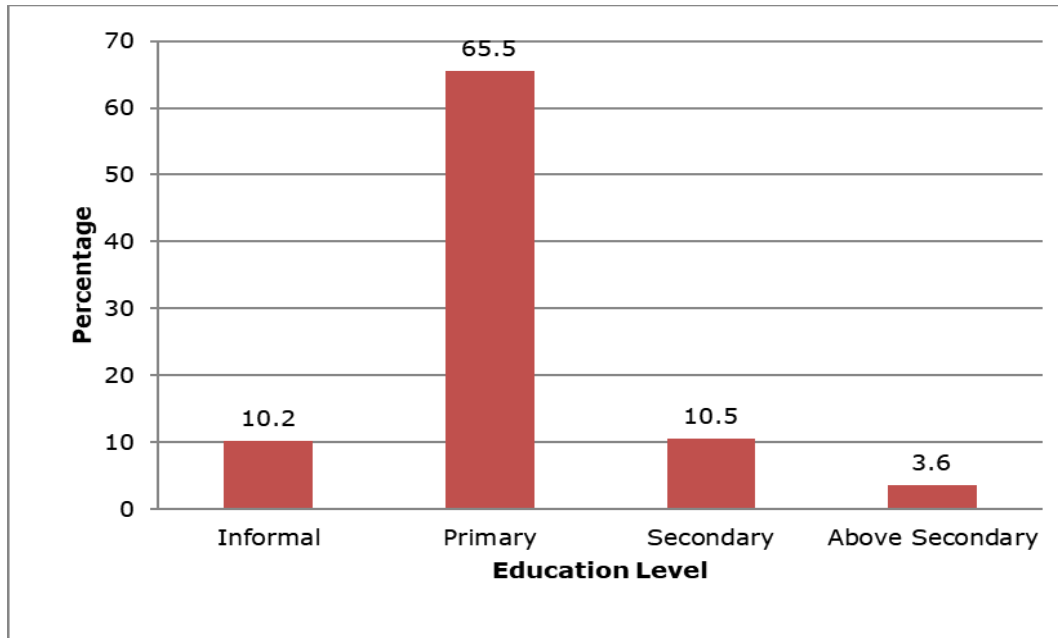


Figure 4.3. Education level of residents in East Usambara Biosphere Reserve (Resource: Stakeholders Mapping and Consultation Report, 2014). (Remaining 10.3% represents those who did not respond to the survey.)

According to the survey of a sample population by East Usambara Biosphere Reserve manager's office, in 2014, the education level is not high. Only 3.5 % of the sample group completed the post-secondary education, 10.5% received secondary education degree and 65.5% have only primary education. The remaining 20.5% either had no formal education or did not answer the survey. One of the reasons for the low education rate is the poverty that makes it difficult for them to pay for education. This

situation causes a vicious circle that low education leads to low income and low standard of living (Stakeholders Mapping and Consultation Report, 2014)

(3) Main Economic Activities and Level of Income Generation

The communities in EUBR are mainly engaged in subsistence agriculture and livestock keeping (Hakkanen, 2002). Selling milk to dairy production companies in the region has also become one of the main livelihoods (Bolluck et al., 2013). The forest in EUBR is protected by law from harvest and activities in the forest, but it has been still providing livelihoods to the communities, such as hunting, medicinal products, firewood, small scale farming, beekeeping, charcoal production, fishing/ fish farming, tea plantation, tree nursery logging, and illegal mining (Hakkanen 2002 and Stakeholders' Mapping and Consultation, 2014).

During the survey (Stakeholder's Mapping and Consultation, 2014), the majority of the activities providing livelihoods (72.7%) are conducted by women and women are leading the income generation in households; however, 65% of decisions are made by men. The sample population in EUBR answered in Stakeholders' Mapping and Consultation that the annual average household's revenue is about Tshs. 165,116 (USD 70 in the rate of 2019) in the range of maximum 200,000 (USD 85 in 2019) and minimum Tshs. 9,000 (USD 4 in 2019), which is much less than the GDP of Tanga based on 2006, Tshs 475,835 (USD 302, Tanga Regional Socio-Economic Profile, 2008).

3. EUBR System

(1) EUBR Nomination Process

For the first time, UNESCO's Biosphere Reserve concept was introduced in 1998 in Amani Nature Reserve Conservation Office which is now East Usambara Biosphere Reserve Management Office as well. Successful results of the "Catchment Forest Project successor, EUCAMP, which combined the East Usambara Catchment Forest Project (EUCFP) and East Usambara Conservation and the Agriculture Development Project (EUCADEP) into one program"(Hakkanen 2002; p.17) fulfilled more easily the application of nomination which was accepted by Korogwe and Muheza Districts (now it is divided by two districts as Muheza and Mkinga) in Tanga Region. UNESCO's International Co-ordinating Council (ICC) recommended the nomination of EUBR due to the unique value of the biodiversity hotspot and the catchment areas in 2000.

(2) Zoning Systems of EUBR

EUBR is the first BRs in Tanzania that adapted zoning systems to enhance the roles of Biosphere Reserve on conservation, development and logistics. The entire size of BR is 83,600 ha that includes 42,100 ha of the forest. Out of the forest area, 30,000 ha is covered in buffer zone, 12,000 ha is within the core zone. The EUBR transition zone consists 39,500 ha for agriculture activity, 4,500 ha for wood based grassland for pastoral activities and residents and 1,100 ha for ponds, rivers and infertile land (Hakkanen 2002)

The function of the core zone is mainly conservation for environmentally significant areas and to protect them from settlements and human activities. The core zone of EUBR is the part of Eastern Arc Biodiversity Hot Spot which needs immediate protection and also includes the most important water supply watershed for Tanga region.

The Buffer zone also plays a role for core zone protection. Therefore, limited human activities and pressure are allowed in the buffer zone and continuous monitoring and research is implemented in the core and buffer zones.

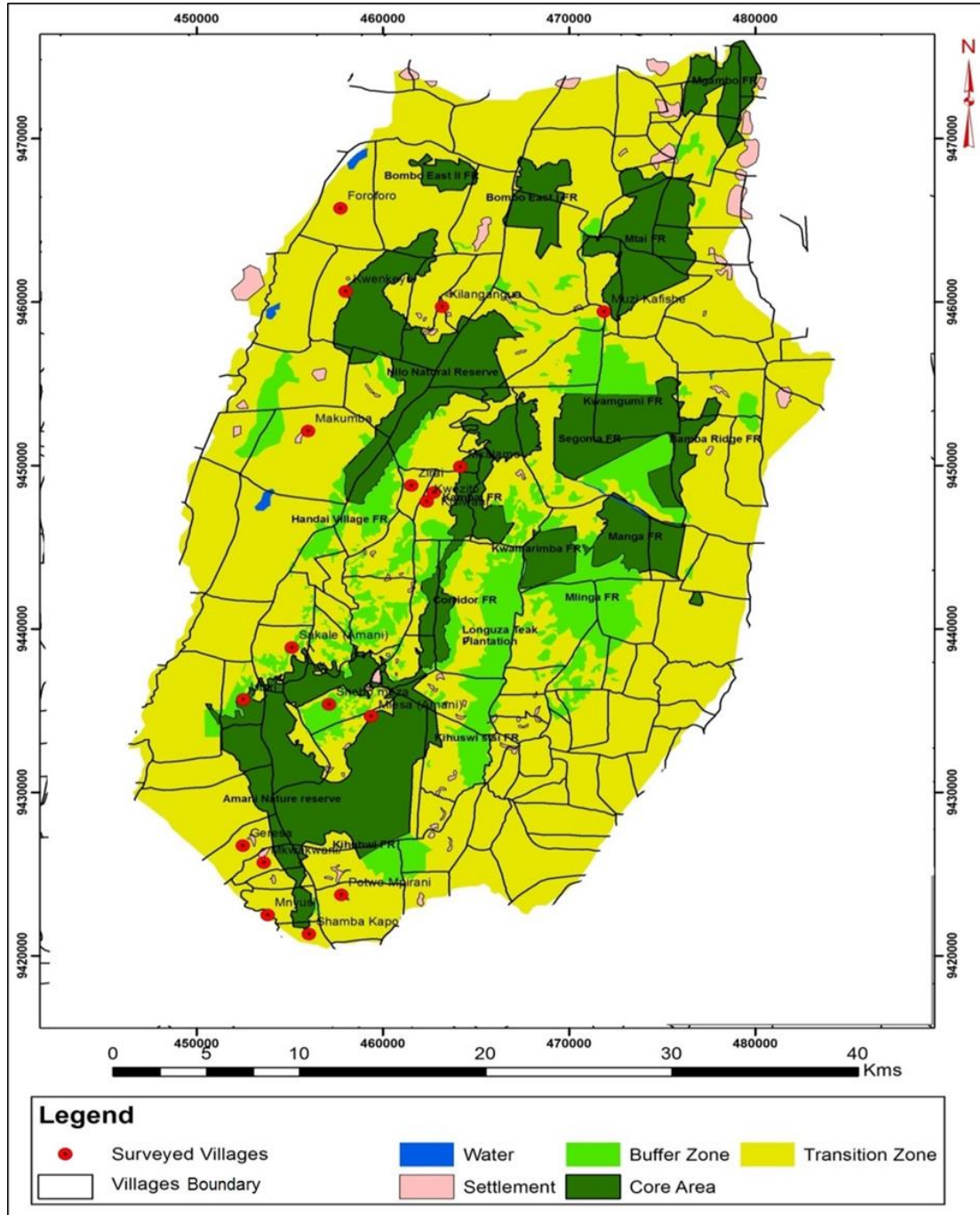


Figure 4.4 The Zoning Systems in EUBR (Resource from EUBR Management Office)

In EUBR, the allocation of population is estimated at 65,000 for the buffer zone and 90,000 for the transition area (Hakkanen, 2002). The total population data, 155,000 in EUBR based on the research of Hakkanen in 2002 is different from the data, 100,348, of East Usambara Biosphere Reserve Periodic Review (2015) due to the different methods each research used different sample population. However, it is still the same that it is not allowed for any residents inside of the core zone. The transition zone has the important function to reinforce the reserves through promoting the sustainable livelihoods in the communities which provides the flexibility of the BR program that makes a linkage between economic development and environmental conservation (Hakkanen, 2002). Also, it is the function that promotes the success of BR management.

4. EUBR and Community Participatory Forest Management

The spirit of EUBR has been built during improvement of community involvement in forest management. East Usambara Conservation Area Management Programme (EUCAMP) started Community Based Forest Management in the area in the middle 1990s, selecting Mtai Forest Reserve and Manga Forest Reserve as pilot places for joint forest management. This experience caused some villages to request to establish a local National Forest Reserve that also encouraged EUCAMP to promote Village Forest Reserve schemes to the communities in East Usambara Mountains. After the first villages formulated a formal Village Forest Reserve such as Mtai Forest Reserve and Manga Forest Reserve, other villages in East Usambara followed to create the Village Forest Reserves in Handei (1995), Kizee(1999), Kizingata and Mfundia (2001). These Village Forest Reserves have two different purposes; (1) for ritual or sacred forest (Mpanga and

Mfundia), and 2) economic affluence oriented purposes (Karambati, Brachylaena, and Hutchinsii) (Hakkanean 2002).

However, these processes did not include or benefit the community participation in forest management until the National Forest Program released a demonstration of Community Based Forest Management Program as one of the main policy strategies in 2001. This program allows the local communities to play a key role through the linkages between sustainable livelihoods with forest natural resources and poverty reduction. According to mid-term review of EUCAMP 2001, EUBR structures were criticized as incomplete process due to the lack of participation from local communities for its formation (Hakkanean 2002). Based on the consideration of MAB program that demonstrates the main role of communities for Biosphere Reserve Management, EUCAMP has linked this concept to their government's policy until the current workplan. However, the function of EUBR for economic development has not been considered enough compared to its function for biodiversity conservation (Hakkanean, 2002). Therefore, the importance of creating a relevant program for implementing the goals and roles of the BR and the management that involve more active participation from communities in and around EUBR, has been demonstrated by sharing essential information about the forest reserves with residents.

CHAPTER 5

LITERATURE REVIEW OF PARTICIPATORY FOREST MANAGEMENT (PFM)

According to Hajjar and Oldekop (2018), there have been much research on Community Forest Management (CFM) after CFM became promoted globally to protect forests, acknowledge the rights of surrounding communities of the forests as well as to reduce poverty in communities. Their study found that there have been two trends of CFM research; examining a type of hybrid business models with enterprises of the community forests and examining the contribution between REDD+ (referring to “Reducing Emissions from Deforestation and forest degradation in Developing countries, and the role of conservation, sustainable management of forests, and enhancement of forest carbon stocks in developing countries”) and CFM. The research on CFM in this thesis is in line with the first trend, since the case study of the thesis is not related to carbon monitoring which is the key objective of REDD+, though the carbon monitoring mostly needs the community participation which can have synergy of implementing REDD+ and CFM at the same time.

Even if the CFM has not been a new research subject, analysis on the community forest enterprises (CFEs) as one of business models has also not been common with two areas to research. Firstly, examining CFEs’ behavior in organizational aspect has focused

on the analysis on the business organization behavior which recently direct the importance of CFEs in business and marketing skills. The second is investigating CFEs financial viability and efficiency through cost-benefit analysis which is one of the most important factors of sustaining and improving the businesses and at the same time the most difficult factor to have (Hajjar and Oldekop, 2018).

In this chapter, the literature reviews will present the discussion on Participatory Forest Management (PFM), primarily Community Based Forest Management (CBFM) in Africa, and particularly the forest management implemented in Tanzania. It will narrow down to the targeted area, East Usambara Biosphere Reserve, for Green Economy in Biosphere Reserve project. In this process, how the Biosphere Reserve program and participatory forest management support each other's implementation will be observed. Also, the literature review will present how livelihood development approaches towards the surrounding communities of the forests have been implemented and their success and failures. This presentation will show why the mindset of entrepreneurship is important not only for livelihood improvement but also PFM and BR. Through presentation of the literature reviews, this paper will try to justify the important components that should be strongly demonstrated during the implementation of PFM and BR.

1. Participatory Forest Management Discussion in Africa

The massive loss of forest, 1 million ha per year, and emerged international environmentalism with the Rio Declaration in 1992, have influenced the changes in the new forest laws in approximately 35 countries in Africa, since 1990. The most common contexts changed are: increased requirement for national and private forest planning;

national forest properties became legally stronger controlled; private sector roles were legally encouraged; and central forest administration involved more inputs from civil society for decision making as well as decentralization for local governments. These changes in the legal systems allowed forest-local populations to manage forests more directly through the participatory aspect (Wily, 2002).

In Africa, the first successful CBFM was piloted in 1983 by the Cooperative League of the United States of America by creating a cooperative to produce firewood and hay for communities around Guessebodi National Forest (Heerman et al. 1986; Polansky, 2003) and addressing three objectives such as including nearby forest communities in the management, creating forest legislation that involved village groups and stakeholders in the management and establishing a long-term, 10-year management plan that covers the communities' harvesting and regeneration of natural vegetation.

Polansky (2003) sees that the main reason of the success of the first CBFM was the long-term management plan for CBFM which was based on deforestation caused by the growth of population and their need for livelihood activities such as pastureland, arable land, and fuelwood. This long-term management plan supports the sustainability of CBFM as well. However, the long-term management plans and its implementation experience are deficient for the mass timber or agricultural production that cause the massive deforestation during the period from 1960s to early 2000s.

A workshop was held in Tanzania in early 2002 and brought practitioners of Participatory Forest Management (PFM) from 25 African countries together with donors and other interested organizations. The workshop suggested several key issues for PFM based on the experience during approximately two decades, such as "1) Locals are

important players in the wise use and conservation of remaining timber in Africa, 2) Granting land ownership is only one way to transfer powers and obtain participatory management, 3) Community empowerment and management skills cannot be secured within the short life of a donor project, 4) ‘Villages’ are not the same as ‘communities’; and they are not always permanent entities interested in maintaining forest cover, 5) Villagers are as corruptible as forester officers, 6) Inventories and harvesting plans are necessary components of management plans if sustainable exploitation and benefit sharing are to be realized, 7) Management plans do not need to be set in cement before approval, 8) Inventories do not need to be prohibitively expensive, 9) Government forest departments are still relevant in PFM” (Polansky, 2003).

The results from the workshop suggested solutions for these situations through demonstrations on the role of management. Management plans in Africa may be simpler and shorter than those developed for the Western nations and may highlight the roles of the local as wise users and conservators of the forest. When locals are granted land ownership, they have a stronger incentive to participate in participatory management. Moreover, the workshop found that the solutions should be based on concepts such as building legislation and natural ecology and community empowerment. (Polansky, 2003)

Odera (2004) assessed the discussion on CBFM from 1980s to 1990s, defining qualifications of the CBFM with local stakeholders’ involvement in differently named types of CBFMs such as “community forestry, social forestry, common property forest management, collaborative forest management, joint forest management and participatory forest management” (Wily, 2000; Odera, 2004) . The studies on CBFM during the 1990s show the practice and benefits of the usage of forest resources for the surrounding

communities such as trees and forest products to meet their basic needs and livelihood, are the key roles of CBFM. Therefore, the improvement in forest natural resource management is the solution for deforestation (Arnold, 1992 and 1995; Odera, 2004). The results of these studies were based on the policies, frameworks, community institutions, tenure regimes and markets as well as forest management know-how and strong relationships between the locals and forest service (Colchester et al., 2003; Odera, 2004).

However, the CBFM has been presented differently to communities, depending on the different level of the local's forest ownership. Since the ownership causes diverse arrays of the roles of participation and decision-making in CBFM in many countries, various forms of agreements for management exist between the local communities and their partners; "Leases, Consultation, Co-management, Contracts, Consigned management" (Wily, 2002; Odera, 2004). In Africa, the structures of CBFM have been from government's or NGOs' top-down intervention and small forest-user groups to fully owned community forests (Wily and Monela, 1999; Odera, 2004). It has been shown that when CBFM relies on those who do not have an interest in the forest, that the natural resources are more accessible to the outsiders and the outsiders are more likely to destroy the forests as they have no long term interest in its sustainability. (Ostrom, 1992; Odera, 2004).

CBFM is also often combined with income-generation activities such as forest products, mushroom farming, ecotourism, beekeeping, and bush meat trading (Odera, 2004). This not only increases income revenue through CBFM implementation, but also, CBFM has created law enforcement for the villagers and government officials around the forests through applying the policies in the systems and, therefore, improves the capacity

of the communities (Kajembe et al., 2003; Odera, 2004). Many countries have experienced that within less than 10 years, CBFM can strengthen the state-community relationships and increase the forest cover as well as ecosystem and wildlife habitat (Odera, 2004).

Wily (2002) analyzed the Participatory Forest Management (PFM) in Africa and highlighted the failures of forest management during the twentieth-century. As Odera (2004) mentioned, PFM is considered as a kind of CBFM. In Wily's analysis (2002), the successful contributions of PFM were diverse in multi-levels especially, when forests, communities and local governments around the forests moved forward democratization by empowering all these levels.

According to Wily (2002), PFM transferred the social status of poor forest-local populations from minor beneficiaries to owners of livelihood of the forest resources for the long-term, covering the most remote and poorest rural populations in the forest. In 20 African states, the trend of PFM promoted the public properties through community forest demarcation, instead of opening the forest for everyone including people from outside of the communities surrounding the forest and securing land rights not only for the protected forest but also for unreserved forests. Through this PFM practice, many countries in Africa have been able to also exercise democratization in the grassroots level in collaboration with conventional local governments such as districts, learning by doing (Wily, 2002).

The practice of democracy through CBFM in Africa was based on systematic management strategies. The most significant strategy is benefit sharing which can be the most strong motivation for CBFM but at the same time, can be worse for economic and

social status between the poor and the rich in communities in forests. Basically, benefit sharing means that the forest access and its revenue as well as the power of controlling the forest is shared, which reduces the burden of forest conservation and management for the government. Sharing revenue from income generation activities in the forests such as logging, and hunting, motivates and appeals to communities to participate in CBFM as support for economic development for the communities. However, in some countries, the private sectors from outside of the forests still have the authorizations for production and marketing of the forest products (Ribot, 2001; Wily, 2002).

Benefit-sharing is also secured for the communities when the managerial power for the forest products and activities is used for income generation. Wily (2002) uses a common definition for a community as a population which has interest as users of forest resources, but not as a part of the forest and local community, which causes issues on power-sharing due to communities' limited rights of use for forest resources. Therefore, a demonstration on strengthening the management power to the local population can only guarantee the local-level participation.

The most current study about the characteristics of CBFM in Sub-Saharan Africa and its contribution to Sustainable Development was conducted by Duguma et al (2018). The study sees one of the motivations of CBFM implementation as the support from the model of decentralized resource management models of World Bank and the International Monetary Fund (Anderson, 2000; Olowu 2001; Ndegwa 2002, Degrassi 2003, Sarin et al. 2003; Larson 2005; Duguma et al., 2018). CBFM has been one of the suggested measures for any forest management which includes community participation for this decentralized management model for the forestry sector considering its

contribution to social and economic benefits in the local communities and the UN sustainable development goals; “Goal 1, poverty reduction; Goal 2, food security; Goal 3, well-being; Goal 13, climate change; and Goal 15, forest and biodiversity conservation”(Druguma et al., 2018). In all five countries (Ethiopia, Kenya, Uganda, Tanzania, and Cameroon), these Sustainable Development Goals (SDGs) have been partially achieved at different levels.

The primary impediments to achieving the SDGs through CBFM, are the unequal distribution of benefits from forests, lack of capacity for predict management, and weakness of CBFM frameworks. Therefore, the study (Duguma et al., 2018)recommended targeted areas to improve CBFM, such as improvement in transparency and accountability, market linkage, adding value on forest products and an equitable rewarding mechanism for participants from the communities.

Based on these studies about PFM in Africa for the last two decades, though they have slightly different points highlighted for improvement of PFM, the lessons and way-forwards for success in Africa are how PFM can motivate communities surrounding the forests to be more actively involved in the management and the importance of the community capacity to be involved in PFM. Because of the lack of experience of democratization at the grassroots level, implementing policies, and long-term strategies of policies as well as entrepreneurship towards the products from the forest have influenced PFM as weakness. However, the hope is that the practice and development of PFM would improve local democracy and the community participation for decision making in forest management and the use of natural resources, expecting a high level of policy development, and the implementation of PFM in democracy as well.

2. Participatory Forest Management (PFM) in Tanzania

PFM has two main forms in Tanzania; Joint Forest Management (JFM) whereby the forest is owned by the central government or district council and the local people are involved in conservation of the forest, and Community Based Forest Management (CBFM) whereby the community is given the right to own and use the forest that is on the general land. The Tanzanian government classified three types of forest protected areas, including village land forest reserve (VLFR) backed up by Village Land Act 1999, joint managed forest areas, and Community Forest Reserves (CFR) (Duguma, 2018).

CFRs and VLFRs are promoted by CBFM and Joint Managed Forest (JFM). Except for the government's arranged national reserves, most of the forests in Tanzania are managed as CBFM and the national reserves managed by JFM. According to Tanzania government in 2011, 409 forest village reserves which have CBFM implementation, are on-going. Among them, 71 are gazette, which means that this land is removed from the residents of the land for selling and buying. Moreover, it is limited to be sold to the people or communities in the land and to be bought only with the signature of the communities or the head of the land (URT, 2011; Duguma et al., 2018).

Tanzania has been considered as a country which has one of the most advanced PFM, compared to the other African countries. PFM has been expanded to 2285 villages, which is one fifth of Tanzanian villages according to the Ministry of Natural Resource and Tourism (MNRT) in Tanzania, 2012 (Gross-Camp, 2017). The PFM is legally supported by Forest Policy of 1998, the Forest Act 2002, Forest Regulations 2004, the Local Government Act 1982, and the Village Land Act 1999 (Duguma et al., 2018) as well as by external funds from national and international organizations. Several studies

recognized positive impacts of PFM on the environment of the forest in terms of improvement of forest coverage (Blomley and Ramadhani, 2006) and reduction on uncontrolled exploitations (Mwambo et al, 2012 and Dugama et al, 2018).

(1) Livelihoods and PFM

Nzuda et al (2011) described the major roles of village government for CBFM within the community surrounding the forest based on the CBFM experience in Tanzania. For instance, the village council controls the demarcation and allocation of the land for conservation and personal ownership. The most important three roles of the community for forest management are 1) manager as owner with the least supervision offered, 2) involving more communities to take responsibilities for the forest affairs with the least government operation, 3) creating collaboration between communities and government for the forest management. The study sees that the government's role is still required for some commercial plantations, but too much government involvement for the forest management may not be sustainable. Even for the Participatory Forest Management (PFM), which has more space for government's engagement compared to CBFM on multiple levels of follower, encourager or leader, equity is a necessary factor for successful PFM for the local community to gain the power of decision making and for the benefit-sharing.

In the demonstration of the community roles for CBFM, empowerment of community capacity is required through improving technological knowledge, literacy and financial literacy for their livelihood activities and forest management. Most of communities in Tanzania for CBFM have been struggling with the low capacity which causes them to be dependent on external experts or community members who have more

education and leadership position. In other words, this situation ends up with having unequal opportunity and benefit sharing issues in the communities (Nzuda et al., 2011). Duguma et al. (2018) also insisted on the importance of unequal benefit share that usually the elite in communities lacks the motivation to participation and involvement of decision making in the forest management. Therefore, the capacity building of community is strongly recommended.

Even though Persha and Meshack (2015) pointed out that JFM in Tanzania had no impact in deforestation (Dugama et al, 2018), they indicated the benefits of PFM for the natural resource management of local government and economic development through the assessment on income and assets. However, Gross-camp sees that JFM has not replicated properly more subjective aspects of the local communities such as the opinions from the participants towards PFM policies and its impacts on their lives. (Gross-camp, 2017). Moreover, PFM can be manipulated to promote overharvesting if PFM provides too few products that do not satisfy the local demand and if the local agricultural activities clear the forests to turn them into farms. (Treue et al., 2014). Therefore, it is important to have a balanced assessment of objective and subjective indicators to describe the influence of PFM on the well-being of the communities.

Another study (Lokina and Robinson, 2017) focuses on the Participatory Forest Management (PFM) in Tanzania and recognizes that PFM has an issue with the reduction of access to forest resource. However, the study highlighted that when the forest protection is strongly relevant to economic benefits through livelihoods, the benefits are equally as great as the costs for the conservation and the benefits are equally shared and distributed evenly to the communities, PFM would be more attractive for the locals. The

study also insists that the forest protection, livelihoods improvement, and conflict reduction all should go together for sustainability and equitability.

The assessment of Gross-camp (2017) presents the strong connection between social benefits and the implementation of CBFM in a more holistic manner, but it is not clearly mentioned whether these social benefits would help forest conservation. Since even though the communities feel their pride of the forest as owners, their access to the forest has not always resulted in the environmentally friendly outcome.

Downie and Dearden (2017) discussed the relationship between livelihood improvement and conservation. They criticized that there has not been enough investigation on how participants make decisions on livelihood strategies in nature. Active community participation in decision-making is critical because its progress and priority on the different levels of conservation influence the choice of livelihoods. The perceptions from the people toward climate change has made an impact on decision-making for livelihoods. The study found that the perception of communities to access the natural resources clearly indicates the changes of productivity and income depending on environmental conditions. (Downie and Dearden, 2017). This recognition from the communities surrounding the forest is very meaningful, since it means they have capacity to link the plan for livelihoods to the environmental issues which demonstrate the communities' involvement in the forest management is essential.

Focusing on CBFM, Gross-camp (2017) found how the communities consider their participation in CBFM. They see that CBFM allows them to obtain access and increase the value of the natural resources of the forest, to control the forest directly as their own property and to sense the pride of having ownership toward the forest. This

study showed that the local community needs should be originated by understanding the community's subjective aspect on CBFM and at the same time the capacity of the community must be improved to understand the legal process of CBFM without external support to establish CBFM.

(2) Forest Ownership and PFM

In the previous study of Polansky (2003) for PFM cases in Loshotu Reserve in West Usambara Mountain, Tanzania, the community ownership towards the forest was shown that it sometimes does not work to improve their livelihoods and forest management. The participants from communities recognized that the role of government to protecting the nature with laws and regulation for land use to avoid uncontrolled exploitation when the forest becomes the open area to the public. Therefore, without the agreement for forest management between the government and the local, it would be difficult to support each other for further forest protection (Polansky, 2003). However, this aspect would come from the assessment on the case of JFM with communities which have less land rights and less experience with participation for the forest management than the communities of CBFM do. Still it is meaningful that this recognition demonstrates Gross-camp's point of the strong need for capacity building in the communities for the forest management to support PFM.

Strong land ownership by individuals in Tanzania is supported legally from the government and supports advanced JFM (Wily, 2002). According to Wily (2002), it is important to empower communities to define the forest and formalize the sustainable management plans for unreserved forests owned locally. Only in Tanzania were the communities guaranteed to have local rights legally and this management style became

owner-manager of the community forest. This situation legally empowered the communities for JFM, however, this legal support did not result in the increase of communities' participation in the forest management. In Tanzania, the forest use has been more related to custodial and managerial roles than the use rights under agreements. Also, its focus has been on more jurisdiction and tenure than access. As a result of these issues, the local forest managers have created rules to use the forest, but not to conserve (Wily, 2002). Additionally, some researchers have shown the tendency of CBFM of JFM has better forest conditions comparing to non-PFM and communal forests have less illegal harvesting than national Forest Reserve (Persha and Blomley 2009; Treue et al, 2014). These results were originated by the stronger tenure security supported by Tanzania law and regulation related to PFM approach through communities' forest management.

(3) Different Level of Ownership, Participation and Benefit-Sharing

For participation, sharing the power to make decisions could be the best motivation for the communities. Godman (2003) insisted that the local knowledge for nature management is valuable and practical, but this has not been properly reflected in the forest management for the purpose of exact measurement, calculation and logistics, conducted by conservation organizations, usually official and international conservation NGOs and powerful actors (Godman, 2003) In addition, Wily (2002) indicated the lack of recognition of the impact of sociopolitical climate and democratization in Africa lead its lack of experience for resource and social management as well as new government laws for environmental protection.

Mascia and Mills (2018) applied theory of diffusion in environmental conservation and management in Tanzania, which is how innovation is adopted by different levels of organizations and individuals in environmental conservation, to examine the dynamics of conservation interventions in Tanzania through the process of adoption and environmental creativities. They expect that the study can provide suggestions to improve environmental conservation capacity of donors and implementers to make longer impacts with less costs, through analysis of innovation adaptation in terms of different characters of institutions and individuals and socio-ecological situations of adopters.

This study sees that Tanzania has three types of systems for environmental interventions, CBFM, JFM and Wildlife Management Areas (WMAs) in 1998. In this paper, all three interventions are considered under participatory based environmental management, but they have differences in terms of the level of community participation, and government intervention in the process, as well as the target of conservation. The study of Mascia and Mills (2018) found that CBFM gives the highest right and control based on the strongest ownership of the forest followed by JFM and WMAs.

CBFM and JFM are backed by Tanzania's Forest Policy (UTR 1998). CBFM is implemented in the village or on privately owned land while JFM is usually reserved and under government ownership and management. Therefore, any benefits and costs created, and decision-making, are shared fully in CBFM but often inequitably shared between the state and the communities in JFM. WMAs are supported by the Wildlife Policy of Tanzania (1998), managed by a combination of organizations including locals, government, NGOs, and the private tourism sector, however, the land is owned by the

communities. Due to this complexity between land rights and the joint management, the villagers experiencing WMAs often do not recognize the benefits and decision-making is shared equally but charged in costs. Table 1 shows the differences of the three environmental interventions.

Table5.1. Characteristics of the Innovation (Reshaped table from P.6 for only Tanzania’s case, Mascia and Mills, 2018)

Characteristics of the innovation	CBFM	JFM	WMA
Relative advantage	O	O	-
Compatibility	+		-
Complexity	O	O	-
Trialability	-	-	-
Observability	O		
Flexibility	+	O	-
Characteristics of the actors			
Existing knowledge	O	O	
Nature of social-ecological system			
Geographic proximity			
Political Conditions-enabling policies	+	+	O
Technical assistance	+	+	
Political conditions-bureaucratic barriers	-	-	-

+ represents case-specific condition that facilitated adoption
O represents case-specific conditions for which there is contradicting evidence regarding whether conditions facilitated or hindered adoption
– represents case-specific conditions that hindered adoption
blank represents variables for which no information is available.

In two protected areas, the Amarakaeri Communal reserve in Peru and the Selous Game Reserve in Tanzania, differences were identified in terms of community participation even though they are similarly situated institutions. However, the difference did not originate with economic benefits. Peru's case was motivated by political gain such as land rights while the communities in Tanzania were not positive with participation (Haller et al., 2008) According to the studies (Gudeman, 1982 and McCloskey, 2001, some of the positions taken by local actors cannot be explained by a simple cost-benefit analysis: "A cost-benefit analysis approach would lead us to expect that in both settings we have studied because of less gains, local different actors would be against conservation in Wildlife Protected Areas (WMA)." Since WMA is not under forest protection and management, it is different from CBFM, however, it is still meaningful to see why communities in WMA were frustrated having management systems and benefits from livelihoods such as tourism (Haller et al., 2008)

Sachedina and Nelson (2010) introduce four tactics of wildlife conservation, which grant local economic benefits and incentives; 1) "Outreach and benefit-sharing efforts by Tarangire National Park authorities," 2) trophy hunting concession holders' contribution to the communities, 3) contract creation for village-private tourism collaboration, and 4) "direct payment scheme," in Massai Steppe, which has less than 15% as protected areas managed by Tanzania National Parks (TANAPA). The study found that the passive benefit-sharing approaches were less influential to motivate the communities for participation in wildlife conservation compared to more straightforward approaches. For example, direct conditional payment approach was successful to motivate the community participation in conservation. However, the mainly economic

benefits-oriented community-based conservation is not always oriented to environmental conservation. Therefore, it is important to have straightforward negotiation and agreement among interests from the public, the private and the local for community-based conservation, supporting direct incentives (Sachedina and Nexson, 2010).

Based on these findings, the study suggests that the value of the importance of the level of involvement of adopters and outsiders of the reserved areas, including government and the conservation offices, should be catalyzed in the different range of social science-based planning, design and implementation.

(4) History of PFM in Project Areas

Amani Nature Reserves (ANR) in East Usambara mountain (EUM) is a part of the project area; however, it is one of the most important core zones of East Usambara Biosphere Reserve. It was legally claimed as protected forest areas in 1997 as one of the first participatory conservation areas. Under the government's zoning systems, it has a bio-diversity preservation zone (77% of ANR), and a local use zone (6%). The rest is a buffer zone for the purpose to practice use of the sustainable land and natural resources and reduce the strong dependency on environmental resources of the communities surrounding ANR (ANR General Management Plan, 1998; Vihemäki, 2005).

ANR's PFM was originated by International Union for Conservation of Nature (IUCN) through various biophysical studies in the mid-1980's under two conservation projects funded by two donors; EUCADEP (East Usambara Conservation and Agricultural Development Project) which focused on public land working with communities and the East Usambara Catchment Forest Project (EUCFP) initially focused on reserved forests. These programs were supported by the Ministry of

Agriculture, and Livestock Development and funded by the European Economic Community/European Community (Vihemäki, 2005).

Applying “the conservation-based rural development,” IUCN’s new approach influenced by the World Conservation Strategy (Stocking and Perkin, 1992; Vihemäki, 2005), from 1998 to 2002, EUCADEP and EUCFP were combined under the new name of EUCAMP with new donation from the Government of Finland, the EU and Tanzanian government to harmonize the protection of bio-diversity and local needs as a long-term goal. During this time, the program became a framework to increase the forest reserves from about 17,000 ha to 30,000 ha and to practice JFM through improving the working relationship between communities and government officials to resolve some illegal pit-sawing activities and introducing “income generation activities, environmental education and farm-forestry” (Vihemäki, 2005).

Later on, PFM was officially applied and adopted in ANR with JFM solutions (government and communities co-management for state owned forests) and CBFM. Most of the forests in the EUM are the government’s forest reserve under the direct management of Forest and Beekeeping Division (FBD) of Ministry of Natural Resource and Management and mainly managed by JFM. Especially in the buffer zones, the communities and the government created agreements on the rights and responsibility on the natural resource access and management, such as collecting firewood and medicinal plants twice a week under permission and the villagers’ receiving 20% of entrance fees and research fees which were paid to ANR. Many villages established an Environmental Committee or Forest Committees (EC) and they assisted village government to protect core and buffer zones through increasing and participating in conservation projects.

However, as it was mentioned, as issues in overall PFM in Tanzania, ANR also struggled with inequal benefit sharing by higher social positions and promised compensation was not distributed to the women and the poor (Vihemäki, 2005).

To resolve these common issues of PFM in Tanzania, Duguma et al.(2018) suggested concentrating on 1) community capacity building, 2) forest type allocation for community's improvement in line with biodiversity and climate change impact, 3) developing a fair share between communities and government to be responsible on the forest conservation, 4) community empowerment for decision making, 5) seed money funding for communities' small business startups, and 6) division on the management strategies to reduce elite capture issues through stronger collaboration with other community members. This thesis direction is well matched with suggestions 1, 4 and 6 which the Green Economy in East Usambara Biosphere Reserve project was able to evaluate. However, due to timing and funding issues, the other suggestions were not evaluated as part of this study.

3. Biosphere Reserve Program in Synergy with PFM

(1) The Importance of Community Participation in Biosphere Reserve

Program

UNESCO Biosphere Reserve (BR) Program has a longer history as a methodology for protected area management than CFM. The concept of the BR program was established in 1970s, endorsed by the Brundtland Report from Brundtland Commission which is known as also World Commission for Environment and Development in 1987 and Australia's ESD Strategy in 1992. The program faced

implementation problems initially due to too much concentration on promoting World Heritage Sites in UNESCO and the complexity of the concept failed to appeal to science and policy sectors. Additionally, for the first decade of its creation before the Seville Strategy (1995) was included as its management strategy, most nominated BRs were managed as special national parks which concentrate on only one function, to protect core areas. Even for the recent BRs, most of them are public land that does not allow the locals to be included in ownership and responsibility for the protected areas and they lack experience on the practical implementation of an organizational framework (Brunckhorst, 1999).

The communities around BRs have gained a better understanding of the value of the BR program such as ‘ecologically sustainable development’ and the integrated management of landscape ecosystems on a regional scale. Also, the international BR network has expanded and been recognized as the foundation for the future activities to reflect the UNCED (United Nations Conference on Environment and Development) implementation, such as Agenda 21 (Brunckhorst, 1999).

However, after adding the components for long-term biodiversity protection to be in harmony with natural resource utilization through the Seville Strategy, the traditional approach of BR programs has the following objectives; “1) local community participation, 2) integrated land use management, 3) conservation and restoration, 4) research, 5) monitoring, 6) regional planning and development, 7) environmental education & training, 8) ecologically sustainable development, 9) information and communication, 10) developing an international network” (Brunckhorst, 1999).

According to Brunkhorst's analysis of these objectives of the BR program, the program has been reinforced through not only the conservation process of natural values in ecosystem, but also the integration of cultural needs and characters and the improvement of the life standard of the local. Its importance of reflecting cultural values of the local community is also considered in the aspect that sees BR reserves as bioregional planning at a local level (Noss, 1993, Brunkhorst & Bridgewater 1994, 1995, Reid & Murphy 1995; Brunkhorst, 1999) and as a drive to create public-private cooperation to reach the goals such as sustainable resource use, and conservation for sustainable development considering the improvement in livelihood (UNESCO 1984, 1995, Kellert 1986, Ishwaren 1992, Parker 1993; Brunkhorst. 1999).

As a people-centered model for sustainable development which considers economic and social development as well as environmental protection, the BR program has a solid function for implementing these three pillars based on the interaction between human and environment including intensive ecosystem studies through biodiversity conservation, covering local and community development (Schaaf, 2009). Even though there has been a difficulty of implementation of this BR program expressed by most BR managers due to the lack of human, financial and technical resources, the most critical management driver originated from the relationship between government and local agencies for environmental conservation and the local communities. Therefore, this philosophy of BR program can be demonstrated by Community Based Natural Resource Management (CBNRM), as the community participation is the key strategy and concept of BR (Sotll-Kleemann, 2010).

Moreover, within the BRs in the World Network of BRs, mountain biodiversity has accounted for about 40% of the total biodiversity (Schaaf, 2009). In other words, Community Forest Management (CFM) also insists and supports the philosophy of the BR program for mountain areas. For instance, UNESCO-MAB has promoted a project, 'Global Climate Change in Mountain Sites (GLOCHAMOST)' which aims at the collaboration and exchange of Mountain scholars, BR managers and communities around Mountain areas for their management and knowledge sharing (Schaaf, 2009).

BRs are not bonded legally so this allows different approaches for the management, reflecting cultural, social, environmental and economic standards and situations, though, at the same time, this situation shows that many countries do not have the experience to apply the BR program under their own guidance and its implementation. Given the structure, the local people are necessarily the main drivers for implementation of the BR program, since their actions influence in both ruining ecosystems and protecting them. Also, the partnership among communities, the private sector and government agencies could provide synergy for increased professional capacities and increase the diversity of the resource (Brunkhorst, 1999).

(2) Community Participation Motivated by Using Local Institutions and Traditional Knowledge

Firtz-Vietta et al.(2009) and Pulido and Cuevas-Cardona (2013) show community engagement on BR management through using culture of the region such as locally-based organizations and customary institutions and indigenous knowledge to use natural resources. According to Firtz-Vietta et al. (2009), Madagascar has much experience to implement policies based on delegating the management to the local associations and

institutions to use the natural resources which led the country to move to take the CFM based management.

In the study of Firtz-Vietta et al. (2009), the most important factor for mobilizing the local participation is through reflecting the needs and objectives of local associations and their rangers and management staff with capacity building such as regular training. Even if the law guaranteed the right of using natural resources for the surrounding communities of BR, it was not easy to implement the policies with the community participation. The resolution originated from the aspect of valuing their cultural relations within the family, relatives and friends, local leaders and customary and informal associations and institutions. Patnam (2000) explained this as building social relations through three distinguished categories such as bonding (ties among between individuals), bridging (collaboration between local associations), and linking social capital (relations with vertical level such as power structures) (High et al., 2005; Firtz-Vietta et al., 2009).

As an example of reflecting the cultural organizations by connecting them with the modern BR management structure in the study of Firtz-Vietta et al. (2009), the legal entity, such as associations called COBA in Mananara BR and CLB in Sahamalaza BR, established by the locals to deal with any agreement with government or other stakeholders and to represent the community as well as unifying actions for common interests and code of life. Adding to these associations in the community, the local informal institution such as “Dina” (local language) takes into account traditional and oral code of the relationship among communities and provides and reflects customary rules and regulation for using natural resources and management. Traditionally, Dina has covered a wide range of issues in the local communities and delivered security for the

land, guaranteeing the access to and the practice of its use of the land and the natural resource. Its management plans and documents were harmonized in the control mechanism with the modern management structure, having responsibilities to control and monitor the activities of the associations, COBA and CLB. Moreover, traditional hierarchies such as royal family, the Ampanjaka in Sahamalaza, reinforced environmental protection through raising the local respect towards the tradition and custom with their power (Firtz-Vietta et al., 2009).

It is very important to pay attention on traditional systems within the communities in BRs to be linked with state laws and modernized legal systems. It is necessary to motivate participation of communities for BR management and to match the purpose of BR. Obviously, the structure this paper focuses on is informal structure. In other words, it is based more on their culture, custom and traditions as well as the mindset people have in the field. To adopt their culture and customs, just linking the traditional systems to the modern systems is not enough even if it is necessary for both of them to support and respect each other.

Pulido and Cuevas-Cardona (2013) insist how indigenous knowledge encourages the community participation in the management of Barranca de Metztitlán Biosphere Reserve (RBBM) in Mexico as an ideal example of the solution for complex environmental issues by using local knowledge. Under BR program's conservation strategy which is making harmonization between human beings and the ecosystems, there has been demand for the new conservation paradigm. Socio-ecosystem is one of the aspects to see the environment as a complex system that requests the participative approach from multiple levels' decision making to make the balance between

environmental conservation and human life development in the management.(Berkes 2003; Berks and Turner 2006; Campbell and Vainio 2003; Pulido and Cuevas-Cardona, 2013). In this aspect, it is necessary to consider local knowledge which has been used for a long time to motivate the communities to take roles as the manager, the owners and the users of the natural resources in BRs. Many studies insist the solid role of local knowledge can provide solutions for many current environmental problems through reconnecting communities' profound and long-time relationship and accrued knowledge with surrounding nature (Bowler 2000; Toledo 2002; Funtowicz and Marchi 2003; Leff 2005; Berk and Turner 2006; Boege 2010; Pulido and Cuevas-Cardona 2013).

Maintaining and practicing the local knowledge in modern BR management system is not simple since it should be based the complex interactions among the local, institutions and external stakeholders. A successful case study using local knowledge for BR management in Mexico, is based on the strong support from the government institutions such as CONAFOR (National Forest Commission) and CONANP (National Commission of Natural Protected Areas) and the simple and useful context of the training of using the local knowledge for cactus production, which can be easily applied to and combined in a beneficiaries' own daily methods (Pulido and Cuevas-Cardona 2013).

The local knowledge was transferred to communities from the Flores brothers (San Cristobal nursery) whose father taught the government officials and administrators about BR cactus management which includes time of seeding and harvesting, name of the local cactus species, harvesting seeds from the wild cactus for nursery and so on. These trainings and workshops were also taught by technicians from the national and state universities of Mexico which had modern knowledge of cactus management. The

communities, surrounding the BR, became strongly motivated to be engaged in BR management through cactus conservation with accessible and familiar local knowledge which is exchanged and improved by advanced modern technology and direct the communities to increase the profits from cactus nursery. While they manage the cactus nursery business, they noticed that their activities for cactus conservation was linked to BR conservation and income generation and reduced by 80% the illegal cactus extraction. Therefore, the community recognized the importance of BR conservation for their livelihood as well (Pulido and Cuevas-Cardona, 2013).

(3) Motivating Community Participation through Empowering Communities Surrounding BRs

Another study suggests the Framework for Strategic Sustainable Development (FSSD) for BR planning framework and a tool for assessment on community engagement through five Process Characters, including Transparency, Cooperation, Openness, Inclusiveness and Involvement, which originated in six of UNESCO BRs' cases in Sweden and Canada (Jackson et al., 2011). However, this study found that the gap between BR concept and FSSD as an ideal model was lack of understanding on the meaning of sustainability and the lack of use of principles in high level planning process (Jackson at al., 2011). In other words, the character of BR management was determined by the local residents and empowerment of the local residents to understand the sustainable environmental management and create their own principles based on the circumstances of the BRs.

Jackson's suggestion on community participation presents how and in which sectors the communities around BRs should be strengthened; "Representative

Organization, Communications Strategy, Facilitated/Hosted Dialogue, Invitation to Co-create, Neutral Spaces, Bridge Building and Networking, Co-learning Reciprocity Approach, Trust Building, Working with the Positive.” (Jackson et al., 2011).

Meanwhile, Pulido and Cuevas-Cardona (2013) and Firtz-Vietta et al.(2009) demonstrate the community empowerment through income generation activities would motivate community engagement on BR management. The cactus nursery business in a BR program of Mexico created jobs, reduced emigration to look for other types of income generation, and provided education and pride of being part of the BR management through recognizing the BR conservation through cactus conservation is necessary for their livelihoods (Pulido and Cuevas-Cardona, 2013). The case of the BR in Madagascar ensured the connection between improving livelihoods and conserving biodiversity through creation of the project providing the benefit of increasing profits to the participants from the communities around the BRs. These benefits for communities should be based on market linkage and sustainable and good coordination, since unsustainable benefits would frustrate the beneficiaries to go back to their old habits which were not environmentally friendly livelihoods (Firtz-Vietta et al., 2009).

4. Forest, Poverty and PFM in BRs

It has been questioned why the poor are usually found in the forest. As a matter of fact, when the natural forest is degraded, the livelihood of the forest residents who depend economically on the forest services and the products are negatively impacted. (Sunderin et al., 2005). Theories about the relation between economic growth such as ‘Environmental Kuznets Curve (EKC)’ have been applied due to the fact that the

concerns toward environmental issues are usually minor and the least priority for the low income countries while industrialization and economic development are their top concerns (Stern et al., 1996; Iritie, 2015). However, EKC has been also has been criticized by other studies. De Bruyn et al (1998) found the economic growth and CO₂ Emission have a similar relationship and Shafic (1994) and Holtz-Eakin and Selden (1995) presented that the maximum income in their sample was lower than the turning points that direct the human preference and interest on the environmental issue to become their priority (Iritie, 2015).

According to Gutman (2001), the increase of the poverty and environmental degradation has no positive relationship. Specially, in tropical countries, the both positive relationship between deforestation and income or Kuznets curve relation were not found. For example, in Africa, it is not clear if the farmers engaged in deforestation are poor because of the result of deforestation or the poverty causes the deforestation. Therefore, the reason for the poverty around the forest is more diverse and the poverty is not the direct cause for environmental degradation. In this regard, Gutman insists that the relevant policy changes and strategies for market can protect the forest from deforestation since the policy and the market are the more important drivers (Gutman, 2001).

Recently, the most considered method for biodiversity conservation is the protected area management in Africa, even if increasing protected areas is not always most effective because of its complexity on implementation (Iritie, 2015). As one of the mostly considered principles for implementing protected area management, Community Based (CBM) has been causing arguments in terms of its efficiency to achieve conservation and economic development at the same time. To answer this question on

why CBM has often failed to achieve the goal, Delado -Serraon (2017) assessed the indigenous-based, conservation strategy based on a constitutional reflection of ancestral land rights in several in Latin America countries.

The study found that government systems, the histories of the place, and political dynamics of the targeted protected areas can influence the result of CBM. It was recognized that as a collaborative process between the natural resource users and government, CBM cannot direct the best result when it is led by the external drivers who do not usually reflect the local knowledge, regulation, the current changes, trends and status of the local environment and economy. The external drivers, such as global stakeholders, who request the natural resource protection within a country also must be combined with local views on the livelihood options and income generation status (Delado-Serraon, 2017).

While the external actors' integration on the local systems and regulation for CBM is one factor influencing the success of CBM, another factor required to make a successful result of CFM that the capacity of the internal drivers for the protected area management, their recognizing the laws and regulation as well as the importance of environmental conservation and the willingness of compliance to the law and regulations (Delado-Serraon, 2017). As another example of CFM, Nepal is known as one of the first countries which approved and implemented CFM. In its historical experience, the strength of community capacity and partnership to make decisions for the public land and protected areas management fully covers the local needs and its knowledge is the most important factor, even considering economic development (Anup, 2017). However, the

capacity of the community and willingness to participate in the process for CFM is not automatic.

To motivate participation of communities around the protected areas, direct benefits should be provided to the communities through the offsetting of their efforts and costs engaged for environmental conservation actions (Magome and Fabricius, 2004; Downie and Dearden, 2017). It is a vicious cycle that increased vulnerability of natural resource condition which is caused by the environmental changes and harmful income generation activities by both internal and external forest users, threatens the productivity of the natural resources and reduces the willingness to pay for the environmental conservation.

The Amazon's case shows that Brazil's government has not only been focusing on the environmental conservation, but also economic development which values the forest protection. The Brazilian government provided strong policies, such as increasing protected areas, protecting indigenous territories, creating laws to ban illegal logging and clearing forests, devaluing the high level deforestation activities in municipalities and strengthening the satellite based technology for monitoring deforestation status (Seymour and Busch, 2017).

These policies made deforestation less attractive but the strong environmental governance in Brazil was accompanied with a model which presents a tradeoff between agriculture and forest conservation (Koch et al., 2017). For instance, cattle and soy production and productivity which are known as the main actors of forest clearing, was increased, decreasing deforestation at the same time, through the policy that couples the high-yielding farming practice and forest conservation. In other words, instead of

choosing and implementing only one intervention of these, paring both is more successful (Phalm et al., 2016; Koch et al, 2017). The case of Amazon is linked to Iritie recommendation for the three factors to improve the protected areas management, such as ‘integration of economic aspects of conservation, increased financial incentives and operationalization of the institutional and legal frame work of conservation plans’ (Iritie, 2015, p.15).

Moreover, studies (Naidoo et al, 2006, Adams et al, 2010; Chioza et al, 2010; Hauer at al, 2010) also criticized the community’s ignorance on the economic aspects to identify priorities of conservation and the trade-off between conservation costs and benefit (Iritie, 2015). According to Iritie’s study (2015), in most of African countries, the framework for protected areas is suitable, however, the problem is that the frameworks are not effective due to the weak enforcement on its management, especially for the areas that attract economic interest. Therefore, based on these studies, the best way of motivating the communities surrounding the forests and the protected areas for their management is to guarantee the clear trade-off between the conservation and economic development through increasing income generation accompanying government’s strong support through the policies for both environmental conservation and economic activities.

Globally, forests create 13.4 million formal jobs related to natural resources such as wood, pulp and the paper sector, while 41 million informal related jobs exist in developing countries (FAO, 2011). The common trend in forestry job creation is that employment in the forest of developing countries, for example Latin America and Asia Pacific, has increased due to cheap skilled labor and abundance of forestry natural resources. However, in European countries and North America, the forest resources no

longer increase employment, as these manual skills have been replaced by machinery use which can be more cost-effective, and deforestation has been raised as a serious issue. Though the number of traditional forestry workers has decreased in Europe and North America, high income generation activities exist such as forestry management for recreation and ecosystem conservation. In other words, these high-income generation activities decrease deforestation (FAO, 2011).

This forestry job trend is not just determined by the demand of forestry services, but the level of education and capacity of the residents surrounding the forest also support the trend. Kimengsi et al.(2019) found that older individuals are more dependent on producing forestry products for living, and more educated locals are less dependent on the products from the forest than the less educated. Also, the older people and higher educated people invest in high-value, diversified forestry products (Kimengsi et al., 2019). In this regard, the residents of forests in many African countries end up having more dependency on traditional forest products and lack of diversity of forestry livelihoods because of lack of technology to process the forestry products in cost-effective manners and poor guidelines for commercialization of the products (Kimengsi et al., 2019) as well as lack of education.

FAO (2011) insists the importance of improving “Sustainable Entrepreneurship” for the local to promote sustainable forestry production and efficient forest management. Baumol suggested that “Entrepreneurship can be a productive or destructive force” (Baumol, 1990; FAO, 2011). Entrepreneurs are the ones who try and explore the best business strategy and, given opportunities, copy a successful case and are not afraid of being in competition to maximize the profits that sometimes cause the manipulation in

the forest. Sometimes, too strict community regulations become obstacles for the local entrepreneurs to do their business (Delado- Serrano, 2017). Especially in Africa, most of the conservation policies do not benefit local entrepreneurs who create business with sustainable forestry products such as honey, medicinal plants, or sustainable timbers (FAO, 2011). Therefore, it is important that the communities have a mindset of entrepreneurship which is not for exploitation but for efficiency of forest management, maximizing forest conservation to seek economic benefits.

This thesis will use the project, Green Economy in Biosphere Reserves (GEBR), as a case study to assess the impact of green forestry businesses on communities surrounding a BR in the Usambara Forests of northern Tanzania and consider whether any impact on CFM and BR management may exist. , The project focused on the roles of local residents and the local government during the project design and implementation. Due to a lack of significant funding and a 3 year duration, the project was designed and implemented to increase the communities' capacity. Through creating activities to enhance the local residents understanding of the importance of environmental protection to better access the natural resources as entrepreneurs, local residents learned to make decisions and negotiate for their environmentally sustainable business under collaboration with their neighbors and market extension.

CHAPTER 6

METHODOLOGY

1. Research Strategy

This thesis is based on an empirical assessment of the project “Green Economy in Biosphere Reserves” in Tanzania, which was conducted for three and half years. The project had been planned and initiated prior to the beginning of the assessment and, therefore, the information obtained, and the analysis conducted on the project were done during its implementation which includes the project activities to achieve the goals, monitoring, and the closing of the project. This project does not represent a new concept, however, the close observation on the process of its implementation can be considered as a new research.

2. Research Method

For observation and analysis on the GEBR project, this study used a mix of qualitative and quantitative methods. The qualitative method was used for the description of the social, economic, and environmental impacts of the project implementation through personal and group interviews and surveys which were done by several consultants of UNESCO. The quantitative method for the explanation of the changes of the social and economic condition of the communities around the project site used numeric data observed by the consultants of UNESCO to analyze the change of the

economic condition of the project beneficiaries through the consultants' monitoring reports for their responsible green business groups.

3. Research Approach and Progress

The research for GEBR project used the inductive approach to answer a research question; How does the UNESCO Biosphere Reserve program and the Green Economy economic development approach impact the community in the Usambara Forests of Northern Tanzania?

Therefore, this thesis begins with the analysis for the historical origin and development of BR and CFM in Africa, finding the important factors and recommendation for the management of BR and CFM in not only in Africa but also in Tanzania as well as community involvement in their management through literature review in the previous chapter. This study narrows down to the case of GEBR project in Tanzania to present how community engagement in green business development can be created and how environmental management is closely connected to economic benefits that the community can obtain through various kinds of livelihoods. The GEBR project provides the actual case of difficulties of implementing CFM and BR frameworks through identifying its limitation during the project implementation as well as its results.

To address the research question, the assessment on the GEBR project shows the changes in beneficiaries' socio-economic and environmental aspect and how these changes influenced the community mobilization for green businesses in the forest. This assessment shows well implemented income generation activities in the framework of a

the Green Business Model created by this project can establish a very strong foundation for the forest management.

4. Sample

For the GEBR project, the sample size used in the study is 985 beneficiaries who are separated into 73 groups and who represent 89 villages from three districts; Muheza, Mkinga and Korogwe. These beneficiaries are all engaged in six green businesses; beekeeping (415 people, 38 groups), spice farming (236, 12), mushroom farming (37, 5), butterfly farming (57, 3), fish farming (147, 11) and alternative charcoal production (70, 2). Originally, the project intended to target only 200 to 300 beneficiaries due to the issues of limited budget while targeting a large project area, however, villages and beneficiaries were not clearly limited and fixed in the beginning. Therefore, one of the first activities was selecting beneficiaries for the project and it ended up gathering 1,300 beneficiaries who want to participated in the training, but this number changed during the implementation due some participants' changing minds and quitting their participation or getting new participants. As a result of these changes, the sample population for analysis of the project results in this thesis became 985 people.

5. Data Collection and Analysis

To understand the issues underlying the GEBR study, the literature review presented above seeks to provide a foundation for the origin of CFM and BR and their development internationally, and specifically in Africa, and the factors which make their management successful or unsuccessful based on studies from 1992 to 2018.

Based on that foundation, the data gathered for this GEBR project included that from UNESCO's reports on the project progress, monitoring, analysis of before-and-after situations of the project, during the implementation and numerous monitoring reports from 2014 to 2017. Most of the UNESCO reports were written after consultation with beneficiaries and group and individual interview, collecting statistical records on economic activities such as profits or revolving fund systems in the groups. The information on profits from the six green businesses were mainly gained from the groups' interview which was done by technical skill trainers who have created strong business mentoring relation with beneficiaries. Also, the receipts that the spice farming trainer had after he purchased the products from the spice business groups created by GEBR project became relevant data. The revolving fund systems, which will be discussed in detail below, were easily observed by the entrepreneurship trainers' assessment, since the beneficiaries were required to keep the records as one of the results of the financial inclusion training and consult with these trainers while they learned the process to run the fund system. Increased investment in each business was observed by the increased numbers of instruments or resources purchased, built, rented by the groups such as beehives, mushroom shelters, butterfly farming cages, seeds for spices or mushroom, and fish ponds.

Data for this study was obtained the following reports: biodiversity inventory report (2014), market and product analysis report (2014), 11 business and technical training activity reports (2014 to 2016) and six green business need analysis reports (2015-2016), 12 green business monitoring reports (2015-2017), revolving fund monitoring report (2017), socio-ecological analysis report (2017), and business

assessment report (2017). This data from these reports was analyzed to compare beneficiaries' social and economic situations and how these social and economic changes impacted on their behavior, mindset and plans toward the forest management before and after the project implementation.

Due to changing project frameworks and activities to support the changes of the logistical framework, the number of beneficiaries for the thesis analysis was also changed from targeting 200 to 300 people to 985 people. Based on this situation, the result of original training model with targeting 200 to 300 beneficiaries was compared to the changed green business training model which benefit 985 people in this thesis.

6. Research Limitation

The project was not designed and implemented for this particular study but the research analyzed the project after its implementation was complete. Also, the project objective was for environmental protection through providing alternative livelihoods to the communities. In other words, the focus of the project was based on the purpose of poverty reduction with the assumption that the poverty reduction through beneficiaries' experiencing Green Business Model overseen by the author would direct them to strengthen their mindset as entrepreneurs to improve their socio- economic situation and that might lead to increased concern for and management of their surrounding natural resources in the forest.

Therefore, the project presents clear economic data in the communities, but does not capture directly how the GEBR influences CFM and BR management and environmental impact. Changes of the mindset in the communities were only captured by

individuals' and groups' interview during the last monitoring activity in May 2017 by consultants' socio-ecology assessment on the impact of GEBR project in the communities in and around EUBR.

It was difficult to compare the changes of beneficiaries' incomes, investment and production before and after the GEBR project implementation, since there was no accurate technical assessment on income generation before the beneficiaries became involved in the project implementation. The baseline survey was done in 2014, however, the sample population for the survey is not exactly the same sample for the GEBR project beneficiaries since some original participants stopped coming to the training or dropped out from the business and some of the beneficiaries joined in the groups in the later stage of the project implementation.

Moreover, due to cultural aspects, the community residents involved with the GERB project may not have provided accurate information on their earning to the researchers coming from outside the villages or government officials. It was suspected that earnings reports may not have been accurate as the community members may have the mindset that they expect more financial support from the government by pretending to gain less profits than they actually earn. However, other researchers addressing the community's technical skills were contracted to obtain data for the baseline survey activity in 2014. Therefore, this study assumed the changes for income, production and investment through reviewing the reports from technical skill trainers monitoring each business and entrepreneurship trainers' assessment of the beneficiaries' record keeping in each group's revolving fund was more accurate than the self-reporting of earnings by individuals.

CHAPTER 7

GREEN ECONOMY IN BIOSPHERE RESERVES (GEBR) PROJECT IN TANZANIA

Funded by the Korean International Cooperation Agency (KOICA), Green Economy in Biosphere Reserve (GEBR): A means to Poverty Reduction, Biodiversity Conservation and Sustainable Development in Sub-Saharan Africa Project in Tanzania was implemented from November 2013 to October 2017 within the framework of the Man and the Biosphere (MAB) Programme, UNESCO. The project originally targeted three countries; Tanzania, Ghana and Nigeria, but all three countries have different methods for implementation and achieving goals and this study focuses solely on Tanzania. The main objective of the project is to diversify livelihoods of the local communities in and around the East Usambara Biosphere Reserve (EUBR) in Tanga, which extensively depends on the forest natural resources for their livelihood, through the introduction of environmentally sustainable technology and capacity building for running small green businesses, with the anticipation that this would eventually result in the EUBR protection.

Six Green Businesses were selected based on the preference of the communities and environmental conditions, as well as existing and potential market; beekeeping, mushroom farming, spice farming, fish farming, butterfly farming, and alternative

charcoal production. These businesses were expected not only to reduce the poverty in the communities but also to motivate the local residents to participate in EUBR protection which covers the part of three districts, Muheza, Mkinga and Korogwe.

The core organization for the project management was UNESCO Dar es Salaam Office under collaboration with the Man and Biosphere (MAB) National Committee. However, the implementation was carried out through the strong collaboration with the local government, Amani Nature Reserve Office which is also authorized for EUBR management under Ministry of Natural Resource and Tourism, UNESCO National Commission for the Republic of Tanzania, Aquaculture Division in Ministry of Livestock and Fisheries, private sector and CSOs (Civil Society Organizations), such as New Leaf Consulting Company, Tanzania Honey Council, Start and Improve Your Business Association (SIYB), Zanzibar Spice Producers LTD (ZASPO), Tanzania Forest Conservation Group (TFCG), Dar es Salaam Mushroom Growers Association (DSMGA), Appropriate Rural Technology Institute (ARTI) Tanzania, and Poverty Reduction through Environmental management Maricultural Agribusiness and Association Development (POREMAD).

To improve the capacity of the surrounding communities in EUBR, the project activities were mainly carried out in three sectors; i) assessment for biological, social and market status for the green business, ii) training for entrepreneurship and monitoring the business process after the training, and financial inclusion and creating the network among the green business groups, iii) training for environmental issues, environmentally sustainable and advanced technical skills and creating and extending the market for the business. During the implementation, a green business model was created, which is

suitable for the environmental and social conditions of the beneficiaries. The project was implemented by the approach focused on behavioral changes from farming to green business entrepreneurship, as well as a shift away from traditional attitudes of donor dependence and towards more self-reliance. Training, monitoring and mentoring was undertaken by local business experts that were able to also strengthen their own networks and supply within the markets.

The green business model included the following steps:

- i. Adoption of advanced green technology
- ii. Improved ownership of green businesses
- iii. Building revolving fund systems within business groups
- iv. Strengthening collaboration in business operationalization

1. Outcomes of GEBR Project

Based on the analysis of the 2017 report from each of the six Green Business Analysis UNESCO Dar es Salaam, a total of 839 beneficiaries in 78 green business groups are directly engaged in six green businesses: mushroom farming, fish farming, beekeeping, spice farming, butterfly farming and alternative charcoal production in EUBR. The project budget was about 430,000 USD for three years and originally aimed to include approximately 200 beneficiaries, however, the number of beneficiaries was extended beyond the expectation, not only because of the cost-effective project management, but also due to the beneficiaries becoming motivated to value the technology and knowledge for their business and participate in the training and activities

in business groups. The project influenced 11 villages in three districts directly and about 20 neighboring villages indirectly in three districts; Mkinga, Muheza and Korogwe.

(1) Assessment for Environmental, Social and Market Status for Green Business

The first step of the project implementation was analyzing the environmental, social and market situations in the project area. Through this process, the potential targeted villages and numbers of beneficiaries and business groups were recognized. These numbers change as different phases of the project are implemented, however, it was important to understand the potential number of beneficiaries impacted. The first market study showed which green businesses currently existed at the implementation of the project and potential markets overall. The project also conducted a feasibility assessment for the market, business and human resources for each of the selected six green businesses. The social and environmental assessment, such as the baseline survey and biodiversity inventory analysis which were conducted by Centre for Climate Change Studies of University of Dar es Salaam and Amani Natural Reserve Management Office related to the 89 villages, provided the information to understand the level of training to select trainers and implementers who can bring the suitable education and knowledge for the beneficiaries' education and economic and environmental conditions. Moreover, depending on the environmental conditions, different kinds of green businesses were recommended by the trainers and experts who are already engaged in the business field.

(2) Training for Entrepreneurship, and Financial Inclusion and Creating Green Business Network Among the Groups

Continuous training for two years helped the beneficiaries obtain new knowledge and adopt the advanced technology for the green businesses. Moreover, the training was

the most effective method to communicate with the beneficiaries and to motivate them to change from intermittent farmers to the entrepreneurs as professional farmers.

The training for marketing, management, finance, entrepreneurship and accounting skills were conducted by certified trainers by International Labors Organization called Start and Improve Your Business Association (SIYB).

In the first training in July 2014, only 185 beneficiaries out of about 1300 people in 93 groups were invited to the training. Those invited had leadership positions in the group, and it was expected that the training knowledge would be delivered to the members, due to the lack of funding to cover all potential beneficiaries for their accommodation and food.

However, there was a strong demand for more entrepreneurship training from the beneficiaries due to the leadership's weakness in transferring the new knowledge to their group members as well as the importance of all members of the groups to have entrepreneurship. Therefore, UNESCO changed the strategy for the training from inviting the beneficiaries to one place and paying them cash for their accommodation and food, to sending the trainers to the 7 villages (Zirai, Foroforo, Kuze, Mlesa, Mkwakwani, Mnyuzi and Sakale) which are the centers for other villagers to be more accessible to the training opportunities. This change in the approach caused the number of participants in the training activities to be reduced, because the people who dropped from the participation in the project activities expected to gain cash for accommodation and food through attending the training in distance, but receiving the training in their villages meant that did not receive any payment.

In March 2015, mentoring of green business plans for the last component of the project was conducted to support revision of beneficiaries' business plans for the selection of quality and desired business types. This activity found that Eight hundred forty nine (849) farmers (organized in 78 groups) were are still interested in green businesses under the framework of GEBR project.

In June 2015, to build the capacity of beneficiaries on revolving fund management within each group as well as strengthening group relations, four hundred and seventeen (417) participants were selected from 60 groups out of 78 groups; 102 males and 315 females benefited from the training through two phases. The first stage was to train selected 20 groups based on assessment of their business plans which shows their higher capacity than other groups. The second stage was to supervise these 20 groups to train the rest of the 40 groups. This strategy motivated the first trained 20 groups to have leadership and build the close relationship with other 40 groups through the training activities. Non-selected groups for training were combined with the trained groups. During this training, each group selected leaders democratically for chairs, secretary, and accountant and learned how to build communication strategy and a welfare system within their group. The beneficiaries started to learn and practice working together as a team.

After conducting technical skills training for each green business in 2016, the beneficiaries were mentored in their business plans and operations and prepared to create green business associations. Based on their willingness to form associations, they organized 26 associations which includes about seven hundred farmers (700) in 85

groups (45 percent of the total are women). This activity improved their capacities for developing business plans, action plans and how to register an association.

The analysis of situations of the green business groups of consultants' reports on business assessment report by New Leaf Consulting Company on May 2017 based on interviewing 672 beneficiaries from 48 green business group in 21 sample villages, are below;

- 60 groups green financed through internal revolving fund mechanisms based on local cultural micro- financing practices (VICOBA)
- 27 groups are running total USD 9300 under revolving fund systems
- Changed mind-set of farmers from donor-dependency to self-reliance favoring group savings and investments
- 60 groups formed in 20 associations and 6 out of 20 associations on the process of registration (Two associations in EUBR were officially registered under BRELA and 19 groups out of 60 groups were registered under district offices)
- 15 groups out of 60 groups have bank accounts
- Micro-finance organization, Tanzania Postal Bank conducted the business assessment to select the beneficiaries for offering loans. In 2017, two associations were expected to be visited by the bank for the potential financial support. The rest were on the waiting list for the financial support from Tanzania Postal Bank until they are qualified to get loans.

(3) Training for Environmental Issues, Environmentally Sustainable Advanced Technical Skills, and Creating and Extending Market

The Ministry of Natural Resources and Tourism provided environmental and biodiversity education to the 185 beneficiaries in the first training in July 2014. The influence was not monitored, and the context of the training was not directly related to how green business would solve the environmental issues in EUBR, but these were covered during the technical skills training for green business. After the technical skills training and once the business operation started, the size of groups increased or decreased depending on the success of the business results.

A. Butterfly Farming

Tanzania Forest Conservation Group originally trained forty eight (48) farmers from Korogwe and Muheza districts in July 2015 by the Tanzania Forest Conservation Group (TFCG) on the principles of butterfly farming, butterfly farming requirement (laws, regulations and equipment), obtaining the breeding stock, butterfly production, pupae storage, butterfly varieties and their season, factors affecting butterfly business and management and preparing the butterfly farm for production. These butterfly farmers added butterfly farming activities to their other income generation activities which were not clearly captured in the baseline survey. However, butterfly farming activities became one of their main income generation activities. According to the analysis of UNESCO in 2017,

- 3 butterfly farming groups formed comprising 57 beneficiaries and one butterfly association was registered officially under Business Registration and Licensing Agency (BRELA)
- 3 butterfly cages were constructed by UNESCO training and 9 cages were built with investments by the trainees
- The most advanced group earned USD 4,700 for year 2016 only (between October 2015 and April 2017 they earned USD 6855)
- Direct market linkage through Tanzania Forest Conservation Group

B. Fish Farming

Due to the water quality requirements for fish survival, water quality and the condition of any existing ponds in the proposed areas for fish farming was assessed. This assessment was conducted by the Ministry of Livestock and Fisheries Development and Poverty Reduction through Environmental management Maricultural Agribusiness and Association Development (POREMAD). The technical training sessions were designed and held by POREMAD for 69 farmers in August 2015.

The training provided the participants with knowledge on freshwater fish culture planning, pond design and construction, species suitable for culture, fish farming economics, fish preservation, fish pond management, preparing fish pond for stocking, stocking fish pond, feeds and feeding fish, water management in the pond, preventing fish diseases and controlling predators, harvesting fish and processing, quality control and marketing, intensifying production in the fish ponds and fish farm record keeping as well as fish transportation and sensitization on the need to work in associations. Identification of suitable sites was also part of the training.

During August 2016, in each of four fish farming training zones, UNESCO conducted one fish farming pond construction using all beneficiaries' labor with agreement of circulating the benefit of fish pond construction based on the profits from the first fish pond.

Based on the analysis of UNESCO in 2017;

- 147 fish farmers organized in 11 groups with improved knowledge on conducive environment, species and techniques for fresh water fish farming in EUBR
- 4 fish ponds were constructed through UNESCO training in each of four zones and 23 fish ponds were constructed by the beneficiaries by their own investments.
- The most advanced group owns 25 fish ponds which are producing an average of 210kg of raw fish per 6 months.
- Additional income generation through combination of fish farming with vegetable farming created just beside the fish pond to use the water resources.

C. Beekeeping

Beekeeping has been mentioned as having a huge potential as an environmentally friendly business since National Forestry Policy (1998). During the training needs assessment for 38 groups with 394 beneficiaries, it was found that most of the beneficiaries have beekeeping experience and are motivated to scale up and solve

problems they face through learning new skills and knowledge. However, the groups need stronger teamwork and ownership. The technical training in the recommended villages of Ubiri, Zirai, Mlesa, Kuze, Mnyuzi, Mkwakwani, and Foroforo for beekeeping, covered the following topics: Group dynamics, Natural resources, Bees and colony, Beehives and apiaries, Preparation of tools and harvesting of honey, Bee products and quality issues, best practices in processing, honey packaging and marketing, challenges and opportunities in beekeeping. The second phase of training involved in-service training combined with a study visit to Lushoto, Tanga Region where successful beekeepers are located.

The most current UNESCO analysis of the situation of beekeeping business groups in 2017 shows that;

- 38 groups formed and 415 people were equipped with skills on beekeeping production and management in EUBR
- About 400 beehives were invested in by beneficiaries since October 2015
- The most advanced group owns 100 beehives and is under processing house construction as well as diversifying production; soap and bees wax
- Direct market linkage and knowledge sharing secured through one year free membership of Tanzania Honey Council

D. Spice Farming

The Zanzibar's Spice Producers (ZASPO) CO. Ltd conducted spice farming and tree nursery training needs assessment in July 2015 to 254 beneficiaries in 23 groups. According to the assessment, the climate and environment for spice farming and tree nursery is very favorable in East Usambara Biosphere Reserve. In this area, cinnamon, pepper and cardamom have been produced as income resources. However, this cultivation has not been connected to increase the revenues. Farmers lack knowledge on good agricultural practices, postharvest techniques, marketing skills, and working as a

team. The assessment shows that East Usambara Biosphere Reserve is suitable for the cultivation of most tropical spice crops. Recommended crops to be promoted and improved are clove, cinnamon, pepper, turmeric, ginger, cardamom and vanilla. Among these, vanilla, ginger and turmeric are new spices. Also, vanilla and cardamom can make high profits, when their quality meets the requirement in the markets. Training on harvesting and agriculture practices, storage and packaging, plant protection in spice tree nursery, production import requirements and regulations was completed during September and October 2015 in 6 centers of Kuze, Foroforo, Mlesa, Sakale, Zirai and Mkwakwani & Myunji.

As a result of the project activities in spice farming, the below was presented in UNESCO's analysis in 2017;

- 236 farmers under 12 groups organized in 5 associations equipped with skills for spice production in EUBR
- Market linkages with buyers in Dar es Salaam, Denmark and Canada were established.
- Value added to local spices; Cloves, Black Pepper, Cinnamon, Cardamom, Ginger, Cocoa
- New environmental suitable spices introduced; Vanilla, Lemon Grass, Turmeric
- Smart partnership with a private company enabled both skills development and market linkages
- Increased use of spices among communities for medication and nutrition purposes
- Income of about USD 140,000 was increased since October 2015

E. Alternative Charcoal Production

Alternative charcoal production technical skills were transferred by Appropriate Rural Technology Institute (ARTI-Tanania) to 76 beneficiaries in two villages (Potwe Mpirani and Makumba) in EUBR in 2016. The technical skills training was on how to convert dry biomass such as leaves and stems from agricultural wastes after harvesting

corns, sugar canes and other agricultural products into charcoal powder that can be used in the making of quality charcoal briquettes. Each participant was provided with a training manual on the first day of training and awarded a certificate at the end of the training. UNESCO provided one charcoal making machine in each of two villages. Ward officers in all three villages participated in the facilitation of the training.

The UNESCO analysis of these groups in 2017 presented as results of the project, presented;

- 70 alternative charcoal producers grouped into 2 groups and initiated businesses in EUBR
- Production and marketing initiated immediately after the training
- Linkage with Mkinga District and Mheza district for marketing.

F. Mushroom Farming

Technical skills trainings on mushroom farming was conducted by the Dar es Salaam Mushroom Growers Association to 54 beneficiaries of EUBR in July 2015. The training included understanding the requirements for selection of the location for mushroom shelters, substrates preparation and packing, sterilizing and cooling of mushroom substrates, and mushroom seeds planting and storage of mushroom in a shelter. Two mushroom shelters were built during the training for practical purposes.

The results of this activities in 2017 are the below;

- 37 farmers organized into 5 groups in EUBR
- one group recently initiated by training from one of beneficiaries' groups
- Two most advanced group have earned USD 1260 for last two years.
- Mushroom shelter construction with local, low costs and sustainable materials (2 shelters were constructed by UNESCO training programme, 39 shelters constructed by the groups' investment)
- Increased network on the business through Dar es Salaam Mushroom Growers' Association
- Types of Mushrooms species; White Oyster, Sajukaju, Pink Oyster and PR Oyster

(4) Green Business Contribution to Environment

According to the socio-environmental assessment in May 2017 which is done by a UNESCO consultant, (Socio-ecological Assessment Report, 2017) several habitats near sites where there has been an established green business had effectively protected further damage to the edges of a more pristine forest and riparian habitats at most of the intervention sites. It is essential to understand that the edge effect can vary dramatically according to patch size and to the tilt of the edge. The edges that had been created due to previous anthropogenic activities including timber extraction and wood fuel collection had adversely deteriorated the ecological health of the interior habitat and had subsequently increased habitat fragmentation, whereas the management options to reduce the ecological impacts of edges that were introduced from the establishment of green businesses has positively promoted protection of these edges from further fragmentation and deterioration, which occurred by external interventions of timber extraction business

The value chain assessment on May 2017 analyzed the chain from production (preparation), harvesting, processing, storage and packaging systems. Of all the green businesses, butterfly farming, alternative charcoal production and beekeeping business were marked as 100% environmentally friendly because they use organic materials which is not environmentally harmful in each step of business operation from producing products to packaging the products. The mushroom groups acquired 100% environmentally friendly business in the preparation stage for productions mainly in the construction of the mushroom shelters which used all the materials from picking up woods in the forests and reusing plastic bags for building the shelters, except for the packaging which assessed as 50% because of the use of plastic bags as a means for

packaging. The spice and fish farming had acquired 100% environmentally friendly to construct fish ponds with organic materials, except during packaging where they used plastic bags for packaging to be sold to the final consumers

The interventions as a result of green businesses have provided a platform of resilience for the beneficiaries. It is expected that dependency rate of the individuals on natural resources based particularly on harvesting of forest for timber and wood fuel will be decreased, because the project training educated former traditional charcoal makers for alternative charcoal making technology not to use woods for charcoal production.

Killangangua Fish Pond in Tanga where the beneficiaries have spoken outright on their motivation and responsibility in the protection of the upper catchment areas above their village to ensure that the water made available by natural capital continues to drain water for their domestic uses but also more profoundly the availability of water for their fish pond.. However due to the short time after the project was finalized, it was yet immature to observe the results of the project in terms of these environmental changes and improvement on the forest management.

CHAPTER 8

DISCUSSION AND LIMITATION ON THE GEBR PROJECT

1. Discussion

Through the assessment on the histories of CFM and BR management and reviewing the literature, this study found several weak points in communities' conditions which have contributed to the failures of the implementation and the sustainability of CFM and BR management in Africa which are also applied to the GEBR project area in Tanzania. The weak points this study identified and which are discussed below include: 1) lack of alternative livelihoods to the common livelihoods which has intensive dependency on the forests, 2) lack of allocated funds for CFM and BR management, 3) capacity of decision making and negotiation for nature resource management, and 4) awareness on the importance of natural resource management in the most familiar way, using indigenous knowledge and natural resources.

Considering those weaknesses of communities in and around the GEBR project, this study analyzes whether these weaknesses were improved and/or strengthened within the sample population to measure the success and failure of the project. With this assessment, the impact of the GEBR project in the communities will address whether communities can be mobilized for participation in CFM and BR management. Therefore,

this discussion will also explain how Green Business Model of GEBR project assists with the creation of a foundation for community mobilization for CFM and BR management.

Moreover, this discussion will focus on the result of the second green business training model which is comparable of the originally designed training model for the project. The project was implemented based on the first training model which targeted to train 200-300 representatives out of total targeted population 1,300 as beneficiaries with one time entrepreneurship training, conducting one time technical skills training for 5 green businesses; beekeeping, mushroom farming, tree nursery and farming, butterfly farming and fish farming and one time biodiversity education until 2014. Due to the weakness of logical framework and activities designed to achieve project objectives, such as increasing income generation and alternative livelihoods diversity and reducing the use of firewood for cooking while having too ambitious target of 1,300 beneficiaries during the year of 2014, according to the monitoring reports from the entrepreneurship trainers in 2015 which was provided by SIYB , most of the beneficiaries were not able to operate the green businesses and expressed that they needed more trainings to learn technical skills and improve financial literacy. Moreover, the implementation of the first training model was not cost-effective, since each training gave away money to the beneficiaries for their food, transportation and accommodations and most of the trainees have to travel to come to the training venues in long distance from their villages.

Therefore, as a project office the author persuaded UNECO Dar es Salaam Office to change the implementation model through creating new green business training model which includes more mentoring and monitoring the business operations, more specialized and sophisticated technical skills trainings and financial literacy trainings. Also, instead

of inviting the beneficiaries to the venue in long distance, they made the training venue within the villages to reduce time and money for beneficiaries' traveling to the venues. The training also conducted training of local trainers during financial literacy trainings so that they were able to reduce the cost for having too many training sessions to access all beneficiaries as well as to have beneficiaries keep teaching each other as local trainers which made sure sustainability of education and monitoring.

(1) Introduction of Alternative Livelihoods

It is known that the communities surrounding the forest usually are not economically strong (Sunderin et al., 2005). In the communities in and around the GEBR project, about 65% of the total villagers have primary school education and about 10% have secondary school education (Stakeholders Mapping and Consultation Report, 2014). Related to this low level of education, the population in and around the GEBR project area have mostly used the forest for their basic needs such as food, resources for building houses, heating, and cooking and for income generation, or they become involved in charcoal production and mining (Stakeholders Mapping and Consultation Report, 2014). The low level of education reduces the opportunities of residents to choose environmentally friendly, higher-income generation and diversified activities (Kimengsi et al., 2019). Also, these existing low-income generation activities in the forest would worsen deforestation (Sunderin et al., 2005).

In the Green Business model, introducing alternative livelihoods is included in its first step, "Adoption of advanced green technology." To improve the capacity in the communities around EUBR, this project focuses on helping them to gain economic power which reduces the poverty issues through increasing high income generation and

diversifying livelihoods by adopting advanced and environmentally sustainable technology and knowledge. Therefore, as Anup recommended based on the experience of CFM in Nepal (2017), “skill development trainings, income-generation activities, high yield forest resource, non-timber forest products and alternative energy technology” were designed and implemented in this project.

For all six green businesses, regardless of size, the markets were existing and assured. The market study and feasibility assessment for the businesses done by experts not only from the academic field, but also from the private sector, were necessary to inform the direction for creating marketing strategy. The trainers who were already working in the business, could directly become the model and mentor for the beneficiaries when delivering the most advanced and current knowledge and technology and market information, as well as linking the beneficiaries straight to the market. For example, spice farmers were the most successful in terms of economic growth, since their spice products were directly purchased by the companies not only from Dar es Salaam, but also other countries through the connection of the spice trainer who owns a large spice business. To meet the demand of these larger markets, the spice farmers were able to improve the quality of the spice very quickly, following their mentor, although quantity improvements were slow.

Based on quantitative data such as the amount of funds and use of the revolving fund in each group, increased production and income generation, provided by consultants’ reports on the assessment of each green business in 2017 done by New Leaf Consulting Company (Green Business Assessment, 2017), the spice farmers showed obvious success on adopting advanced technology as well as green business operation,

since each of them significantly increased the quantity of production and selling the products. Prior to Green Business training, they picked up spices naturally grown in front of their house and they did not know how to prepare the spices after harvesting in order to sell them. Now they use their unused land for farming spices, and they have improved the quality of the spices through training on the correct processing of spices. These results were concluded by the observation on the outcomes of increased income, production or investment in their business. The data on income from honey production was not well captured because the communities went through a drought period from January to April. The amount of honey produced was reduced and records were not well kept. .

(1) Improving Economic Power of Beneficiaries

Biodiversity conservation has always struggled from a lack of financial support, which is clearly a difficult issue to solve for the poor in and around the forest (Iritie, 2015). As it was mentioned in the literature review, one of the main reasons for decentralization of the authority to manage forests through CFM mechanism is also this lack of fund allocation for forest management, which is coupled with the poverty surrounding the forest areas. Laws and regulations related to CFM and JFM exist for the areas in and around EUBR, but the communities showed no interest in and have no capacity for getting involved in the forest management. Related to this situation, gaining economic power for the communities through operating green businesses is important to create the foundation for the acceptance of the natural resource management (NRM). The idea proposed is that by increasing their operations of green businesses, they would increase their knowledge for managing the natural resources, which would preserve or

increase their green business output. The idea is that resulting economic power might also provide the more possibility to volunteer to invest in the forest management.

From the beginning to the end of the project implementation, the number of potential beneficiaries and participants kept changing. The initial training model for green businesses created communities that realized economic gain by simply attending training, but not in building the green business. In this model, external donors and the government provided cash to the attending participants for food and accommodation, which normally exceeded the cost to the participant so the participants had a financial gain. Materials were also provided to start their business. This model was used many times without continuous mentoring and monitoring of the communities after the training.

For this reason, the status and the way of thinking for the villagers in and around EUBR overall was waiting for the next donors to give them temporary help. For example, most of beekeepers participated in GEBR project have already experienced with this one-time training with receiving 2 to 3 beehives for each group previously from external organizations.

As a result of this temporary support, after the previous program was closed, the beekeepers kept those 2 or 3 beehives for more than three years, collected the honey for personal or community use, and most of the beehives finished their lifespan. The standard of living in the communities was not changed even with the education and financial support. In other words, the beekeepers did not consider producing more honey to sell and invest in purchasing more beehives in order to expand their business while they are waiting for others or the government to provide free assistance.

This kind of mindset of the beneficiaries and the way of designing and implementation of the project could not guarantee the impact and the results of the project. Therefore, during the GEBR project implementation, a new approach or model was used to create an independent entrepreneurship mindset in the beneficiaries through continuous training and mentoring, not paying them to attend training, and building leadership and team spirit through managing a revolving fund. The beneficiaries were very against with the new model since they did not receive cash payments for the training and initially threatened the trainers that they would not return to the training without payment.

However, at the end, the beneficiaries started to focus on what they are learning in the training, instead of small pocket money, and the quality of the training attracted more villagers to attend the training sessions. Once they started to use the technology and the knowledge they gained through the training session and experience to produce, harvest and sell better quality and more quantity of products, they started to enjoy their status as independent entrepreneurs rather than waiting for someone else's help for their own lives. One year after beekeeping training, it was considered as a miracle to see the beekeepers, who used to keep 2 or 3 free beehives, pulled out their money from their groups' revolving fund systems to purchase 400 beehives.

Moreover, creating a revolving fund together with the members of each group has been the most effective way to experience the team spirit. Many beneficiaries invested some money from their green business profits into the revolving funds, which was then able to benefit not only the business but the group members' social welfare through their system. For instance, the fund would lend money to pay for their children's education

and to help other group members' urgent situation. Also, a part of revolving fund was used to purchase the materials for expanding their business, which means they began to create the basic form of small business company. To grow their business, most of the green business groups are formed under an association and each association has a constitution which includes the strategies for production, selling, marketing, investment, communication as well as increasing new members for the business groups.

Through these processes involving the running of the revolving fund and investing in their business, the beneficiaries learn how to own and manage their business as entrepreneurs which is the second step in the Green Business Model of the GEBR project: improved ownership of green businesses. Also, building the revolving fund system is the third step of the Green Business Model.

(2) Increase Capacity of Decision Making and Negotiation for Natural Resource Management

It has been found that those who are dependent on the natural resources in forests are weak or incapable politically (Secretariat of the Convention on Biological Diversity, 2009). This weakness has resulted in the lack of communities' engagement in the communication for the natural resource management with government and also external stakeholders. In other words, even if there are laws and regulations backing community involvement in forest management in Tanzania, the actual implementation of CFM cannot effectively cover the voice of the communities.

To practice raising their voice as a team, the training and mentoring emphasized working as a team in all green business in the GEBR project. Most of the beneficiary groups of GEBR have practice and experience with regular meetings to discuss about

their business and managing the revolving fund. Through these experiences they learn how to discuss their opinions and listen to others. They learn that production from a group can increase the amount and quality of the products. For example, prior to implementation of the current model, the spice farming group did not have knowledge on when to harvest and sell and how to process the spices they collected, As a result the product they sold to the middlemen was inferior. The middlemen then sold the spices during the prime season, but after mixing the spices with other debris to increase the volume. The poor quality spices then created a bad reputation for the quality of spices from Tanga. Currently, and with the new training and working in groups, the spice groups plan the time to harvest and sell at the proper seasons based on the agreement among the groups, since they know keeping this agreement guarantees better quality and quantity of spice products, which will increase their profits.

For the beekeeping business, the beekeeping technical skills trainers required the beekeepers to keep their beehives within the forest in the lower level of the mountain since the area would attract more bees. Some beekeeping groups from the higher level of mountain area struggled to get lower level land from the government for their business. As a team, they wrote a letter to the local government and also sought ways to negotiate for renting some forest areas in the lower level of the mountain to keep their beehives. Also, they decided to plant more trees to attract bees together, such as orange trees and others

The manager of EUBR proudly shared a case of community engagement for water resource management during a presentation to report the impact of GEBR project in Tanzania in the International Workshop for Closing GEBR project in Ghana in 2017.

Fanusi butterfly farming association contributed their part of income to build a fund for building water pumps in their village located in the high level of mountain area which struggled with a lack of water. Through their contribution to these pumps, the village can access water resources more easily and the villagers take care for water pumps in which they have a personal investment. According to the EUBR manager, these kinds of proactive actions from the communities to run their business and manage the natural resources were rarely happened before GEBR project implementation.

These experiences of the GEBR project beneficiaries to make decisions and negotiate for the use of their natural resources would strengthen their ability to manage the natural resources for their green business. Also, these actions can be originated when the communities feel their ownership towards not only their business and their lives but also the natural resources.

(3) Encouraging to Use of Indigenous Knowledge and Natural Resources

Another factor that GEBR project contributes to is to improve the capacity of community for their green business and using natural resources to direct them to use local knowledge and conditions and fully reflect the local systems and customs. All kinds of spices, honey, mushroom, butterfly products were from the local species or the species that are environmentally suitable for EUBR that ensured not only environmental conservation but also accessible and simple to start for the communities. The materials for building shelters for mushroom and butterfly farming are very easy to get in the local area and the forest as well, by picking up wood in the forests . Alternative charcoals are made from the wastes of the agriculture products such as leaves and stems of sugarcanes,

corns, sisals and other crops, which is very accessible in this area due to their heavy dependence in agriculture.

The revolving fund has traditionally existed in this area and is called VICOBA in Swahili, however, the revolving fund used by the green businesses added more systemic functions in VICOBA. For instance, VICOBA usually gathers money from its participants for a certain duration and, at the end of the duration, the total fund is divided between the participants. However, the new GEBR associations revolving fund system gathers money from the participants and uses the money for business investment, their member's well-fare and lending money to the members. This combination of local fund and revolving fund system was adopted very easily by the green business groups.

During the training and business operation, the beneficiaries gained knowledge for not only the most advanced and but also environmentally friendly techniques from business preparation to packaging. Technical skills trainers taught each business to use environmentally friendly or reusable resources for the business preparation during the training and mentoring for the business operation. The impact of this training and mentoring was shown in the socio-ecology assessment conducted during May 2017 through its analysis of each stage of value chain. For the business preparation, butterfly cages, mushroom shelters, fish ponds are all using the natural resources for their construction. The technology for alternative charcoal production uses bio wastes from agriculture activities which are easily accessible, so conventional charcoal producers do not need to cut trees or purchase firewood, thus decreasing their cost for preparation. Beekeeping and Spice farming activities do not need special preparation except for

purchasing more beehives and purchasing spice seeds, but the technical skills were based on the local species of bees and spices.

Also, alternative charcoal production activity, using advanced green technology which allow the charcoal producers to use the agricultural debris from the local crops was created as a green business category to impact the donor and government goal for CO₂ emission decreases. This activity was considered as the most needed by the local government, since conventional charcoal production has been one of the main income generation activities which cause deforestation.

Use of traditional knowledge and natural resources, such as cultivating local spices, mushrooms traditional butterfly species, using local agricultural wastes for charcoal production and attracting local bee species for producing honey in the communities is environmentally friendly and the most easily acceptable way to motivate communities to receive technology for their green business. Recognizing how to use their natural species for the green business operation, the beneficiaries experienced the pride on their surrounding natural resources and the importance of taking care of the resources. For instance, beekeepers who harvest honey out of local bee species, attracting the bees with the traditional trees, now plan to plant more trees for their business. Moreover, butterfly farmers also got pride on their natural resource, butterflies through exporting beautiful local butterfly cocoons which is rare and hard to find in other countries.

The influence of green business activities on the environment would not be seen in the short duration of this study, but it is expected that the green business operations will lead the beneficiaries to be interested in the environmental conservation based on several statements with all six green business groups. All the green businesses are

vulnerable to operating conditions when the forest ecosystem is not conserved well. For example, the fish farming groups started to consider the quality of water to grow Tilapia which requires clean water and the beekeepers recognized the importance of planting more trees for bees to bring more honey to the beehives. Therefore, by running green business and in anticipation of becoming more socio-economically successful, the beneficiaries are expected to become more motivated to get engaged in environmental conservation and management.

The GEBR project did not only use the local knowledge and resources but engaged the local government organization. The efficiency of the implementation and sustainability of supervising the green business operation in the field was caused by full support from the local authorities of EUBR management, such as Amani Nature Reserve Office which is also in charge of EUBR management. This office has all the knowledge and history of EUBR and the communities and it was necessary to have their support. Each activity was implemented under collaboration with this office and its staff, so that the staff also improved their capacity for the future supervision for the communities.

2. Limitation

Though the study is limited, this thesis was able to compare the prior training model with the new model and then assessed the financial benefit to the community for each green business.. However, the study is based on a project that did not include a baseline survey, therefore, it is hard to compare the changes in community impact and income generation resulting from project implementation in numerical terms. Also, under the first training model, few of the businesses continued over time, whereas under the second

training model, there appeared to be a greater likelihood for continued operation of these green businesses.

For the initial survey and under the first training model, due to the lack of funding and undecided numbers and names of targeted villages for the project, the baseline survey and biodiversity inventory assessment became very general and especially the biodiversity inventory was not used as baseline for the further assessment on the environmental changes and results of the project after the project was finished. The surveys conducted by Amani Natural Reserve office and Center of Climate Change Studies of University of Dar es Salaam covered the entire EUBR with only sample groups that hardly reflect the difference of selected villages later on. Moreover, the size of EUBR is very large to cover with allocated project fund which was originally targeting 200 to 300 beneficiaries and its population and , it was not realistic to target about 1300 beneficiaries in the beginning.

Additionally, the original project logistical framework was missing some activities to achieve the sub-objectives, such as the sub objective of increasing income generation, the activities to reach this goal were only with three times' training for a week including biodiversity, technical skills and entrepreneurship then purchasing and distributing the materials for the business, such as beehives.

As a result of this missing points in the activities, the communication with both beneficiaries and expected implementing partners from government were not clear in the beginning. Beneficiaries thought they would get the materials, however, the fund was not sufficient to cover the materials or training for all 1300 potential beneficiaries and training was limited to only 200 to 300 people. Even with 200 to 300 trainees, it was

extremely difficult to provide quality training and transfer the knowledge and technology with short time and only one time conducted training for three big subjects; biodiversity, technical skills and entrepreneurship.

On the side of expected government implementation partners located in Dar es Salaam, it was found that these government organizations, which are specialized with environmental assessment and research only and located far away from the project areas, especially while there are local government organizations such as Amani Natural Reserve Office and district offices already, have a lack of specialty with managing the GEBR project implementation and especially training entrepreneurship and technical skills as well as financial inclusion. The government organizations in Dar es Salaam expected to receive the fund for implementation, but UNESCO had to find expert implementing partner organizations which could support the beneficiaries directly to create the green business. These types of changes and inconsistencies lead to the change in the training model for the beneficiaries from donor-dependent to self-dependent, but which took time for the beneficiaries to accept, but which was the key point of entrepreneurship.

During the implementation, it was necessary for UNESCO to change the framework under the agreement with the government and the donor to achieve the UN goals. These changes impacted this study because the funding allocation changed from purchasing and distributing the materials, to increasing the numbers and kinds of training for the beneficiaries.

3. Recommended Future Study

While this study presented evidence on the impact of two training models on local economic development through environmentally friendly agricultural business in the communities surrounding the EUBR, additional research is recommended to observe whether these impacts of the GEER project will be sustainable and how this approach made impact on community engagement on forest management and the results of their involvement in the forest management.

The numeric data used for this thesis mainly showed the social and economic improvement in the communities around EUBR through local training and the use of revolving funds. Even if there have been some testimonials that demonstrate the change of behavior and attitudes toward natural resources such as beekeepers towards tree planning for attracting more bees or water quality management of fish farmers to produce more tilapias, there have been no assessments on the actual changes on the forest conditions, such as how much land covered by the forests increased, how much water quality was improved, how many traditional charcoal producers were reduced, how many cases of illegal mining activities were reduced, or how many local spice species were increased and produced.

Moreover, in the matter of observing the improvement on participation of these groups in the forest management, it is also important to conduct additional interview local government and the beneficiaries on how the government engages with the communities in the forest management and how the beneficiaries have changed their aspect to participate in the forest management and the reasons and the purpose of participating in the forest management as well.

Therefore, in the future study, three areas must be focused on to answer all these questions. One area is the result of implementing BR program through the green business approach to the surrounding communities of the forest to engage the community members in the forest management. The second is how each green business directly benefits and influences the forest conditions in environmental aspect. The third area is the relationship between communities' economic and social development through green business approach and environmental changes in the forest.

CHAPTER 9

CONCLUSION

The project area in East Usambara Biosphere Reserve (EUBR) in Tanzania has several characteristics and conditions that could support a successful PFM. (

First, the EUBR includes areas with national legal protections and is recognized as an internationally protected area. For example, within the EUBR, there are two forest reserves, the Amani Forest Reserve and the Nilo Forest Reserve, which have core zones that strictly limit access and local residents may only pick up the firewood only twice a week and cannot have income generation activities within the core zones such as cutting trees.. Tanzania, as one of the African countries that has an abundance of natural resources as well as protected areas, has protected 38% of its total territory (Stellmacher et al, 2012) and protected 37% of the country's total forest land (Mgaya, 2016).

Tanzania was under German colonial rule, then English, and, even after gaining independence, the style of forest protection was based on colonial principals initially aimed at forest exploitation, but recently the country has moved towards community driven protection. Because the Tanzanian government has strong laws and regulations protecting the EUBR, the government can guarantee the communities surrounding the forests to have ownership towards the forests. However, the lack of practice and guidance on implementation of PFM has been an issue.

Second, EUBR is the first Biosphere Reserve in Tanzania that has a zoning system for core, buffer and transition zones, which means there is a system that clearly recognizes each zone's different function. At the same time, the main function of having the zoning system is to limit and define the interaction with human activities, especially in the buffer and transition zones, since almost all activities are banned in the core. For this reason, to manage the Biosphere Reserves (BRs), it is necessary to mobilize the participation from the surrounding communities for designing the zones for creating guidance and regulation, and for implementing the action plans for the BR management.

Based on the literature reviews about BR management, most of the BR management plans in many countries have determined that local individuals and the indigenous knowledge and experience in the communities are the key drivers of the successful BR management. Many studies demonstrate that the capacity building of the communities is the most important factor for the BR management. Similarly, in the EUBR's case there was a strong demand to improve capacity of the surrounding communities in EUBR for better management.

Third, the economic and social condition of individuals living in and around EUBR has been considered as the poor. These conditions have also been recognized as the common situation for the most of communities surrounding the forest. In Tanzania, about 80% of the total population is living in the rural areas which includes the forest. The communities in EUBR extensively depend on the forest resources, such as harvesting herbs and fruits, producing construction materials from trees within the forest and harvesting wood for charcoal production. These activities are not diversified and degrade the environmental condition in the forest. Through previous assistance and experiences in

the communities, the community members received training to learn advanced technology for diversifying their livelihoods, such as beekeeping and tree nursery.

However, these experiences were usually short term and there was no evidence to support that these experiences made long lasting changes to improve their standard of living or result in environmental conservation through reducing the dependence on the forest resources for livelihood. Based on an assessment of these experiences and assistance implemented by external actors such as government, foreign donors, and NGOs, the lack of long-term success originated in the communities' focus on the training rather than the business practices. . The external actors provided environmentally friendly technology and knowledge for communities' livelihoods, but there were some missing points to the training model. The training may not have emphasized sustainability of the business, ensuring that the knowledge and technology were owned by the trainees, creating entrepreneurship to change the trainees' behaviors as independent small business holders, or linking communities' indigenous knowledge and systems for these activities to be more easily adopted.

Based on these three characteristics of EUBR and their influence on the forest BR management, capacity building of the communities is key to the mobilization of community members to participate in BR management and to have ownership in the process of planning and implementation of the management. Building capacity is the main solution for poverty reduction and forest conservation. In reviewing the literature, many researchers suggested capacity building included aspects such as strengthening the ownership of the forest through the legal system, funding seed money for starting up small businesses, empowering communities as decision makers, and raising awareness on

environmental issues for the communities. This study considers these recommendations and reviews different training methods and strategies for community capacity building.

This study assessed the procedures for the implementation of Green Economy in Biosphere Reserve (GEBR) Project and found that the important issues were design and implementation of the project activities focusing on the training of the beneficiaries as well as the sustainability of the expected project results, comparing the previous experience of the other activities. The overarching project of which this study as a part, was aimed at forest protection through diversifying the income generation activities which are environmentally friendly. This study addressed the significance of the GEBR training project in Tanzania in creating small green business holders as entrepreneurs and ensuring the trainees' full adaptation of the new technology and knowledge. The training also assisted trainees with developing indigenous systems that the beneficiaries own in cooperation for sharing the business, choosing the best green businesses that guarantee the market, and its creation based on experts' analysis.

Two training models were compared. The first in which the trainees were paid to attend and were given introductory materials and the second, model in which the trainees voluntarily attended, and part of materials costs were supplemented by the trainees. The initial, yet limited data, suggest that volunteer non-paid training provided for more sustainable business organizations.

This study also suggests that the sustainability of the changed mindset of the local communities as entrepreneurs and their business knowledge improved after the activities for capacity building were complete. To grow their green businesses, the beneficiaries understood that investment of profits from their business benefited their economic

situation and in some cases, such as fish farming, beekeeping and spice harvesting, maintaining or improving the local natural resources improved the community and their business success.

Though the GEBR project may have had a positive economic and social impact, especially for the beneficiaries, the lack of baseline data to measure more exact influences of the project in the EUBR on both socio-economic and environmental aspects was a limiting element. The six green businesses; beekeeping, mushroom farming, fish farming, butterfly farming, spice farming and alternative charcoal production, were evaluated as income producing and as mostly green in all steps of the value chain, although packaging and delivering of products were difficult to avoid using plastic packaging or transportation to manage long distance delivery. Moreover, all green businesses could be environmentally unfriendly if they become mass production oriented businesses. However, these limitations could be resolved in future studies through project design to allocate specific activities to achieve expected outcomes.

Therefore, this study concludes that volunteer training and an emphasis on the green business success based on team building and group associations is a preferred model for GEBR in Tanzania. Due to project limitations, understanding the impacts of GEBR on environmental matters such as changed forest conditions, community engagement in forest management, and economic and social development and the forest conditions relationships, were not observed. Therefore, this study recommends future research to be conducted to address these questions.

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