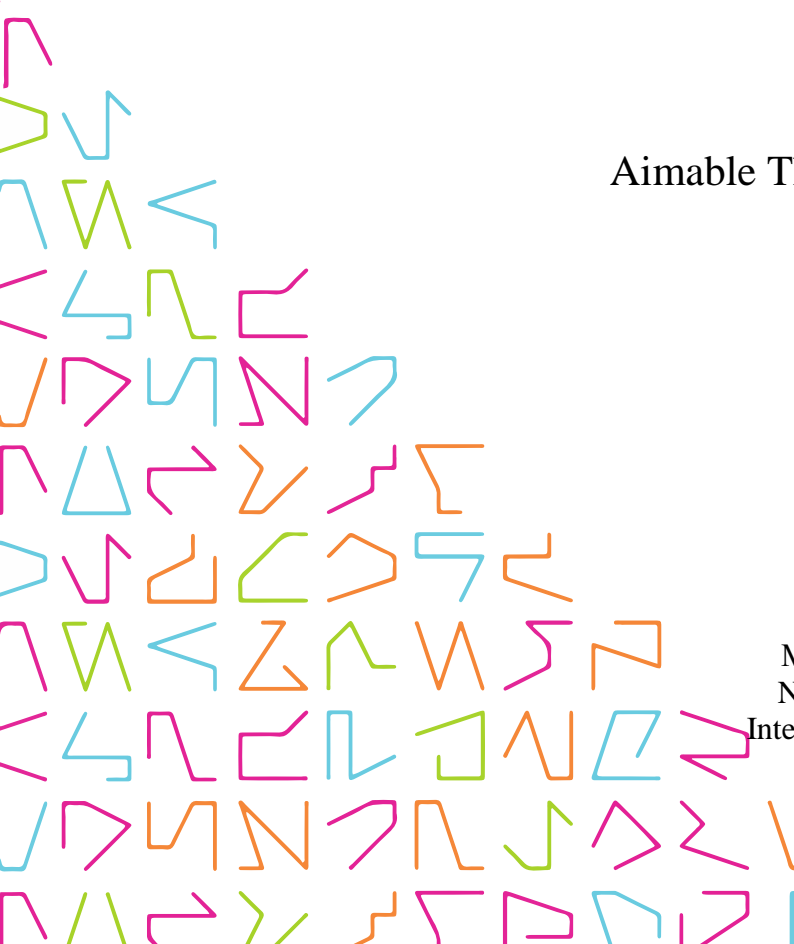


EVALUATION OF PARTICIPATORY FORESTS MANAGEMENT AND ITS CONTRIBUTION TO THE COMMUNITIES IN ZAMBIA

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ABSTRACT

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Participatory forest management is a key fact to forest conservation, and it contribute to the economy of the country in diverse options. This fact is possible but difficult due to conflicts between management objectives and the livelihood needs of local communities. This is particularly true in forest management for third world countries like Zambia, where rural populations depend directly on forest resources, which are in many cases protected. The past forest management strategies in Zambia did not allow participation of local communities in the management of forest reserves and sharing of benefits. Few years ago (1998 and 1999), the Zambia forest sector was reviewed, and people have been allowed to take part in forest management and share the derived benefits.

This study is an evaluation of Participatory Forests Management and its contribution to the communities in Zambia. This was done through a quantitative and qualitative ethnographic approach employing individual interviews, focused group discussions, and observations. The target groups included forest communities living around forest reserves as well as government forestry officials at both local and national levels. The study was based on nature-culture theory, knowledge systems theory as well as the participatory approach. Data collected were analysed mathematically and statistically by using SPSS software

The results showed that more people (68%) of the respondents were aware of participatory forest management and almost more of them (71%) participated in forest management activities. Participation of men in community forest management group activities was higher than women. Local community members with traditional leaders and the government collaborate to manage forest reserves. A small percentage of local people confirmed having improvement in household socio-economic conditions after the introduction of participatory forest management (PFM) program, and the majority perceive the Forestry Department and government to be the major beneficiary from forest reserves. There is a loss of enthusiasm for forest management among local people largely due to the insufficient of economic benefits and competition of other economic activities.

However, the relationship between local people and Forestry Department is good. It is recommended that the government through Forestry Department should continue to improve public awareness on participatory forest management programme by sensitisation and regulations setting to increase the understanding of the stakeholders and to help them become more involved in forest management. The value of the forest also needs to be enhanced to increase benefit for the local people and long-term conservation.

TABLE OF CONTENTS

1	INTRODUCTION.....	6
1.1	Background information.....	6
1.2	Problem statement.....	7
1.3	Study objectives.....	9
1.4	Research questions.....	9
1.5	Rationale of the study.....	10
1.6	Thesis structure.....	10
2	LITERATURE REVIEW.....	11
2.1	Natural resources management in Zambia.....	11
2.2	Forest resources management in Zambia.....	12
2.2.1	Pre- independence forest resources management.....	13
2.2.2	Post-independence forest resources management.....	13
2.3	Community participation in forest management.....	16
2.3.1	Meanings and typology of participation.....	17
2.3.2	Factors influencing people’s participation.....	20
2.3.3	Participatory approaches to forest management.....	21
2.3.4	Joint forest management in Zambia.....	24
2.3.5	Forest management on customary land.....	25
2.4	Forest resource in Zambia and national economy.....	26
2.5	Importance of forests to local people.....	30
2.6	Contribution of forest products to rural communities.....	31
2.6.1	Wood products.....	33
2.6.2	Non-wood forest products.....	34
2.6.3	Factors affecting the development of NWFPs.....	37
2.6.4	Other importance’s of forest reserves to local communities.....	39
2.7	Forest products market opportunities.....	40
3	METHODOLOGY.....	41
3.1	Presentation of study area.....	41
3.2	Population.....	43
3.3	Sites of survey.....	43
3.4	Data collection methods.....	46
3.4.1	Focus group discussions and key informant interviews.....	48
3.5	Data processing and analyses.....	49

4	PRESENTATION AND INTERPRETATION OF RESULTS	51
4.1	Households characteristics and categorisation	51
4.2	Awareness and participation in forest management	53
4.3	Forests importance in study area.....	56
4.4	Different activities in forest reserves	57
4.4.1	Illegal activities	57
4.4.2	Management activities	58
4.5	Benefits and benefits sharing	59
4.6	Participation and non-participation in forest management	61
4.7	Forest as part of household income and subsistence	63
4.8	Community problems, cause and solution for forest management.....	65
4.9	Perception of key informants on CFM program success	66
5	DISCUSSIONS OF THE RESULTS	68
5.1	Local community activities and their involvement in forest management 68	
5.1.1	Factors influencing people participation in FM activities.....	71
5.1.2	Local people forest management awareness	73
5.2	Importance of forest reserves.....	74
5.3	Forest reserves cost and benefits sharing in CFM program.....	75
5.4	Problems and their solutions to forest reserves management	77
5.5	Local Livelihood Socio-economic condition due to CFM program.....	78
5.6	Forest management program assessment.....	78
6	CONCLUSIONS AND RECOMMENDATIONS.....	80
6.1	Conclusions.....	80
6.2	Recommendations.....	81
	REFERENCES.....	83
	APPENDIXES	86
	Appendix 1: Survey Questionnaire	86
	Appendix 2: Protected areas, and forest reserves in Zambia	90

ABBREVIATIONS AND TERMS

CFM: Community Forest Management

CBFM: Community Based Forest Management

CBNRM: Community-Based Natural Resources Management

DFSC: Danida Forest Seed Centre

DWAF: Department of Water Affairs and Forestry

FAO: Food and Agriculture Organization

FD: Forest Department

FRA: Forest Resource Assessment

FOSA: Forestry Outlook Studies in Africa

GDP: Gross domestic product

GRZ: Government of the Republic of Zambia

JFM: Joint Forest management

MTENR: Ministry of Tourism, Environment and Natural Resources

NTFP: Non-timber forest products

NWFP: Non-Wood Forest Products

PFAP: Provincial Forestry Action Programme

PFM: Participatory Forest Management

VRMC: Village Resource Management Committee

ZAWA: Zambia Wildlife Authority

ZFAP: Zambia Forest Action Programme

1 INTRODUCTION

1.1 Background information

Zambia is one of the most forested countries in Africa, with about 50 million out of the 75 million hectares (ha) total land area, under some form of forest cover (Government of the Republic of Zambia 2014; Kalinda et al. 2013; GRZ and FAO 2009). However, the country also has one of the highest rates of deforestation and degradation in the world, estimated at 250,000-300,000 ha of forest loss per annum (Vinya et al. 2011). Reducing this high deforestation and degradation trend will require the country to design and implement programs and strategies that will effectively deal with both the proximate and underlying drivers of deforestation and degradation.

A precondition to designing such programs and strategies is a clear identification and understanding of the main drivers of deforestation, both proximate and underlying. Implementing such programs and strategies is important to help the country contribute to climate change mitigation efforts, and benefit from international climate mitigation initiatives such as the UN-REDD programme. Different studies have been conducted in the recent past to identify the main drivers of deforestation and forest degradation in Zambia (e.g., Vinya et al. 2011; Chundama 2009; Chidumayo et al. 2002). In all these studies, wood fuel production and use are identified as the top proximate drivers of deforestation and degradation, second only to agricultural expansion.

While the evidence is compelling that charcoal and firewood (collectively referred to as wood fuel in this study) is one of the major drivers of deforestation and degradation, there appears to be an under-appreciation of the role of customary land institutions in wood fuel production and/or marketing, and forest management in general. Customary land administration systems, in which forestry management systems are embedded, guide the daily management and consumption and/or use of land resources including forests. Further, land tenure directly determines who has the right to benefit from forests and who has duties to protect it (Robinson, Holland, and Naughton-Treves 2011).

While it is important to identify and address the population drivers of wood fuel production and/or marketing, what is even more important is understanding the institutional arrangements, which provide user rules and rights, as well as enforcement and sanctions/penalties for rule-breakers. Thus, it is critical that local land and forest management institutions form an integral part of analyses concerning local forest management (FOSA, 2001).

1.2 Problem statement

Rural households, particularly in Africa derive wide range of products for their subsistence from the rich and diverse vegetation type (Campbell *et al.* (1993: cited in Grundy *et al.*, 2000). In developing countries, people depend on forests and forest products such as timber, fuelwood, medicine, and food for livelihood support (ZFAP, 1998; FOSA, 2001; Sethi and Khan, 2001).

It is not possible, therefore, to have the forests for exclusive use by the State alone and deny forest-adjacent community access to the forests (Lise, 2000). The local communities particularly poorer households would continue to access and use forest resource despite not having legal right to access the forest resources. This scenario can lead to rampant deforestation and increased poverty levels among the rural communities (Jumbe and Angelsen, 2007), as the forest resources may be used in an unsustainably and in a disorderly manner. Current forest and land management practices in Zambia play a significant role to reduce and eliminate the problem of deforestation and forest degradation. They affect the sector's performance in terms of its contribution to GDP and poverty reduction, as well as its potential for carbon management (ILUA, 2008).

GRZ, 2012 stated the most common practices leading to the loss of forests. These are: Opening of new land for agriculture; production of charcoal and harvesting of wood fuel for domestic, commercial, and industrial purposes; late burning and uncontrolled fires in the dry season; uncontrolled logging of timber and over-harvesting of key species; unsustainable agricultural methods; and other land use practices, such as the expansion of settlements.

Several factors have contributed to the current state of forestry sector. Key problems in the management of the forest sector are the lack of active and full participation of key stakeholders in forest management; the difficulties in implementing policy and legal frameworks that support sustainable forest management; the lack of institutional capacity and coordination in the management of forest resources; land tenure-related issues; and poverty and other socioeconomic factors that cause rural populations to rely heavily on forests for subsistence requirements, supplementary income-generation and as a safety net in times of hardship (GRZ, 2012).

The Forest Policy and the Zambia Forestry Action Programme of 1998 state that the overall objective of the forestry sector in Zambia is to contribute to the national social and economic sectors both in quantitative and qualitative terms. At the local level, forestry contributes significantly to rural livelihoods and poverty alleviation. Studies conducted in the mid-2000s show that forestry-derived industries contribute up to 5.2 percent of the gross domestic product (GDP). This contribution is to be boosted by carbon trade through the provision of financial incentives to reduce greenhouse gas emissions (CSO 2007).

For instance, the Poverty Reduction Strategy Paper (2002-2004) discusses the sector as part of the cross-cutting issues of environment and fails to capture the analytical and policy achievements elaborated during the Zambia Forestry Action Plan and Forestry Policy and concluded that in Zambia, the role of the forest sector in economic development has not been fully recognized. To some extent, this lack of attention can be attributed to the limited availability of hard data on the sector; statistical information is fragmentary and largely outdated making it difficult to assess the sector's present and potential contributions (GRZ, 2006).

However, despite claims that Participatory Forest Management/Joint Forest Management (PFM/JFM) can contribute significantly to the improvement of forest condition and people's livelihoods, few efforts have been made to review the performance of such policy interventions. Lack of evaluation of such intervention has led to emergence of substantial gap between policies and practice (ZFD, 2005).

1.3 Study objectives

The study aims at evaluating the performance of forest reserves management, which involved the participation of local communities, Forestry Department in Zambia and different private stakeholders, assessing the benefits of local people in participation of forest management, for all to show and help decision makers and implementers to reduce the gap between policies and practices. In detail, specific objectives of this study are to:

1. Characterise the forest management activities and forest products which are integral to communities in Zambia;
2. Assess the economic activities that sustain local people and determine contribution of forest reserves management program to household;
3. Determine community perception and factors influencing their participation in FM;
4. To assess community constraints and their solutions relating to community forest management;
5. To provide recommendations based on the findings of the study.

1.4 Research questions

This research attempted to answer the following:

1. How people participate in forest reserves protection in Zambia?
2. What are factors that influence local people to participate in forests management?
3. What are benefits of local people for being participating in protection and management of the forest reserve?
4. What improvement can be done for sustainability forest management?

1.5 Rationale of the study

The community participation for forest management in recent times has been accepted as the way for sustainable management of the forest resources. It is well documented that the approach provides opportunities for local people to participate in forest conservation and management, thereby contributing to improved status of forests and the well-being of local communities (Wily, 2002). The approach is based on the concept of involving local people, whose daily lives are affected by the operation of a forest management system, in the forest management (Wily, 2001; Bhattacharya and Basnyat, 2003; PFAP, 2005). Programme evaluations are essential in assisting to identify changes, and enables progressive learning at individual, community, institutional and policy levels. This study is important to policy makers, the project implementers, donors, and community in assessing whether the goals are met and drawing some lessons on the performance.

1.6 Thesis structure

The thesis is structured in the following ways: Chapter 1 show the introduction including problem statement and objectives of the study. Chapter 2 gives an account of relevant literature reviewed for the study. Chapter 3 gives the description of the methodology. The methodology includes the description of the study area, explain tools and how data were collected and analysed, and how the research was conducted. Chapter 4 covers a report of the study results. It includes the finding of the household questionnaire, focus group discussions, interviews with key informants. Chapter 5 presents the discussion of the result based on relative references. Chapter 6 is the conclusion of the report and recommendations.

2 LITERATURE REVIEW

Chapter two provides a review of literature on forest management and utilisation; contribution of forests to people's livelihoods. The chapter also covers the concept of participatory forest management, its implementation and performance at global, regional, and national levels. The review is based on books and research articles sustaining forests management in Africa and at global level.

2.1 Natural resources management in Zambia

Community Based Natural Resources Management (CBNRM) came out with the goal of improving natural resources management and empowering local communities with the underlying assumption of sustainable rural livelihoods in the process, but its programme performance depends on a number of elements such as institutional arrangements, characteristics of the implementing agents and resource users, and the physical characteristics of the resource. The concept of community-based natural resource management (CBNRM) arose as an alternative specifically intended to address environmental, economic and social goals within a single program package (Puustajarvi *et al.* 2005).

CBNRM emphasizes the ability of user communities to effectively manage collectively owned natural resources through informal and semi-formal institutional arrangements (Wade, 1988; Baland and Platteau 1996; Ostrom, 1990). The fundamental premise is that transfer of land and land use rights from the central government to local communities improves sustainability of natural resources and enhances the welfare of rural communities. Community forestry and the more general topic of decentralized natural resource management are major themes of forest policy worldwide. North American and Western European countries establish local councils to participate in the management decisions of public forests. Experts from developed countries recommend community-based management to developing countries (Ostrom, 1990).

Rural populations everywhere find the idea of community management appealing, and current political discussions in countries as politically and demographically diverse and geographically separate as Latvia and the Czech Republic in Eastern Europe; Colombia and Mexico in Latin America; Burkina Faso and Mali, Zambia, Tanzania, Botswana and Zimbabwe in Africa; and Indonesia, the Philippines, and Vietnam in Asia debate its merits (Ostrom, 1990).

In the last two decades, Zambia has put in place policies and legislation aimed at decentralizing natural resource utilization and management responsibilities to local structures and communities and user groups. The pioneering programs started with community wildlife management in the mid-eighties and later spread to forest management. Government's commitment to natural resource decentralisation programs is clear and frequently echoed at several forums (GRZ, 2012).

2.2 Forest resources management in Zambia

Forest resource management is defined as the art and science of making decisions with regards to the organization, use and conservation of forest and related resources. A number of variables are involved in forest resource management which include biological, economical, and social (Boungiorno and Gilles, 2003). All these variables are interrelated and affect different stakeholders in a different way.

Although it is not well documented, natural resources management systems prevailed among indigenous African people before the arrival of European colonialists. Traditional institutions such as kings, chiefs, head men, and traditional healers played important roles in regulating and monitoring natural resource use through rules and procedures designed to regulate the use and management of natural resources (Matose and Wily, 1996; Fabricius, 2004).

2.2.1 Pre- independence forest resources management

Before the independence of 1964, the district forest management plans were made within a broader land use planning framework based on the overall natural resource endowments of the specific district. A natural resources inventory of a respective district was undertaken, and the forest area demarcated for use and conservation requirements (e.g. areas for wood provision for the local communities, areas for water conservation, areas for biodiversity conservation, and areas for local agricultural activities). This integrated approach ensured that the ecological, social, economic and conservation needs of the district were well catered for. The government, in collaboration with the traditional authorities, was the manager of these plans, imposing strict legally enforced rules for adherence to the land use prescriptions (Willy, 1996).

Game reserves and forest reserves were often established for the purposes of conservation, securing valuable areas against settlement, for agricultural expansion, securing water catchment areas or as a revenue generating mechanism for government. Forest reserves were established in Zambia for the purpose of conserving certain forest areas and to provide wood raw material to the surrounding communities and the industries, particularly the mines. These forest estates occur on state land, trust land or reserve land. The areas officially designated as forest reserves through legislation are about 7.2 million hectares, representing 9.6% of the country's total land area (GRZ, 1998; ZFAP, 1998; FOSA, 2001).

2.2.2 Post-independence forest resources management

The management and conservation of forest reserves in Zambia like in many African countries is the responsibility of the government through Forestry Department. Harvesting of wood products, settlements or cultivation in forest reserves is only permissible under a permit. The Forestry Department, however, does very limited forest management activities in forest reserves because of insufficient funding and reduced manpower (GRZ, 1973).

The establishment of commercial plantations in Zambia was driven mainly by the need to supplement the supply of timber from the low yielding indigenous forests and provide timber resources for the mining industry. Commercial plantations generally consist of exotic species such as Eucalyptus spp and pine (*Pinus oocarpa* and *Pinus kesiya*). Between the 1960s and the 1990s, the major plantations on the Copperbelt, were managed by the Zambia Forestry and Forest Industries Corporation (ZAFFICO), a para-state company specifically designated for the purpose. Since the 1990s, the role of the private sector has increased. ZAFFICO has been privatized with the government as the major shareholder (Matose and Wily, 1996).

Other private companies now manage some plantations as well. The main management tool for plantations is the plantation management plans that prescribe the operations to be undertaken to continuously meet the objective of their establishment. However, during colonial and post-colonial period large areas of natural forests in many developing countries, particularly in sub-Saharan Africa, were withdrawn from the local people into the hands of the state either as game reserves, forest reserves or simply state land (Matose and Wily, 1996).

The Zambian government as such undertook forestry sector review between 1987 and 1997. The review was in recognition of high deforestation rates and the inadequacies of the past forest policy to conserve and manage the forest resources. The sector review was also in line with the changing global trends in natural resource management and upon recognizing the role of stakeholders in sustainable forest resources management (ZFAP, 1998; Wily, 2001).

The review resulted in the National Forestry Policy of 1998 and the Forests Act of 1999. The new policy encouraged active involvement of stakeholders, particularly local communities, in protection, management and utilization of forest resources. The involvement of local communities in forest protection, management and sustainable use of forest resources entailed withdrawal of the exclusive powers from government to own, control, plan and manage forest reserves (GRZ, 1998; ZFAP, 1998; Wily, 2001).

Although decentralized management of local forests is not easily achieved. In fact, most developing countries lack much formal experience with decentralized management of public forests and the evidence of its success is mixed-with some great successes and some significant failures. Nonetheless, depending on institutional arrangements and the characteristics of agents (users, stakeholders) and physical characteristics of the forest resource, community forestry can potentially contribute to sustainable management and community welfare (AFF, 2011).

These characteristics or features vary from one country to another and across communities and user groups, Dangi and Hyde (2002) observe that community forestry will have the greatest impact on sustainable management and welfare when: i) forest resource values at risk exceed some critical level of importance to local users, ii) the conflict between local user groups is minimal; iii) the cost of local management are low but returns are rapid; and iv) the transfer of rights to the community is simple and complete. These characteristics have been observed in many field and laboratory environments (Ostrom, 1990; Ostrom et al, 1994; Campbell et al, 2002; Dangi and Hyde, 2001; Twyman, 2000; Dayton-Johnson; 2000) but the empirical evidence on many of these is less conclusive.

Moreover, while some scholars posit that poor villagers, compared to non-poor households, are more dependent on forest resources as sources of safety-nets and sustenance, in absolute terms, their dependency and impact on forest conditions is much lower than that of the non-poor households. Nonetheless, the characteristics of dry forests and woodlands and high levels of rural poverty create unique conditions which determine the importance of indigenous forests to local livelihood activities and the development process of rural economies. The empirical evidence of the impact of dry forests to household income is mixed (Campbell et al, 2001).

2.3 Community participation in forest management

It has been recognised that sustainable forest management cannot be achieved without the participation of key stakeholders such as rural communities, and that forests can contribute significantly to poverty alleviation among forest dependent communities (ZFAP, 1998; Wily, 2001; Belcher *et al.*, 2005; PFAP, 2005). It became evident that management of forests exclusively by central government was not sustainable as they lacked capacity both financial and human (Bojang and Reeb, 1998; Brown, 1999; Anderson, 2000; Fabricius, 2004; and Luoga 2006).

Participatory approaches to forest management were therefore adopted in order to move away from the predominant sanction and command approach. The approach offered an alternative management strategy, which uses local empowerment and capacity with the objective of uplifting local livelihoods and at the same time improving forest condition (Burkey, 1993; ZFAP, 1998; Lise, 2000; DWAF, 2004).

It responds to the immediate socio-economic needs of local people and to the long-term problems of sustainable natural resource management. Lise (2000) further pointed out that high dependence of people on forests and good forest quality enhances voluntary people's participation. It may therefore not be practical, particularly in developing countries, to have forests only for government use because many people depend on forests for basic needs such as food, wood fuel, timber, and medicines, among others. Participation of local communities in forest management is expected to lead to sustainable utilisation of forest resources (Lise, 2000; Ham *et al.*, 2008).

Local empowerment, decentralisation of decision-making and increased involvement of local communities in forest management should ultimately result in changes in forest ownership and tenure. The other expectations of CBNRM approach are rapid return on natural resource protection and management and complete transfer of rights to communities to improve local people's livelihoods. Securing benefits from forests is expected to improve livelihoods of forest dependent communities at the household, village, and community levels (Bwalya, 2004). The benefits take the form of financial returns from the sale of forest products, lease of forest resources and collection of fines.

The other benefits are secured rights over local resources; reduced vulnerability through a sustainable supply of forest goods and services and improved partnerships with external institutions such as local governments and other service providers (Blomley and Ramadhani, 2006).

2.3.1 Meanings and typology of participation

Participation implies influence, whilst to others it is empowerment; participation is largely determined by the initiators of participation and the purpose to be achieved.

The World Bank defines participation as "a process through which stakeholders influence and share control over development initiatives and the decision and resources which affect them" (World Bank).

Dolisca *et al.* (2006) define participation as an active process by which beneficiaries or client groups influence the direction and implementation of a development or natural resource management project with a view of enhancing their well-being. As indicated by Pongquan (1992) in Lise (2000), participation consists of three components, namely: contribution to, benefiting from, and involvement in decision-making and evaluation. In developmental context meaningful participation encompasses influence and empowerment (Hobley, 1996).

By sustaining participation local people should be able to organise themselves and through their own organisations they are able to identify their needs, share in design, implementation and evaluation of their activities. Meaningful participation of local people in forest management should therefore entail active involvement of forest users in planning, implementation, resource utilization, and monitoring (Coralie and White, 1994; Rishi, 2007). Meaningful participation also implies the ability to positively influence the course of events (Burkey, 1993). Cohn and Uphoff (1977: cited in Burkey, 1993) acknowledged that local participation in decision-making during implementation was even more critical to project/programme success than participation in the initial design of the project.

Fabricius (2004) further states that it is comparatively easy to get people interested in a community-based natural resources management initiative at the onset and they would attend meetings and show interest because it is something new or they are inquisitive.

However, ongoing interest and participation may call for incentives to encourage local communities and other stakeholders to participate and to manage natural resources sustainably. In conclusion, participation is a critical factor in development process (Coralie and White, 1994). However, Ravnborg and Westernmann (2002) pointed out that the concept of participation is often misunderstood to be the attendance of local people in meetings irrespective of their inputs and opinions about the issues at stake.

Murali *et al.* (2003) support the notion that inadequate local community participation can be a drawback to participatory approaches. Local people also consider participation in a development process as an investment such that they will participate in anticipation of a reward (Coralie and White, 1994; Dolisca *et al.*, 2006; Jumbe and Angelsen, 2007).

There are different types of participation, ranging from complete outside control, token involvement of local people, to a collective action of local people where own their agenda is set and implemented without outside facilitation. According to Petty *et al.* (1994) adapted in Fabricius (2004), seven types of participation are identified along the gradient of community involvement and empowerment.

At the least end of the spectrum of participation, people are merely informed and do not contribute any views, while on the upper end of the spectrum community-based programmes are self-initiated.

TABLE 1: Typology of Participation

Type	Description
Passive participation	People are informed of what is going to happen or what has already happened. The information being shared belongs only to the external people and no response is expected from the audience.
Manipulative participation	Participation is not as genuine as it seems to be, or it is a deception
Participation in information giving	People answer questions, questionnaire survey or similar approaches. People do not have opportunity to influence proceedings. Findings are neither shared nor checked for accuracy
Participation by consultancy	People are consulted, and external agents obtain their views. But external agents define the problems and solutions and may modify in light of the response from the people. The external agents do not concede any share in decision-making and are under no obligation
Participation for material incentives	People provide resources such as labour or materials for a project in return for food, cash or other material incentives
Functional participation	People form groups to meet predetermined objectives such as establishment of externally initiated committees. Initially dependent upon external initiators and facilitators and may become self-dependent.
Interactive participation	Joint analysis leading to action plan and formation of new local groups or strengthening existing ones. Involves interdisciplinary methodologies, multiple perspectives and learning processes. Groups take control over local decisions; people have a stake in maintenance of the structures
Self-mobilisation	Initiatives taken independently of external institutions.

Source: Fabricius (2004)

In cases where the State lacks the capacity to manage and protect natural resources or where there is need to uplift livelihoods of local people, genuine participation of the local communities living around the resource is a key to sustainable management. Lise (2000) acknowledged that forests are better managed when people's participation is secured. However, participation can also be a manipulative tool to manage people in predetermined process (Castrol and Nielsen, 2001).

The level of participation can also be vertical or horizontal. According to DalalClayton *et al.* (2003), horizontal participation involves interactions on an issue across sectoral interest groups. Conversely, vertical participation refers to interaction on an issue throughout the hierarchy of decision-making such as from national to local levels or from leaders to marginalized groups. Dalal-Clayton *et al.* (2003) further indicated that the deeper the vertical participation within a given institution, the better would be the understanding and support for the strategy.

2.3.2 Factors influencing people's participation

Participation must not just be a policy statement, but it must be accompanied by genuine commitment to encourage participation in all aspects and at all levels. It is important to know conditions under which voluntary participation takes place and those factors that affect people's participation. Coralie and White (1994) indicated that there were many critical factors that could affect people's participation.

There are several pre-requisites for effective community participation in natural resources management. There are also several key factors that would affect voluntary and active participation. People's participation is dependent on norms, values, skills, qualification and personal qualities of resource users and the proximity to the resource. It is also dependent on institutional arrangements in the community, the degree of market integration, and the local economic environment.

The extent of participation of forest dependent communities in forest protection and management depends on the relative importance of forest resources for sustainable livelihoods. It has been reported that participation of local people in forest management increases where forest conditions were good and when local people were more dependent on the forests (Lise, 2000; Jumbe and Angelsen, 2007). However, the high forest dependency at times reduces incentives for community participation where there is a heterogeneous community social structure and more commercial uses of forest (Jumbe and Angelsen, 2007).

Proximity of local community to the resource and to the forestry offices has also a positive effect on local people's participation and subsequent success of the programme. Holmes (2007), during a similar study in the Eastern Cape province of South Africa, observed that the further the forestry offices are from the resource and the community, the less they interact with the local communities.

Similarly, the further the communities are far from the forest resource, the less they interact with the resources. Interaction is essential in PFM/JFM because it enhances sharing of information, creation of mutual relations, and builds trust and confidence among the concerned parties.

2.3.3 Participatory approaches to forest management

There has been a long history of participatory approach to forest management in India, Nepal and elsewhere in Asia. In India, participatory approach to forest management was started when it was introduced in different states as a participatory tool to conserve and manage forest resources in a sustainable way. But experiments were already underway elsewhere to involve rural people living in the periphery of forests in the management of forest resources in the early 1970s (Rishi, 2007). Participatory approach to natural resource management came about as an alternative approach to address environmental, social, and economic concerns (Jumbe and Angelsen, 2007).

Participatory approach to forest management was initiated upon realisation that the old forest protection system of policing to manage and protect the forest resource was not successful in the protection of forests and in responding to the needs of rural communities. Saxena (1992) and Joshi (1999) also reported that the early experience in West Bengal State of India in the 1970s revealed that successful forest management and conservation occurred when forestry personnel collaborated with rural communities living around State forests.

The new approach also was reported to have led to change of attitude among local people towards forestry personnel from the hostile relationship that had existed before due to the policing approach that the forestry department had adopted (Rishi, 2007). The demand for change in forest resources management system was also largely influenced and driven by global and international concerns over the future of forests and failure of central governments to stop or reverse the loss of forest resources (Odera, 2004). Most of the international agreements that facilitated CBNRM emanate from the United Nations Conference on Environment and Development (UNCED), referred to as the Earth Summit, which was held in Rio de Janeiro in Brazil in 1992 where global conflict between economic development and environmental protection was discussed. Participatory development has since been accepted as an integral part of development strategy (Jumbe and Angelson, 2007).

Participatory forest management or joint forest management has many definitions, but in summary it is defined as the management of forests in collaboration with government and forest-adjacent communities (Blomley and Ramadhani, 2006; FBD, 2003; FD, 2003; PFAP, 2005). Ham *et al.* (2008) also define participatory forest management as the sharing of responsibilities, control, resource and decision-making authority over forestland between Forestry Department and local user groups. PFM encompasses all participatory approaches to forest management. It incorporates collaborative forest management, community forests, shared forest management and joint forest management, among others (Hobley, 1996; FBD, 2003; PFAP, 2005).

The approach also incorporates different perspectives, interests, and interaction of different stakeholders with the forest environment and beyond forest resources (Hobley, 1996; PFAP, 2005; Rishi, 2007). The underlying principle of JFM is based on the assumption that a willing and active partnership between State and local community can promote conservation through sustainable management of forest resources (Murali *et al.*, 2003). It encourages the development of partnership between the State forest agency and local people to manage forest resources jointly through legalised access by communities to forest and woodland area (Lise, 2000; Ham *et al.*, 2008). This enhances mutual trust between the State and the participating local people, and among the local people so that mutual participation is sustained (Lise, 2000).

On the other hand, PFM is supposed to improve the forest condition in terms of increased forest regeneration, availability of forest products, availability of valuable tree species, and reduced rate of illegal forestry activities (PFAP, 2005). The success in west Bengal and other States in India in reversing forest degradation resulted in the adoption of national JFM resolution, a move from policing and protection to collaboration (Joshi, 1999). Involvement of various stakeholders, especially local communities, in natural resource management projects also has generated successful and sustainable results in several West African countries, such as Benin, Burkina Faso, Cote d'Ivoire and Mali (World Bank, 1998). The involvement of communities in forest management is now a significant feature of national forestry policies and practices and of internationally supported programmes throughout the world (Fisher, 1999; Shackleton *et al.*, 2002).

The policies and legislations of other sectors, such as wildlife, land, agriculture and cooperatives, water development, decentralization, resettlement, and energy have also had an influence on the implementation of CBFM. Although the ADMADE programme was centred on wildlife, was the earliest and influential initiative in Zambia to enable local people to participate in and benefit from natural resource management (Bwalya, 2004; PFAP, 2005; Olson, 2007). The programme was implemented in Game Management Areas (GMAs), the semi-protected areas adjacent to national parks, with the basic idea that local communities would be involved in decision-making process and assist in the conservation of wildlife resource.

In return, residents would receive a share of revenues generated from the protected areas in their area for investment in the local economy and establish a system of user rights with defined access to wildlife resources (Olson, 2007). The experiences of PFM in Zambia were also drawn from the Tanzanian PFM model though decentralization processes are different between the two countries (FBD, 2003; PFAP, 2005).

Two forms of participatory forest management are recognized in Zambia: joint forest management and community forest management on customary land (FD, 2004; PFAP, 2005). It is aimed at developing partnerships between local communities and Forestry Department for the sustainable use and management of forest areas on the basis of trust and mutually defined rights and responsibilities for both parties (Hobley, 1996).

The involvement of local communities in forest protection and management is also expected to reduce management costs, create positive impact on quality of forest resources; and improve livelihoods of local people over time (Murali *et al.*, 2003; PFAP, 2005). In contrast, community forest management is referred to as the management of forestland under control and ownership of local communities (FBD, 2003; FD, 2004; PFAP, 2005; Blomley and Ramadhani, 2006). It takes place in forests on village or traditional land and the local residents take full ownership and management responsibility for the forest area within their jurisdiction (Blomley and Ramadhani, 2006).

2.3.4 Joint forest management in Zambia

JFM is an approach that divides management responsibility and returns in designated local forests between government and forest adjacent communities. Key points towards the rationale for formation of JFM include, the subsistence and commercial use of forest products according to management plans; employment opportunities; promotion of technical, organisational and marketing skills; and the contribution to sustainable land use planning. The management tool is a management plan developed in a participatory manner, called the Joint Forest Management Plan that provides the operational and management prescriptions for how the areas are to be managed (PFAP, 2005).

The Statutory Instruments under which the JFM areas were created (SI No. 52 of 1999; and SI No. 47 of 2006) allow for the formation of Community Trusts that establish partnerships with government and other stakeholders (e.g private sector and NGOs) in the management of the JFM area. Currently Joint Forest Management Plans have been developed for seven pilot forest areas (PFAP, 2005).

2.3.5 Forest management on customary land

The documentation on forest protection and maintenance under traditional forest management regimes in Zambia and East and Southern Africa in general is patchy. There is rich anecdotal evidence of forest management practices upheld by the traditional authorities (e.g. the Litunga of the Lozi, the Citimukulu of the Bemba, and the Mwata Kazembe of the Lunda in Luapula) for regulating the use of important wild harvested products and in the process conserving the forest. At the household level, people have protected natural woodlots around their homesteads. These woodlots are maintained by thinning out undesirable shrubs and other trees (Chidumayo, 1997b).

The scarcity of valuable wood products from indigenous forests is also forcing some farmers in eastern Zambia to protect re-growth (Chidumayo, 2009) in fallows by regulating wood harvesting (personal observations), protecting valuable species in and around fields and homes, and retaining strips of woodland on fields. In some cases, management of forests in customary areas by taboo or religious sanctions has ensured the survival of valuable trees and woodland areas. Taboos on cutting fruit trees or trees associated with ancestral spirits are widely referred to in inquiries about why certain species are protected from indiscriminate cutting. Among the Tonga of southern Zambia, the cutting of trees associated with spirits is strictly prohibited (Olsen 1992; Sorensen 1993).

Sacred groves used for male circumcision, rainmaking ceremonies, meeting places for elders, burial grounds, and natural springs have been protected in parts of Zambia. The Muzauli tree species in the Western Province is protected by tradition. Controls on the use of scarce forest resources in the customary lands in the Southern Province were aimed at preventing outsiders from exploiting certain tree species, while free access by local people continued unaffected. Often when such controls fail to function, open access regimes emerge and can result in the overexploitation and eventual disappearance of forest resources. While most of the forests and woodlands in Zambia are found on customary land there is still no systematic or purposeful institutional and management planning for the sustainable use and conservation of forests under customary lands (Sorensen, 1993).

2.4 Forest resource in Zambia and national economy

Forests play a crucial role in enhancing human well-being and in sustaining the economy of Zambia. They contribute to economic growth, employment, wealth, export revenues, a stable supply of clean water, recreation, and tourism opportunities, as well as essential building materials and energy for a wide range of economic sectors. However, Zambia has one of the highest per capita deforestation rates in Africa. The Government's efforts to reduce emissions from deforestation and forest degradation and increase the role of conservation, sustainable management of forests and enhancement of forest carbon stocks (REDD+) have the potential to halt the rate of deforestation in the country (FD, 2005).

This can happen if the country manages to successfully implement its national strategy to reduce emissions from deforestation and forest degradation, and, thereby, leverage financing and investments opportunities for REDD+ implementation including through results-based payments. Actions to reduce deforestation could be an important catalysing factor for the country to transition to a Green Economy, especially if REDD+ implementation is embedded in the country's ambitious development and economic objectives. Thus, the potential is great for the forestry sector to play a very important role in the country achieving its Vision 2030 goals (FD, 2005).

In 2004, the forest sector (including forestry and forest industries) was estimated to contribute 3.7% to country GDP. Charcoal production generates by far the largest value added in the sector, 2.2% of the national total. Fuelwood production accounts for 0.8% and household production of timber for 0.3%. Forest industries' contribution stands at 0.3% (including both primary and secondary processing), but, as mentioned, this is likely to be an underestimate. The same applies to the contribution from non-timber forest products. The above estimates include subsistence consumption valued at market prices (CSO, 2004).

There are no estimates on the proportion of commercially sold amounts but based on information available on cooking fuels (CSO 2004, p. 138), it may be conferred that commercially traded fuelwood probably accounts for only about 5 per cent of the total market value, whereas for charcoal this proportion is much higher, possibly up to 90 per cent. The preliminary estimates on Zambian GDP for 2004 (in 1994 constant prices) indicate that agriculture contributed 7.2%, fisheries 2.6%, and mining 8.2% (CSO, 2004).

TABLE 2: Contribution of Forest Sector to Zambia GDP in 2004, (CSO, 2004)

	Value added		Share of GDP %
	K mill	USD mill	
Total country GDP	25 704 400	108.5	100
<i>Of which</i>			
Total forestry and forest industries	942 268	208.9	3.7
<i>Sub-sector contributions</i>			
- Fuelwood production	209 123	46.5	0.8
- Charcoal production	569 315	126.5	2.2
- Household production of timber	83 738	18.6	0.3
- Non-timber forest products*	246	0.1	-
- Primary industrial processing*	58 274	12.5	0.2
- Secondary industrial processing*	21 573	4.8	0.1

* likely to be underestimates

Timber production for household consumption is likely to be largely subsistence use. In total, it may be estimated that subsistence production represents about 35% of the sector's total contribution to the GDP.

Compared to other primary sectors, the contribution from the forest sector is in the middle group, below the highest but above the lowest contributions (FAO,2004).

The household unit, which is the most common production and consumption unit in rural areas in Zambia, is therefore more reliable as a measure of forest contribution than per capital income. The number of people in households is 5.5-6.2 depending on the province. In 2003-2004, the average annual household income in small-scale households was 720\$ (Table 2). Forest contribution to subsistence and cash income was 91.8\$ and 52.2\$ respectively. In total, forest-based income adds up to K648 000 (USD 144)

TABLE 3: Forest Contribution to Rural Income in Zambia 2003-2004 (FAO,2004)

Type of income	Annual average per household		Aggregate income*	
	K	USD	K mill.	USD mill
Rural small-scale household income	3 240 000	720.0	4 207 500	935
Value of forest contribution to rural subsistence income	413 100	91.8	567 000	126
Value of forest contribution to rural cash income	234 900	52.2	319 500	71
Total forest contribution to rural income	648 000	144.0	886 500 (787 500)**	197 (175)**

K= Zambia Kwacha Currency

* Number of small-scale households in 2004 was estimated at 1 368 799.

** The impact of forest degradation may not have been captured in the computed estimates.

At aggregate level, the annual household income in rural areas is estimated at K4 207 500 mill. (USD 935 mill.). Forest contribution to subsistence income represents a total of K567 000 mill. (USD 126 mill.), and the total forest-based cash income amounts to K319 500 mill. (USD 71 mill.).

In total, forests contribute K886 500 mill. (USD 197 mill.) to rural household incomes. There is considerable uncertainty in these figures, and an assessment applying an alternative methodology suggests that forest degradation may have reduced the total forest contribution to only K787 500 mill. (USD 175 mill.). (FAO, 204).

Forest-based subsistence income represents 12.75% of total income. Contribution of forest-based cash income amounts to 7.25%.

In sum, the forest-based contribution accounts for about 20% of total rural income. Other rural income is mainly provided by agriculture considered as substance income (38.25%) and other economic activities contribute 41.75% of income.

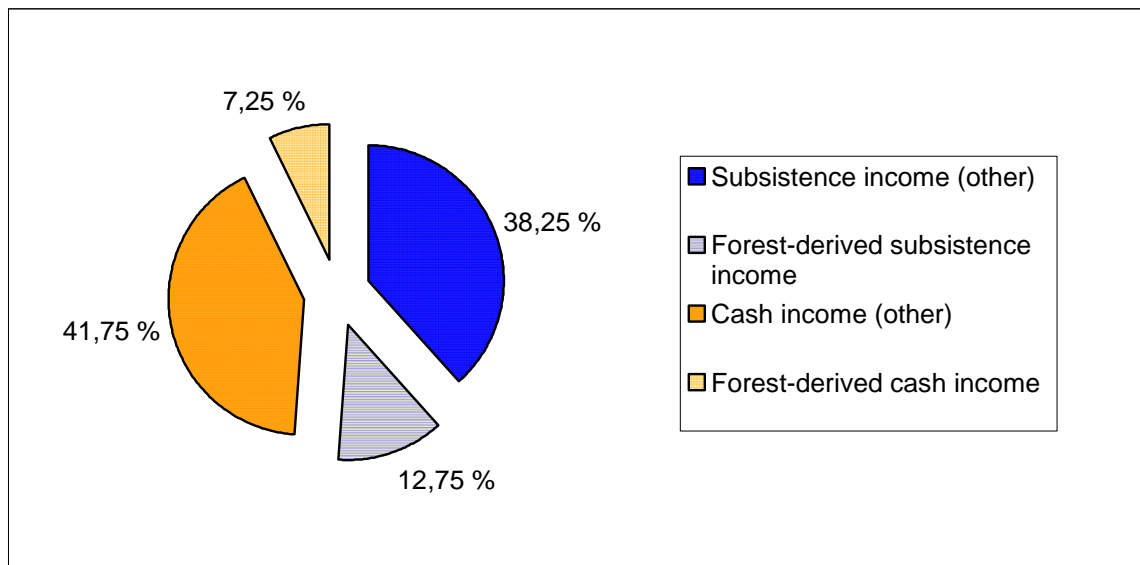


FIGURE 1: Proportion of Forest Contribution to Rural Income in Zambia, 2003-2004

Source: Savcor 2004

2.5 Importance of forests to local people

Forests play an important role in people's livelihoods as they provide a wide range of products and services (PFAP, 1998; Campbell *et al.* (1993: cited in Grundy *et al.*, 2000); FD, 2005; FAO, 2007). There are major sources of food, wood fuel, building materials, and traditional medicines. They also play vital role in carbon sequestration, hydrological cycles, and are key factors in watershed and soil conservation (GRZ, 1998; FAO, 2007).

The role of forests in local people's livelihoods cannot be over emphasised. Carney (1998) defined livelihood as the capacities, assets and activities required to achieve a means for living. According to DFID (2001), livelihood strategies denote a range and combination of activities and choices that people make to achieve their livelihood goals. Livelihood becomes sustainable if it can cope with and recover from stresses and disturbances and maintain or enhance its capabilities for now and in the future. In rural Zambia, the primary livelihood system is subsistence and semi-subsistence agriculture (Olson, 2007; FD, 2005).

A wide range of agricultural crops are grown such as maize, millet, cassava, finger millet, sweet potatoes, and vegetables. Off-farm income generating activities for sustaining local livelihoods are also available and they include beer brewing, petty trade, and casual labour (PFAP, 1998). A wide range of forest products are also collected and utilised by local people, some of which are traded and form an important source of income to supplement household income. Forests are also important in improving people's physical well-being using traditional medicine. The use of traditional medicines is widespread among rural people. This is attributed to the lack of money to purchase drugs, cultural preference for traditional healing practices, and poor distribution and service of rural health facilities (PFAP, 1998).

Furthermore, forests sustain rural people's livelihoods through soil conservation, protection of water catchment areas, provision of grazing areas for livestock, for soil conservation, and provision of wood energy (FAO, 2007). About 88% of the households in Zambia rely on wood energy sources (PFAP, 1998). Firewood forms the common domestic fuel source for the rural community and charcoal is the major source of wood energy in urban community and its demand is on the increase (PFAP, 1998; Puustjärvi *et al.*, 2005).

Sustainable use of forest resources is critical for people's livelihoods. The poor rural communities tend to be the most vulnerable to the effects of environmental degradation (Warner, 2000). According to 2003 Poverty Reduction Strategy Paper (PRSP), the average poverty level in Zambia stood at 73% of which rural areas had a prevalence of 83% and urban areas 56% (GRZ, 2003). Rural households reduce their vulnerability by deriving food security and increase household income from forests (Olson, 2007; Warner, 2000).

As supported by Murali *et al.* (2003) and Bwalya (2004), the degree of dependence on forests and forest products is high among poorer households in the community. Forests reduce the vulnerability of households by acting as safety net in time of needs (Warner, 2000; Arnold, 2001; Bwalya, 2004; Olson, 2007).

2.6 Contribution of forest products to rural communities

The contribution of forest products is particularly important to rural communities in terms of energy production, food and nutritional requirements, medicines, fodder for livestock, gums, fibre, construction materials and related domestic requirements, also many forest products like honey, wax and bamboo generate income to rural communities once they are marketed (Chikamai and Tchatat, 2004; Tieguhong and Ndoye, 2004; FAO, 2000).

Sustainable harvesting of forest products is seen as an effective management approach that allows local people to meet and sustain their livelihoods while contributing to forest conservation; hence, in promoting the sustainable use of forest products one is improving the conservation of forest resources as these play a crucial role in the local communities' lives by providing basic needs (SCBD, 2001; Peters, 1999; Leakey *et al.*, 1996).

There are many different types of products gathered from forests, these include non-wood forest products and wood forest products. Forest also provide the habitat for many commonly consumed wild animals and fish. Forest foods may also be smoked, dried or fermented, making them available over extended periods of time (Arnold, 1988).

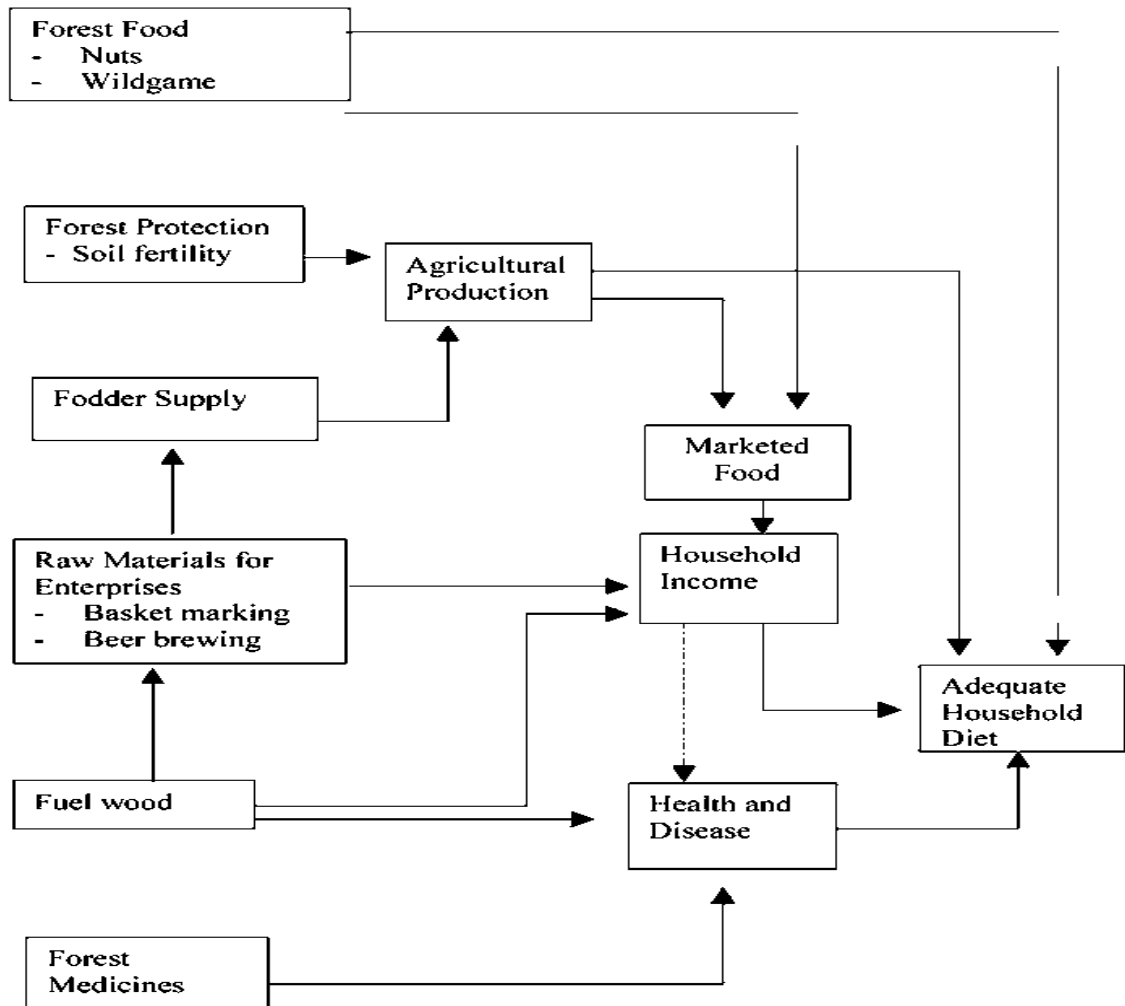


FIGURE 2: Flow Chart showing the classification of forest products and services

Source: F.A.O (2006)

2.6.1 Wood products

The value added in fuelwood and charcoal production was estimated based on data from a field survey carried out by Forestry Support Project in 2003 (FSP 2003). A few adjustments to the data set were made to reflect conditions in 2004.

TABLE 4: Value Added in Fuelwood and Charcoal Production in 2004, (FAO, 2004)

Type of fuel	Consumption	Unit price	Trade value		Value added	
			K mill.	USD mill.	K mill.	USD mill.
Fuelwood	2 383 000 m ³	K 117 000 /m ³	278 831	62	209 123	46
Charcoal	2 564 mill. Kg	K 18 500 / 50 kg bag	948 859	211	569 315	127

The total volume of fuelwood production was estimated at 2 838 000 m³, while charcoal production amounted to 2 924 mill kg.

The value added of fuelwood production stood at K209 123 mill. (USD 46 mill.), and that of charcoal production at K569 315 mill. (USD 127 mill.)

Apart from fuelwood and charcoal, households produce and consume substantial quantities of timber that is processed to saw logs and various other products. Estimates on these volumes were generated based on consumption data collected by Provincial Forestry Action Plan (PFAP) in mid-1990s (Annex 4). Total roundwood production was estimated at 400 000 m³/a for logs, at 92 000 m³/a for poles and 155 000 m³/a for “other” wood.

It was assumed that saw logs would be converted to sawn timber by pit sawyers. Other wood consists of logs used for making carvings (usually dead wood), furniture, tool handles etc., and it was assumed that conversion loss would be similar to that occurring in pit sawing.

As no updated market data was available, prices for 2000-2003 were applied from Mietinen (2004). The lower end of the price scale was applied.

TABLE 5: Value Added in Production of Timber for Household Production in 2004, (FAO, 2009)

Assortment	Roundwood	Volume after pro- cessing	Unit price		Trade value		Value added	
	m ³		m ³	K/m ³	USD/m ³	K mill.	USD mill.	K mill.
Logs/Sawn timber	400 356	140 124	517 000	110	72 444	15.4	47 089	10.0
Poles	92 203	92 203	376 000	80	34 668	7.4	26 001	5.5
Other wood/processed goods	155 289	54 351	352 500	75	19 159	4.1	14 369	3.1
Total	647 848				126 272	26.9	87 459	18.6

Production of sawn timber accounts for the highest value added, K47 000 mill. (USD 10.0 mill.) followed by poles and goods processed from other wood, K26 000 mill. (USD 5.5) and K14 000 mill. (USD 3.1 mill).

2.6.2 Non-wood forest products

Non-wood forest products (NWFPs) have been defined as "all goods of biological origin other than wood in all its forms, as well as services derived from forest or any land under similar use. In many parts of the world, these products still play an important biological and social role in local food systems. They can contribute substantially to nutrition, either as part of the family diet or as a mean to achieve household food security. They can also improve health through the prevention and treatment of diseases. Poor households residing in and around forest areas particularly landless people, women and children depend to a greater or lesser extent on the exploitation of common property forest resources in their everyday life or in periods of crisis (FAO, 2009).

Since NWFPs are essentially part of local subsistence economies, they have not received the required attention in development planning and in nutrition improvement programs of the population group which depends on them. As a result, their potential contribution to human welfare remains unrealized. Although one should not expect forest foods to ensure food self-sufficiency of the local population, they can nevertheless constitute an important element of sustainable diets, i.e. balanced diets based on local foods which can be obtained in a sustainable way. Such resources which are often seen as relics of the past should actually be considered as underexploited opportunities for the future. Forest foods or bush foods are often associated with wild or uncultivated plants and animals. The dichotomy between wild and domesticated is however; often artificial as the analysis of local farming systems in forested areas worldwide shows a continuum from subsistence foraging to commercial agriculture. There is no clear dividing line between foraging and agriculture (FAO, 2009).

Another feature that needs to be recognised at this stage is the way that different NWFP activities are linked as components of livelihood strategies that households employ. The concept of food security for rural households in developing countries encompasses all factors affecting a household's access to an adequate supply of food. Thus, it is concerned not just with the household's production of food crops, but with the availability of income to the household with which to purchase food, where this is necessary. In examining household use of NWFPs, we therefore need to identify their effectiveness in both providing gathered foods that contribute to food self-sufficiency, and saleable products that could supplement income needed to purchase food. In doing so it is also necessary to consider whether, and if so how, income-generating activities based on forest products affect other aspects of a household's capacity to contribute to its food self-sufficiency (Longhurst, 1987).

Increased commercialization of forest food products could lead to over-exploitation of the resource, or to diversion of food needed for household consumption from local use to sale on the markets. Households may sell not only what is surplus to their requirements but also food needed in the household (Longhurst, 1987).

Changes in use of agricultural or grazing land to favor production of NWFPs for sale could reduce the amount of land available to the household for producing its basic food crops. Introduction of time consuming NWFp gathering or processing activities could be at the expense of time women need to cook and look after their children (Longhurst, 1987).

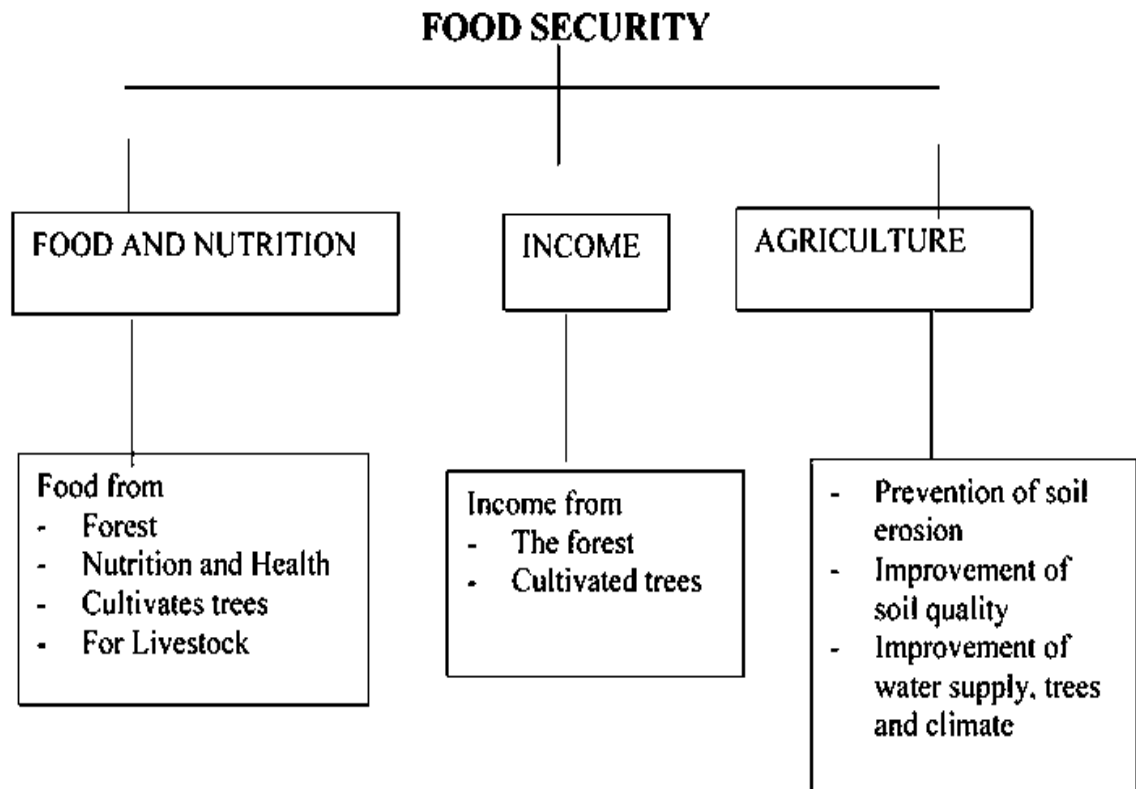


FIGURE 3: Flowchart on Forest Products and Household Food Security, (FAO 1992)

People rely on a wide range of forest products for their own use. However, it needs to be kept in mind that there are many other materials and products that are used in lesser quantities. To get an overview of useful plants and animals, it is helpful to divide them up into categories related to their use and these categories assist researchers and NGOs in making inventories of useful plants in a certain region. (Andel, 2006).

2.6.3 Factors affecting the development of NWFPs

Traditionally, maximizing revenue from timber production has driven forest policy and management decisions in many countries and silvicultural systems have been designed specifically to enhance timber production. These policies and practices have in some places conflicted with the interests of forest dwellers and people dependent on the forest for other uses, products and have limited the development potential of NWFPs. With the increased recognition of the importance of NWFPs, however, more attention is being put on the development of forest management systems for sustainable use of both wood and non-wood products and services and to ensuring equitable distribution of the benefits ((FAO, 2009).

The development of NWFPs has been limited, however, by the lack of accurate data on production and trade and also by weaknesses in the policy and institutional structures needed to support it. The economic importance of NWFPs is generally underestimated because much of the production and consumption is at subsistence level, and thus, data are rarely collected or published at a national level. When data on NWFPs are recorded, underreporting, double counting, grouping of NWFPs at different stages of processing or together with other products, and the use of unrealistic prices are systematic shortcomings of such statistics. Clearly, improved statistical information will both clarify the economic significance of NWFPs and their trends, and provide essential information for management purposes (FAO,2009).

Despite the growing attention given in many countries to the promotion and development of NWFPs, it is presently impossible to assess whether their socio-economic contribution has become important. This is not only because of the lack of reliable time series of production and trade data for the majority NWFPs but is also due to the difficulty of differentiating production and trade from agricultural sources. The potential for increased commercialization of NWFPs, however, would appear to be large if judged simply by the number of plant and animal products of known value for human use. Successful (and sustainable) commercialization of a NWFP that is currently collected and used in the household or sold in small quantities in a local market, however, is extremely difficult (FAO,2009).

There are a range of technical needs, and social and economic implications involved in doing so, and improved marketing processes and structures are essential. A number of important issues are being grappled with in current efforts to tap the economic potential of NWFPs. These include:

- The need to develop suitable management systems to avoid over-harvesting of the product in the wild;
- Clarification of user rights over the resource, particularly where it is considered common property;
- Research and development needs in semi-domesticating or domesticating a wild resource;
- Development of effective marketing systems for the product;
- Various legal issues, including intellectual property rights and patent rights in the case of research of an active ingredient from a national product leading to its synthesis (FAO, 2009).

Much of the current effort on NWFP development, such as the establishment of extractive reserves, is focusing on providing or increasing alternative sources of income for forest dwellers or poor populations living near the forest. Large-scale commercialization of a product is neither guaranteed to benefit these people nor to protect the resource. It may not even be technically feasible or economically viable. Consistent policies and support which specifically govern the management, harvesting and processing of NWFPs are lacking in most countries, but some (e.g., Indonesia, India and Turkey) have recently made some effort to redress this. Overall, the development and implementation of national policy frameworks to support the development of NWFPs remains a major challenge (FAO,2009).

2.6.4 Other importance's of forest reserves to local communities

Forest reserves have an important role in rural employment and income generation, mostly in the informal sector. A survey of a heavily forested zone in southern Ghana showed that 10 percent of the rural population gains some income from activities in the NWFP value chain. Rural women are particularly involved in gathering and processing NWFPs and are likely to be the main beneficiaries or losers from forest resource management interventions in Central Africa that may affect free access to the forests (FAO,2000).

Most rural households in developing countries, and a large proportion of rural households, use forest products to meet some part of their nutritional, health, house construction, or other needs. Very large numbers of households also generate some of their income from selling forest products. Most people are continuously adapting their livelihood strategies to changing circumstances, and this can mean that the role of NWFPs is changing, often very rapidly; some people turning to greater use of such products as their circumstances change, others moving to use of alternative products or materials, or to different activities. It is necessary to be also able to identify the directions of these changes and the factors underlying them (Williams, 1996 quoted by SCBD, 2001; Shackleton *et al.*, 2000).

NWFPs contribute substantially to national economic growth and international trade as they have the potential of being marketed and thus providing rural people with cash income without the need of clearing the forest; traded products contribute to the fulfillment of daily needs and provide employment as well as income, particularly for rural people and especially women. A significant source of income supports community welfare (Chikamai and Tchatat, 2004; FAO, 2000; Leakey *et al.*, 1996).

The sustainable utilization of NWPs provides a unique way to use the rich tropical forest species for profit and still conserve most of the biological diversity. No other uses practiced in the tropics have the potential to do so (Peters, 1999). Conservation and long-term utilization of NWFPs can only be realized if they are harvested on an ecologically sustainable basis (Peters, 1999; Tchatat, 1999). The extraction of wild plant products is considered sustainable if it has no long-term harmful effect on their regeneration and when the yield remains more or less constant for long; sustained harvest depends much on the part of the plant harvested (Shackleton *et al.*, 2000).

NWFPs have also the potential in resolving conflicts around protect areas, between communities and park authorities, and among communities over resources and their uses (Taylor, 1999). Establishing a good relationship and winning the trust of local communities has been shown to contribute significantly to conservation (Chikamai and Tchatat, 2004). Development of enterprises based on NWFPs have been shown as one way of making forest use more sustainable because they extend the range of forest benefits and as gathering, and processing activities can be managed by communities near the forest resource with a greater proportion of the end-product revenues returning to those who manage the resource (Taylor, 1999 quoted by Chikamai and Tchatat, 2004).

In addition, the controlled exploitation of NWFPs holds great potential as a method of conservation of tropical forests in linking protected area management with the needs of nearby communities through limited and controlled use; nowadays, numerous ongoing projects promote NWFPs use and commercialization as a means of improving the well-being of rural populations and while conserving existing forests (FAO, 2003b; FAO, 2000).

2.7 Forest products market opportunities

Market opportunities for forest products can also influence community participation and the eventual success of PFM/JFM. Areas with very high market opportunities, such as proximity to urban settlements, may cause proliferation of illegal and unsustainable activities such as timber harvesting and charcoal production among forest-adjacent communities. On the other hand, areas with weak market opportunities, possibly due to poor road network or long distance to the market, local forest-adjacent communities may become discouraged although the forest products may be in abundance. Furthermore, illegal harvesting of forest products from open areas located near a JFM area and at low costs, may discourage local communities to market forest produce from JFM area at reasonable prices (Blomley and Ramadhani, 2006). This may subsequently affect their participation in JFM activities.

3 METHODOLOGY

3.1 Presentation of study area

The Republic of Zambia is located in south-central Africa and lies between latitudes 8° and 18° South and between longitudes 22° and 34° East. It is bordered on the northwest by the Democratic Republic of the Congo; north-east by Tanzania; on the east by Malawi; on the south-east by Mozambique; on the south by Zimbabwe, Botswana, and the Caprivi Strip of Namibia; and on the west by Angola. The country is administratively divided into nine provinces namely, Central, Copperbelt, Eastern, Luapula, Lusaka, Northern, North-western, Southern, and Western provinces (CSO, 2003; FOSA, 2001).



FIGURE 4: Map of Zambia, (CSO, 2003).

Zambia consists largely of a highland plateau, which rises in the east. Elevations range from 915 – 1,520 m. Higher altitudes are attained in the Muchinga Mountains, where Zambia's highest point is located at unnamed location in Mafinga Hills at 2,301 m., and the lowest point is the Zambezi River in the southeast at 329 m. (Aregheore, 2006). The mean altitude is about 1,200 m above sea level. The climatic conditions are subtropical in nature, although the country lies within the tropical zone because the country's climate is modified by high altitude. There are three seasons: Cool and dry season from May to August; hot and dry season from August to November; and warm wet season lasts from November until April. July is usually the coldest month of the year with occasional ground frost occurring in sheltered valleys (FAO, 2007).

The average temperature during July is 17.2°C. The hot and dry season is a period of rapidly rising temperatures, and October is usually the hottest with the average temperature of 30°C, but if the rains are delayed November can be hotter. The annual rainfall ranges from 760 mm in the southern part of the country to over 1,250 mm in the north (FAO, 2007; "Zambia", Microsoft Encarta, 2008). The rain is usually during the period of November to March varying in amount with latitude and altitude (FOSA, 2001). December and January are the wettest months (FAO, 2007).

According to Storrs (1995), vegetation in Zambia is generally classified into four major categories: The closed forests; open forests or woodland; termitaria; and grassland. Chidumayo and Marjokorpi (1997: cited in FOSA, 2001) further identified five forest types and five woodland types. The closed forests are identified as Parinari, Marquesia, Lake Basin, Cryptoseplum, Baikiaea, Itigi, Montana, Swamp and Riparian, while woodland types have been identified as Miombo, Kalahari, Mopane, Munga and Termitaria. In addition to the natural vegetation types, there are forest plantations of tropical pines and eucalyptus, covering an area of about 61,000 hectares (ZFAP, 1998; FOSA, 2001).

3.2 Population

As of 1 January 2018, the population of Zambia was estimated to be 17,470,471 people. This is an increase of 3.05 % (516,420 people) compared to population of 16,954,051 the year before. Zambia population density is 23.2 people per square kilometer (60.1/mi²) as of June 2018. Density of population is calculated as permanently settled population of Zambia divided by total area of the country, total area is the sum of land and water areas within international boundaries and coastlines of Zambia. The total area of Zambia is 752,610 km² (290,584 mi²) according to the United Nations Statistics Division.

According to CSO (2003), almost two thirds (65 percent) of Zambia's population live in rural areas. The proportion of rural population has steadily increased during the last three decades, from 60% in 1980 to 62% and 65 % in 1990 and 2000, respectively. This could be attributed to urban-rural migration trend, which is most significant in Copperbelt, Lusaka, Southern and Central provinces, which are the most urbanized provinces of the country, (UNESCO, 2017).

Zambia's population mostly (99.5%) constitutes persons of African origin and a smaller percent (0.5%) constitute other ethnic groups (CSO, 2003). The population dominated by African ethnic groups is made up of more than 70 Bantu-speaking ethnic groups including the Bemba, the single largest group (36% of the population), who live in the north-east and predominate in the Copperbelt, the Lozi of the west, and the Tonga of the south. Despite Zambia's ethnic diversity, it has been less affected by ethnic tensions than many other African states. This could in part be due to the policy of former first republican president, Dr Kenneth Kaunda of uniting the different ethnic groups in the country (Zambia", Microsoft Encarta, 2008).

3.3 Sites of survey

The site of survey includes sampled general national forest reserves areas protected and managed with JFM as community management programs, also include open forest as a forest with no management practice. It targeted different JFM pilot provinces such as Luapula and Central provinces and one open forest (Nyampande Open Forest) in Eastern Province.

Communities living around forest reserves were purposively selected for the survey. In total, six communities around six main forest were used in the study and they are located in five districts of three provinces and capture a social diverse and ecological heterogeneous landscape. The sites (forests) are presented in table 6

TABLE 6: Forest reserve areas of the study (PFAP, 2005)

Forest name	Location		Characteristics
	Prov- ince	District	
Mwewa	Luapula	Samfya	<ul style="list-style-type: none"> - About 2066 ha - Vernacular and exotic trees - Managed and exploited by local people and the Government
Lukangaba	Luapula	Mansa	<ul style="list-style-type: none"> -About 7163 ha -Managed by customary authorities
Myafi	Central	Mkushi	<ul style="list-style-type: none"> - About 2080 ha - Vernacular and exotic planted trees - Managed by the Government and customary authorities
Chibwe	Central	Kapiri-Mposhi	<ul style="list-style-type: none"> - About 48780 ha - Degraded - Highly exploited - Over 650 plant species - Managed by government and local people
Chaba	Central	Mkushi	<ul style="list-style-type: none"> - About 16550 ha - Habitat of more wildlife - Game ranching - Eco-tourism - Managed by Government
Nyampande	Eastern	Petauke	<ul style="list-style-type: none"> - Open forest - Production of wood and NWFP - Overexploited - Not well managed

I anticipated that local participation to vary across the landscape and forest communities. In addition, differences in social and physical infrastructure and proximity to urban markets determine to some extent the livelihood strategies pursued and specifically how and what forest products are harvested both own consumption and for sale.

The main livelihood system for the local people is subsistence agriculture. The main agricultural crops cultivated are maize, cassava, groundnuts, beans, sorghum and sweet potatoes. They also keep livestock, particularly cattle, goats, pigs, and chickens. These agricultural products are used for household consumption and for sale (Riché, 2007; FD, 2003).

Local people harvest wide range of forest products for subsistence use. Forest products such as firewood, timber, charcoal, Mungongo seeds and Mungongo oil, wild fruits, and mushroom are also sold to supplement household income. Mungongo (*Schionziophyton rautanennii*) seed oil production occurs in all communities around the forests. Local beer brewing is also a common trade as one of the incomes generating activities to supplement household income, (FD, 2003).

3.4 Data collection methods

To accomplish this study, Rapid Appraisal Methods of data collection (group interviews) and Highly Formal Methods of data collection (formal survey or individual interview) are used and supplemented by a questionnaire, (Babbie, 2004).

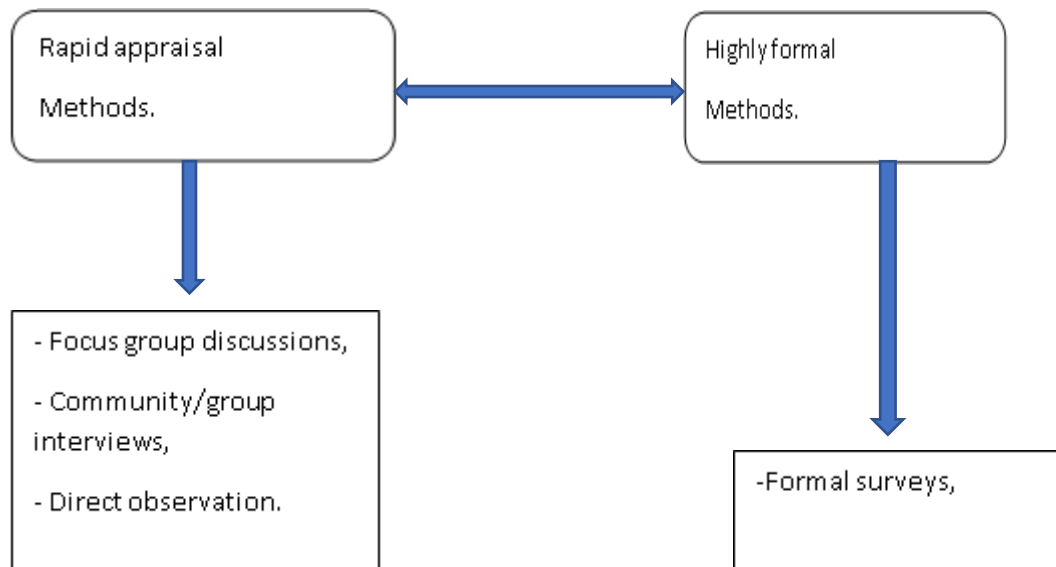


FIGURE 5: Data collection methods, (Babbie, 2004).

Data collection was carried out in two phases between April and June 2018.

The first phase involved the household survey using questionnaire with direct and indirect questions. The second phase was the focus group discussion with representative members of local community and forester officers during seminars and meetings. Questionnaire was in English and was translated in local language during the interview. Assistants for survey were engaged locally to assist in data collection and all were university students in internship. The selection was based on ability to communicate in local languages, familiarity with the area, and knowledge of participatory rural appraisal techniques.

The assistants were familiarized with the administration of the questionnaire before undertaking the survey. As supported by Bless and Higson-Smith (2000), and Babbie (2002), research assistants were oriented on the correct procedures and good ethics of data collection. Due to the heterogeneity and large size of the population of the sample area, a sample size of 80 households was considered adequate to represent the demographic distribution around forest reserves, consistent with Ndayambaje (2002).

A team consisting of two persons was used to administer the questionnaire. The questions were asked in vernacular languages predominant that are Lozi, Tonga and Nyanja depending on the area and the household and English were also used depending on the respondent. Questions were asked to the head of the household representing each selected household, in the absence of a household head, any older member of the household was allowed to lead in answering the questionnaire. The questionnaires were administered through reading of the questions to the respondent and marking the respondent's answer. The advantage of questionnaire filled by the interviewer is that the questionnaire can be administered to respondents who are unable to read and write. The approach helps also to overcome misunderstanding or misinterpretation of words or questions and ensure that the respondents understand the questions correctly (Stanley and Sedlack 1992; Babbie, 2002; and Babbie, 2004).

Direct administering of questionnaire by a researcher also ensures that all items on the questionnaire are considered and no question is omitted. Furthermore, the interviewer can ask the respondent for an explanation on certain unclear answers. The household survey generated primary data from the members of the local communities through their responses to the questionnaire. Men, women both old and young were involved in the interviews and supplied the answers although the questionnaire targeted the head of the household. The information collected included gender, age, and educational level of the respondent, household types, household size, means of livelihoods, and knowledge and awareness about forest management. The other information included access and user rights to the forest, ownership and management of the forest reserve, benefits derived from forests initiative and the perceived condition of the forest before and after the introduction of community forest management. At the end of the interview, participants were asked if they have something in mind to add, then after thanks were presented for showing amical participation (Babbie, 2004).

Participatory Rural Appraisal (PRA) provides a framework for data collection and analysis. PRA, as defined by Mukherjee (1993), is a methodology for interacting with rural communities, understanding them, and learning from them. It is also a method that allows free generation of information without undue demand.

During the study, the main objective of participatory research methods was to understand the perspective of the rural community expressed both qualitatively and quantitatively (Kumar, 2002; Mukherjee, 1993). This method was implemented by discussing with individual respondents regarding different questions of the questionnaire

All evaluations that involve participants or their records are subject to rules that govern the treatment of human subjects in research (Bless and Higson-Smith, 2000; Babbie, 2004). Therefore, prior consent was obtained from participants and relevant authorities before the study was undertaken. As a requirement for social surveys, the local participants were informed about the purpose of the study, type of data to be collected, and that their participation was voluntary. Safety of participants and confidentiality of the information collected about them was also guaranteed (Bless and Higson-Smith, 2000; Babbie, 2002; Babbie, 2004).

3.4.1 Focus group discussions and key informant interviews

The second phase was the discussion with Community representative members as focus groups. According to Stanley and Sedlack (1992), interviews are an effective way of obtaining information about perceptions of the programme. Bless and Higson-Smith (2000) and Babbie (2004) indicated that the focus groups consist of 4 to 8 persons, whilst PHAC (1996) pointed out that a focus group should compose of 10 to 12 people. The discussions were conducted in a semi-structured manner to enhance discussion among focus group participants, and to allow the researcher to ask systematically and simultaneously several people at the same time (Babbie, 2004). Ten discussion groups have been made composed of six persons each coming from different sites of research in order to get heterogenic information about perception, problems and solutions for forest management.

Participants were able to express, share, and analyse their experiences and knowledge. The method allowed participants to debate among themselves the issues brought before them to clear any differences in opinion and explore the disagreement in detail. The technique, according to Bless and Higson-Smith (2000), helped to triangulate the information generated; and the method also helped participants to learn from one another.

When using this approach there is no individual response as participants influence one other. The discussion helped to assess progress in forest management programmes implementation, impact of the programmes on the forest and on the community, and their sustainability.

Six key informants were identified during the survey interview, and they were forest officers and chief of communities. To obtain in-depth general view of the research problem, direct information and the exact view of respondents, the individual interviews were conducted with local community leaders and forest officers from Forest Department who are the implementers of the programme. Semi-structured interviews were conducted with open-ended questions regarding different factors influencing participation in forest management and the key informants included both men and women (Mukherjee, 1993; USDJ, 2006).

3.5 Data processing and analyses

The data collected through household interviews were checked for errors and verified (Frechtling, 2002). The data were then coded in an appropriate format for entry into the computer (Babbie, 2002). Primary quantitative data were subjected to statistical analysis by interpreting the questionnaire responses using computerised means of comparisons and descriptive statistics whereby Statistical Package for Social Sciences (SPSS) and Excel were used to analyze data to generate both descriptive and inferential statistics. Microsoft Word and Power Point were used to enter or present data.

✓ Multiple regression model

The multiple regression equation was used to analyse some factors influencing local people participation in forest management. The formula is shown:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \dots + \beta_i X_i + U_i \text{ (Dominick, 1971)}$$

Where: β_0 : Constant, β_i : Regression coefficient, x_i : Independent variables, U_i : Error terms.

The independent variables included in the model were age, status, education, and household size

✓ **Friedman test**

Friedman Test is non-parametric test (distribution-free) that is used to test the observation repeated on the same subjects, it is used to differences in treatments across multiple tests attempt. The procedure involves ranking rows together, then considering the value of ranks. Reliability and validity of results of this evaluation study depended on the correctness and truthfulness of information obtained from respondents and the perception of the interviews (Babbie, 2002). Existing secondary information (observation and existing information) was also used to increase reliability and validity of the data collected (Babbie, 2002; Kumar, 2002; USDJ, 2006).

The use of different methods to collect data helped to cross check correctness of data with different people using different methods and these methods complement each other through triangulation (Neumann, 1999; Kumar, 2002; Cunningham, 2001). All data are also reliable to other of development countries and can change at a certain time and research factors.

4 PRESENTATION AND INTERPRETATION OF RESULTS

4.1 Households characteristics and categorisation

Household demographic and socio-economic data collected during the survey include: Gender, age, education, and marital status. Afterward, categories of these data helped to analyse them in order to make comparison of characteristics.

A total number of 80 respondents were interviewed, from which 51 were male and 29 were female. The age of the respondents ranged from 18 to 70 years with an average mean of 42 years. Most of the respondents were between 31 and 40 years (almost 21% of all respondent), followed by persons between 41 and 50 years, (figure 6). Young respondent 18 to 20 years were few (only 3 respondents), while respondents between 51 and 60 years were 13, and respondent with over 60 years were 8.

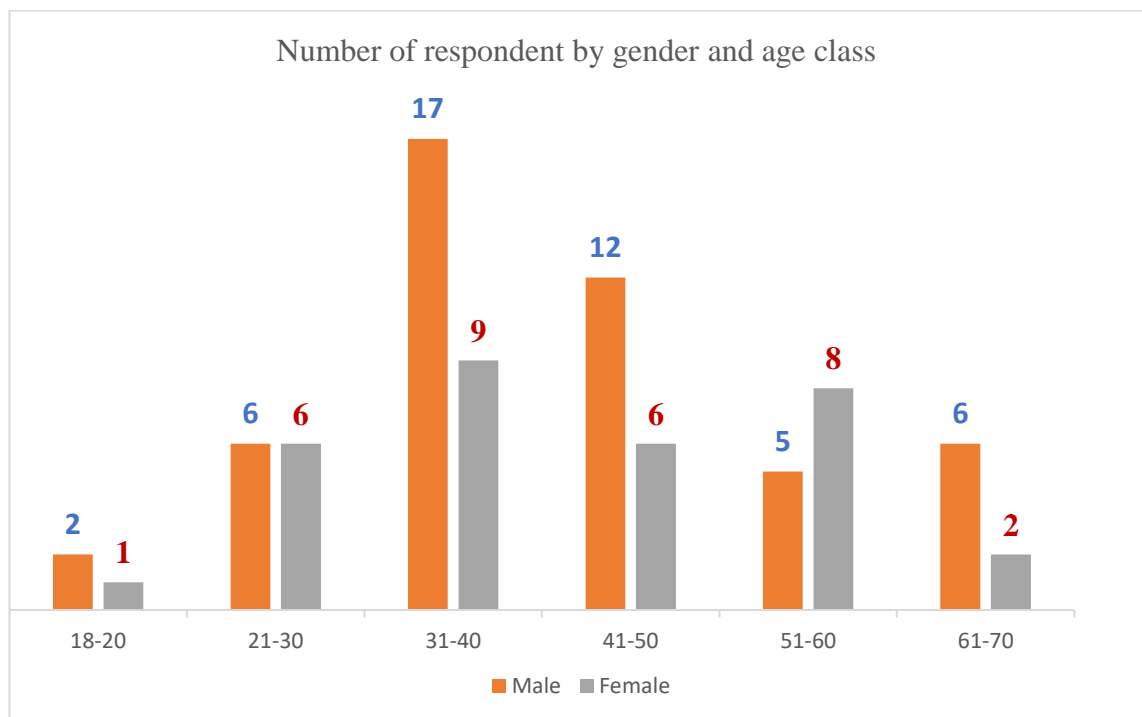


FIGURE 6: Gender of Respondents by Age Class (N=80)

There were more male (65.4%) respondents in the age groups 31-40 years as opposed to female respondents in the same age group. Conversely, there were more female respondents (8 respondents) in the age group 51-60 years compared to 5 respondents of males in the same age.

The marital status distribution shows that 47.9% are married, 28.1% still single where 13% and 11% are respectively divorced and widowed, (Figure 7). From respondents, 51% has a primary level of education, 30% has secondary level with 16% of uneducated people and only 3% have attended university but many of them did not finished, (Figure 8).

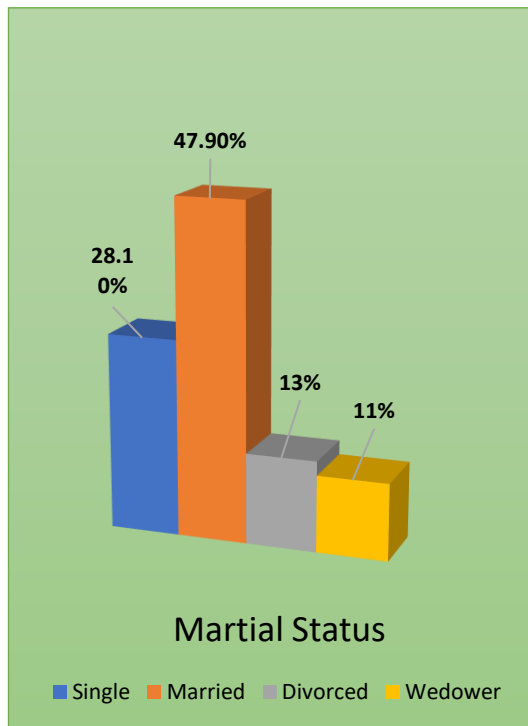


FIGURE 7: Marital status

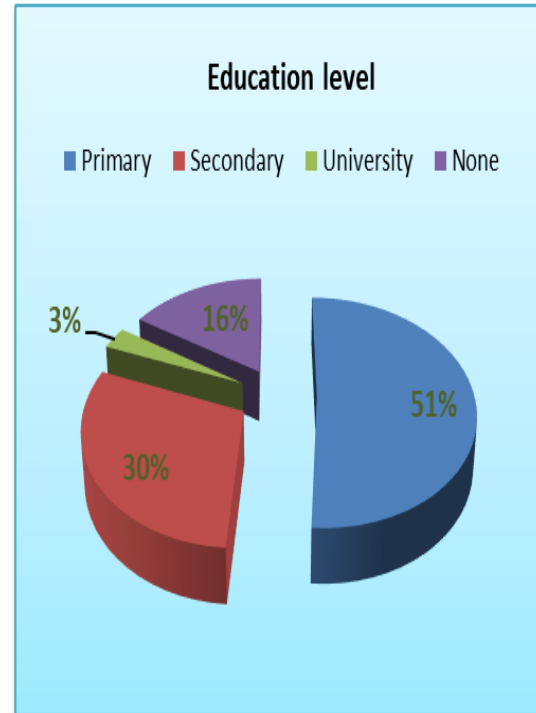


FIGURE 8: Education level

The evaluation of social positions of the respondents show that the interview reached 8 traditional leaders at the village level (10% of respondents), 68 respondents were ordinary community members equal to 85% of all respondent, and 4 respondents (5%) were government forest officials.

The minimum number of occupants per household was one and the maximum was nine. Most of the households interviewed had four to six occupants and the average number of occupants per household was four. Three household size categories were set up because of the wide range of the number of occupants per household interviewed. The three categories were: between 1 and 3 presenting 26% of total household, between 4 and 6 occupants equal to 51% of total households, and households with occupants between 7 and 9 present 23%.

4.2 Awareness and participation in forest management

The majority (68%) of the respondents were aware of collaborative management arrangement of forest reserve between government and the local community. However, 22% of the respondents indicated that the government through the Forestry Department still managing the forest reserves, 3% indicated that only communities managed the forest reserve, while the other 3% did not know who was responsible for managing the forest reserve, (Figure 10). There was statistically no significant difference of people awareness among regions.

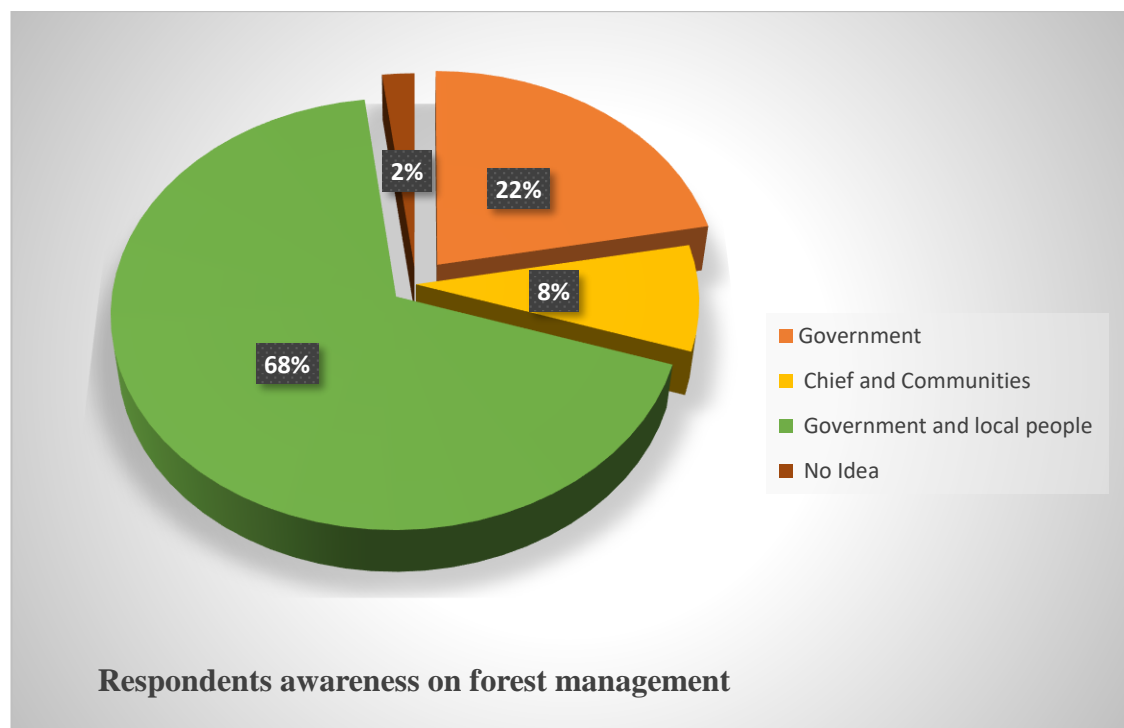


FIGURE 9: People Awareness on participatory forest management

The percentage of 72% of respondents participated in community forest management programmes. Comparing gender participation, there is mathematically a difference between female and male who participate in forest management activities.

When segregated by marital status, the results showed that fewer (31%) single respondents were involved in forest management program compared to the respondents who were married or had been married before (Figure 11).

However, there was statistically no significant difference between marital statuses and their participation in forest management ($p=0.08142$).

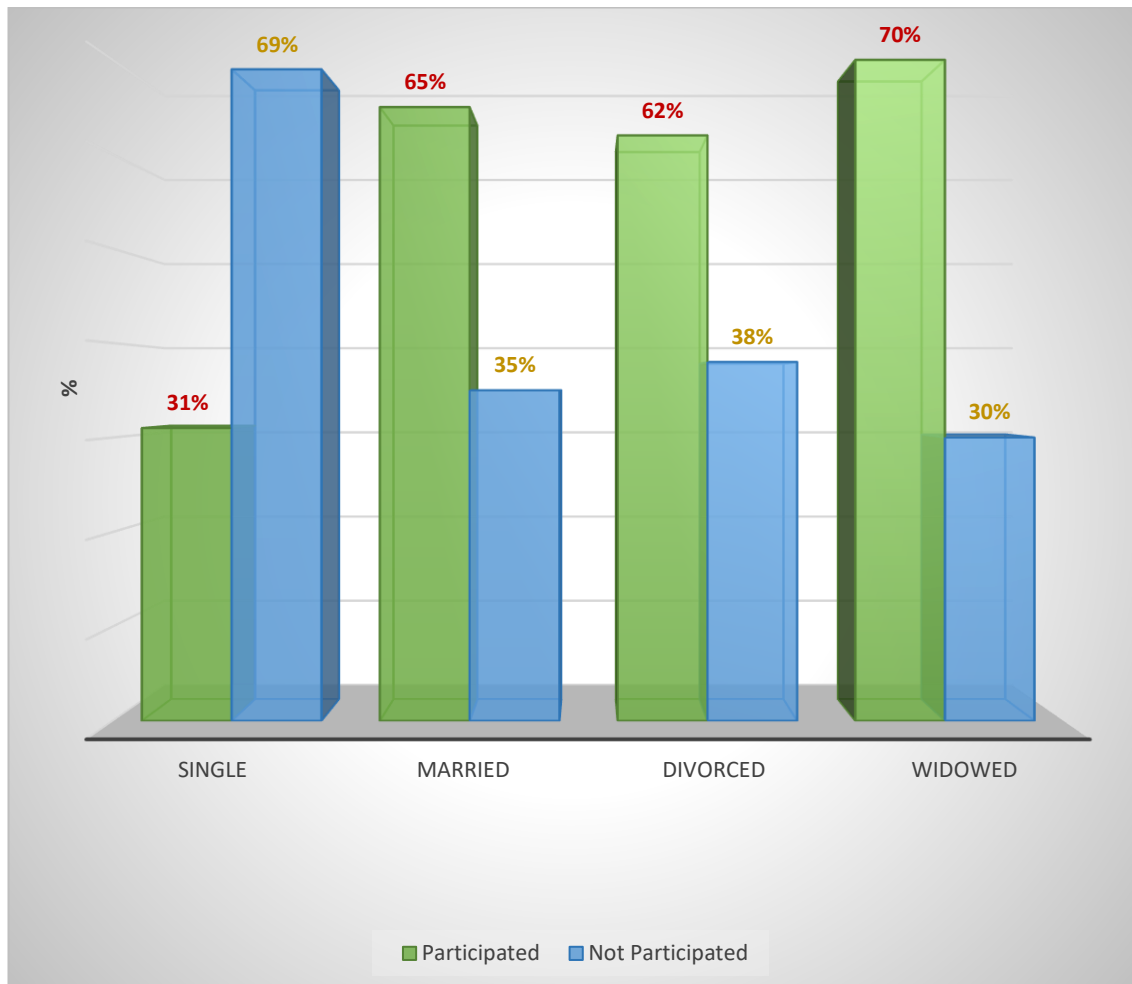


FIGURE 10: People's participation in forest management by marital status

Number of people living in the same household are taken into consideration to analyse the degree of local people participation in forest management. The results show a difference between the number of occupants in a household and their participation in forest management activities.

The households with 7 to 9 occupants were more involved in forest management programmes than others, (Figure 9). The results showed statistically a significant difference between the number of occupants in a household and the participation in forest management programmes

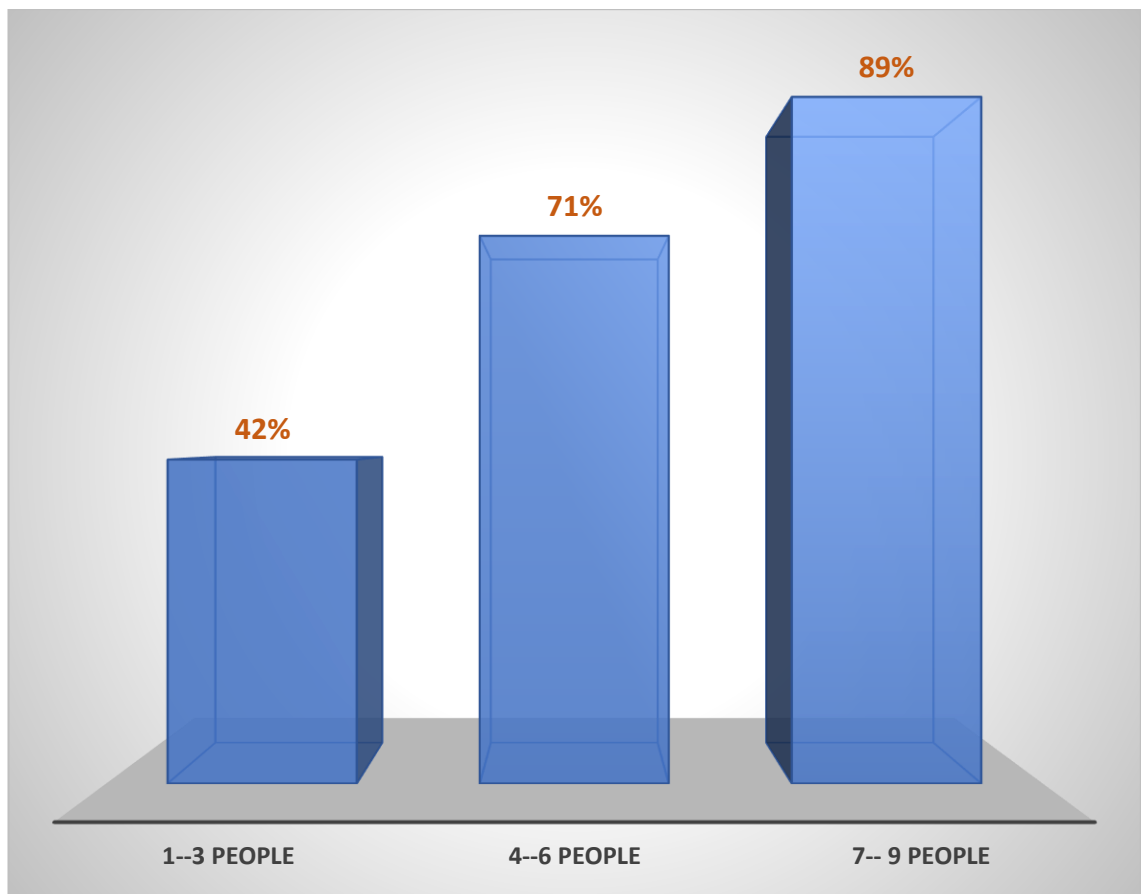


FIGURE 11: People participation in forest management programmes by Household Size (N=80)

4.3 Forests importance in study area

The respondents in group discussion were asked to give and rank different importance's of forests reserves, and the ranking scale was 1 to 5 (Where 1= Very highly important, 2= High important, 3=Moderately important, 4= Less important) due to local scale understanding. Direct benefits such as source of food, source of wood, source of medicines, source of building materials was cited. Also, indirect benefits such as recreation area, climate regulation, erosion control, habitat of natural resources and sites of research for institutions and students at national and international level have been recognised and are considered as environmental services in results presentation.

In general, the results revealed that within different regions around forest reserves people are moderately aware of importance of forests, (Table 7)

TABLE 7: Importance's of the forests in study area.

Importances	Forest reserves and their ranks					Average
	Mwewa	Lukan-gaba open forest	Myafi	Chibwe	Chaba	
Source of wood	4	5	4	3	4	4
Source of traditional medicines	3	4	3	4	2	3.2
Source of building materials	3	3	3	4	3	3.2
Source of foods	3	3	4	3	3	3.2
Environmental services	2	2	3	2	3	2.4
Total mean average	3	3.4	3.4	3.2	3	3.2

Environmental services are considered as the most highly important indirect benefits in all areas, source of traditional medicines, source of food and source of building materials are moderately considered as direct benefit of forests and local people consider source of wood as less important benefit from forests due to the prohibition of wood exploitation in these forests.

4.4 Different activities in forest reserves

Major activities operated in different forest reserves have been identified by using group discussion, all identified activities have been also compressed in general observed activities. They were separated on illegal and legal activities.

4.4.1 Illegal activities

The five illegal activities faced by forests according to the respondents' perceptions include poaching, tree cutting, water collection, fodder collection, and firewood collection. After the identification of illegal activities, they were ranked from 1 to 5 (Where 1= Very highly, 2= High 3=Moderately, 4= Lesly affected)

TABLE 8: Degree of illegal forest activities in Zambia according to respondents

Forest reserve areas	A	B	C	D	E	Mean Incidence
<i>Mwewa</i>	4	3	4	3	2	3.2
<i>Lukangaba open forest</i>	2	4	3	4	1	2.8
<i>Myafi</i>	4	2	3	3	2	2.8
<i>Chibwe</i>	2	3	3	4	3	3
<i>Chaba</i>	3	4	3	4	4	3.6
<i>Nyampande</i>	2	3	3	2	4	2.8
Mean incidence	2.8	3.2	3.2	3.3	2.7	3.0

A= Tree cutting, B= Poaching, C = Water collection, D = Fodder collection, E = Firewood collection.

According to the respondents, firewood and trees cutting are the most emphasised moderate illegal activities in forest reserves of Zambia. Otherwise, Nyampande, Myafi and Lukangaba forest reserves are more affected by illegal activities than others. Based on the interview, there is no big difference of level of illegal activities in different forest reserves.

4.4.2 Management activities

The study shows that respondents (71%) participated in forest management activities such as meetings, forest plantation, forest patrols, boundary maintenance, fire control and forest harvesting.



FIGURE 12: Different activities of communities in forests management

In general, more men were involved in forest management activities than women. However, both men (60%, 65%) and women (72%, 60) were more involved respectively in meetings and forest plantation than other activities, though the results showed that more women (68%) participated in boundary maintenance than men. And less women (11%, 9%) participated in forest patrol and forest harvesting. Compared to the sex mean average of participation in forest activities (men 55%, women 42%), there is no big difference for their participation, (Figure 12).

4.5 Benefits and benefits sharing

The respondents were asked what they benefited for participating in forest management activities, if they are satisfied for it or not and whom they consider as main beneficiary between them, government and NGOs operating in forest management. The survey results showed that more of the respondents have not received a tangible shared benefit from forest management programmes, (Figure 13).

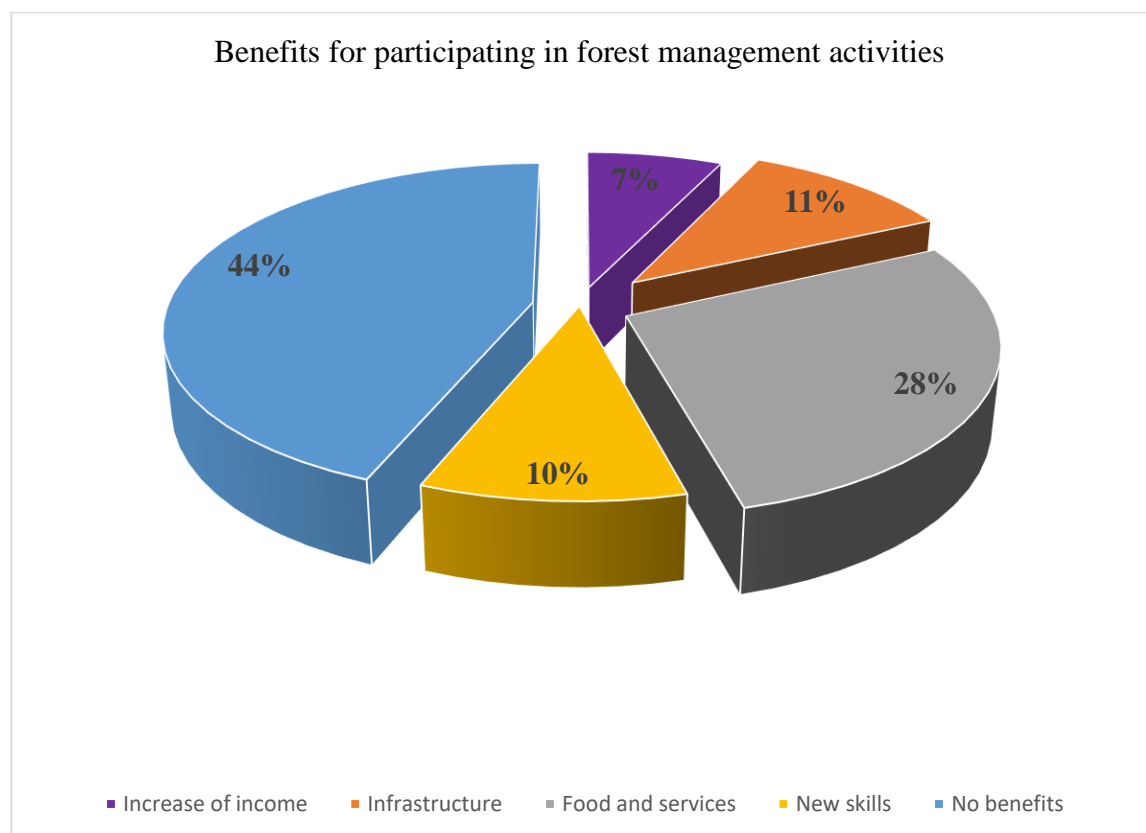


FIGURE 13: Importance of forest management program participation

The majority 44% of respondent reported having no benefit from forest management. 28% of local people recognise having food and services because of forest management, 7% of respondent increased their income, 10% gained new skills, 11% reported having constructed and renewed their houses and realised having community infrastructure development (schools, hospital) through acquisition of building materials.

The results on people benefit sharing satisfaction showed that more of respondents were dissatisfied regarding benefit sharing arrangement. Considering all stakeholders who participate in forest management programme, they benefit differently from forest reserves.

However, most of the respondents (68%) perceived the government to be the major beneficiary of the programmes, 20% of respondents consider NGOs as beneficiary while only 12% perceived local people to be the major beneficiaries, (Figure 14).

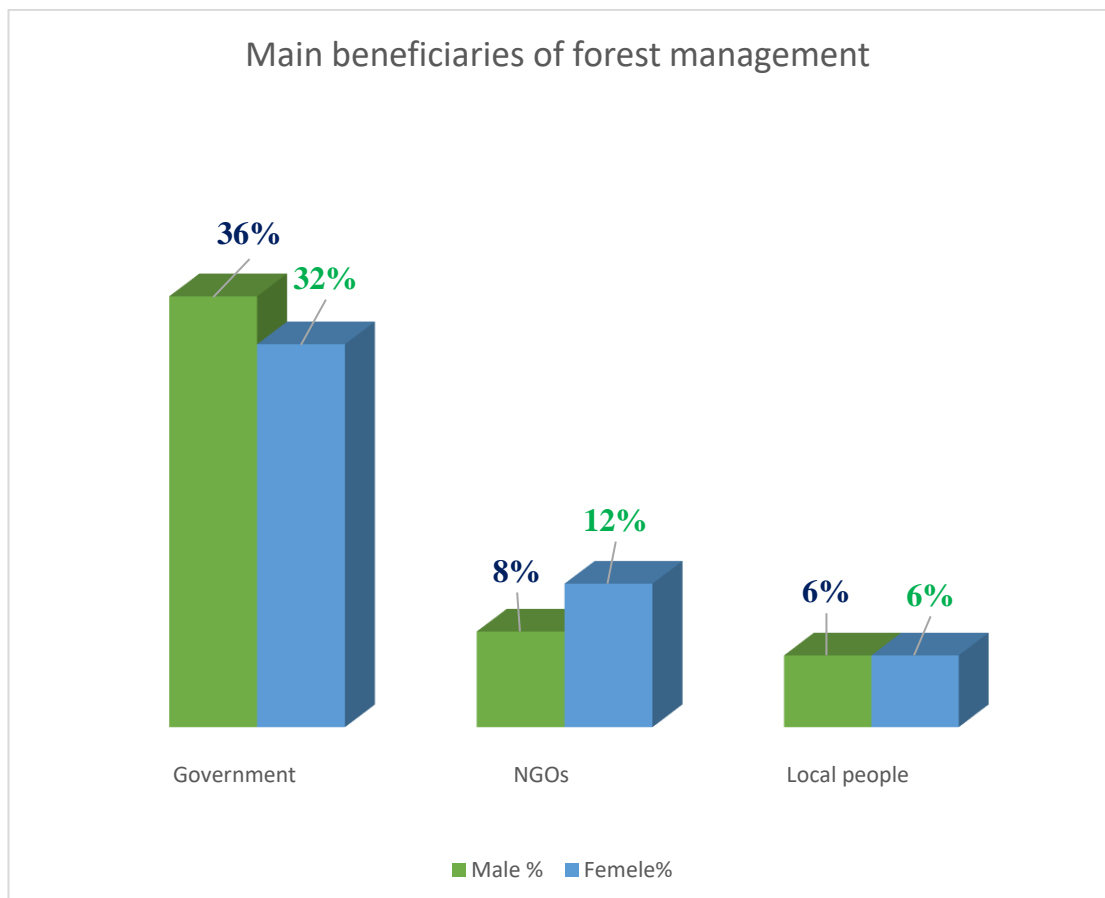


FIGURE 14: Beneficiaries and benefits sharing presentation

4.6 Participation and non-participation in forest management

Respondents were asked to name some reasons why some people refuse to participate in forest management activities. The reasons were vague (e.g: Having other job, Not knowing about the programme, No one asked them to participate, no time, being student, absence of benefits, these jobs are for men etc.), then, I (researcher) organised and classified them in different reliable factors.

Several factors reported to discourage people to participate in forest management are: Ignorance of local people is considered by 24% of respondents to be a reason that influence people not to participate in forest management programmes, poor coordination, insufficient benefit provision and lack of sensitisation respectively reported (46%), (52%), (56%) by respondents to be factors that discourage people to participate in forest management and 9% of respondent do not know why people refuse to participate in forest activities, However other activities (Agriculture, school, employment etc.) are considered by respondents (72%) as the main raison that influence the non-participation of local people in forests management activities (Figure 15).

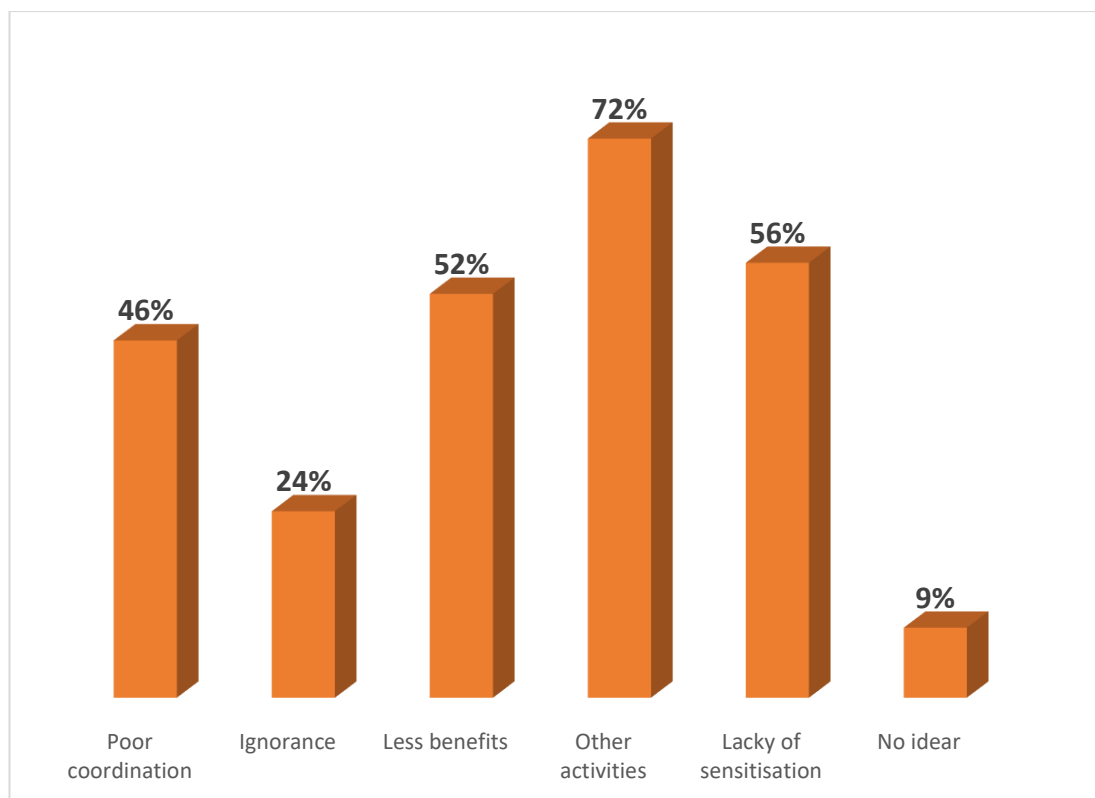


FIGURE 15: Factors that cause the no participation of community in CFM

Respondents were also asked for what can be done to encourage and increase the number of people who participate in forest management activities. Main solutions have been given, contrasted and ranked in groups of discussion by using percentage from 0 % to 100% according to their importance in four categories: Less important, Moderate, Important and very important (Table 9).

TABLE 9: Actions to influence community participation in forest management

Rank/ Perspectives (%)	People sensitisa- tion	In- crease Reve- nue Sharing	Micro-pro- jects instau- ration	Training and infor- mation Sharing	Low en- forcement
Less important	4	8	5	23	39
Moderate	8	10	58	62	17
Important	14	68	25	5	29
Very Import	74	14	12	10	15

The most very important solution to encourage people to participate in forest management is people sensitisation (74%), increase revenue sharing for the population (68%), training, and information sharing (62%) are also important solutions to encourage and increase people who participate in forests management activities.

Instauration of the micro projects (58%) which sustain people income is considered as moderate action to increase community participation. The increase of the law enforcement (39%) within communities is less important to make people accepting participation in forest management activities.

4.7 Forest as part of household income and subsistence

The households were asked to give main economic activities that sustain their income. They have been also asked to shortlist and give rank to main forest products that they get from forest. After that, they responded if they have markets for their products or not.

Determining the nature of economic activities done by the community was a central element of the study because they create the basis of rural people livelihoods. The study sought to understand also the extent to which forestry contributed to overall household economic welfare. Farming emerged as the predominant activity sustaining local people in the sector, with 81.2% of respondents indicated that they depend on agriculture. However, local trading (14.3%) activities which included buying and selling cloths, vegetables, fruits, carpentry, hand craft and small shop play also an important economic role in their life. Formal employment (4.5%) is represented by foresters, primary school teachers and accountants.

The analysis of forest products and their level of collection was facilitated by a 5-points Likert scale ranging from 1 very high forest product collected to 5 very low forest product collected, and according to this scale the lower the mean the higher the forest product collection attached by respondent. A non-parametric test (Friedman's Test) is used to rank the different main forest products.

The table below illustrates the extent of forest products collection in study area

TABLE 10: Level of forest products collection

	Mean Rank
Firewood	1.44
Timber	4.40
Food (Fruits, Honey, mushroom...)	3.04
Medicines	3.24
Materials (hand craft materials, poles, ...)	4.06
Charcoal	2.21

N: 80, Df: 2, Chi-Square: 172, Assmp.sg: 000

*Friedman Test of significance

The highly collected products are firewood and charcoal, foods and medicines are moderately collected from forests according to this analysis, timber, and other materials (poles, hand craft material, etc.) have a very low level of collection in different forests of the area. The analysis shows that there is a statically difference of collection level of products in study areas (Chi-squared value 172, $p=0.00$).

According to the respondents, a big quantity of forest products is consumed directly at household level, and other part is marketed in other to get money for other purpose. The figure 16 bellow shows different locations on which local people trade their forest products.

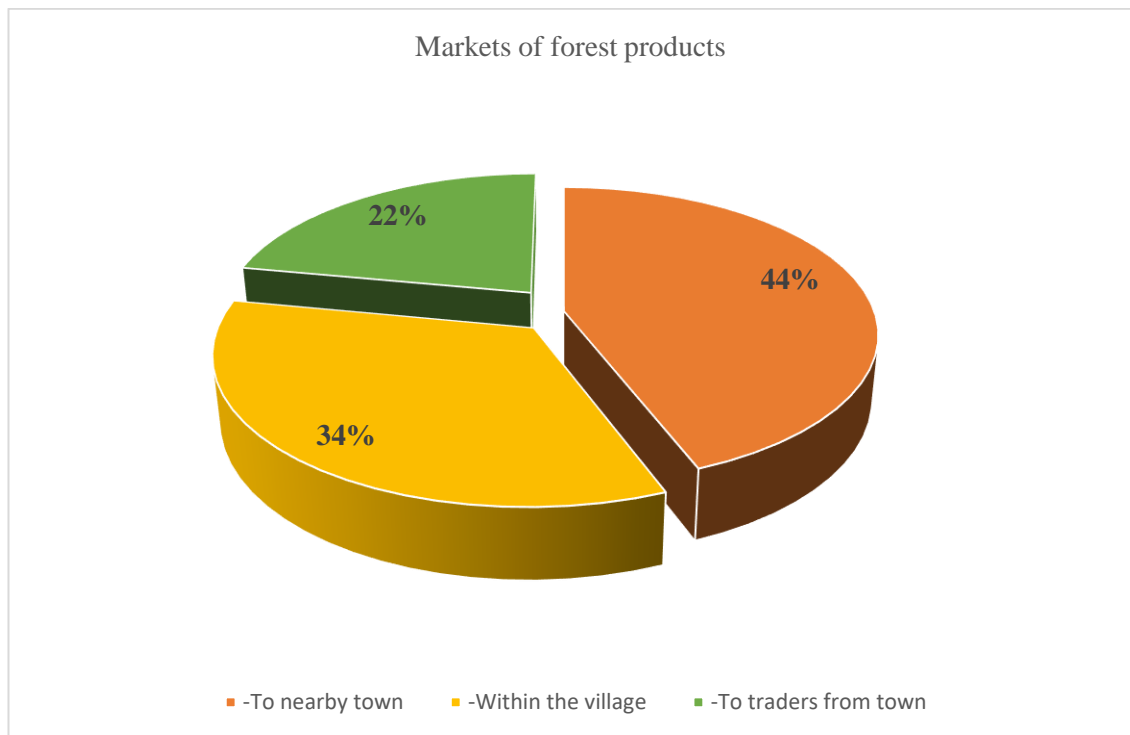


FIGURE 16: Markets areas of forest products

Most respondents (89%) confirmed having access to markets for selling and buying different products from forests. From that percentage, there are 44% of respondents who use nearby town markets, 34% have markets within their village, and also 22% of respondent sell and buy forest products from traders of another towns.

4.8 Community problems, cause and solution for forest management

To respond these questions, we used groups discussion and draw a SWOT analysis to facilitate the identification of main problems, their causes, and their solutions and after they were ranked by participants according to their importance's from 1 (very important) to 5 (less important), and the mean average of ranks from different groups were used to analyses factors.

TABLE 11: SWOT analysis of the factors that influence sustainable forests management.

Categories	General Factors	Mean ranks
Strengths	- Active population	1.8
	- Government sport	3.4
	- Clear Policy and lows	3.1
	- Available income	2.0
Weaknesses	-Corruption	1.2
	- Lacky of sensitisation	1.6
	- Ignorance	2.6
	- Lack of self-confidence	3.4
Opportunities	-Presence of stakeholders	2.0
	- Clear plan programs	2.4
	- Trainings	3.8
	- Schools	3.2
Treats	- Competition of other economic activities	1.2
	- Insufficient of land for agriculture	3.2
	-Poverty	1.6
	- Diseases	3.4
	- No access to credit	2.8

Strengths represent favorable factors influencing local people development. Respondents were aware of their activeness and that factor is considered as the most important to influence the development in the area and that have a positive impact on forest management.

Weaknesses in the above table represent negative factors influencing people in forest management. Corruption and insufficiency of sensitisation are the most important weaknesses that are founded in the area and these factors affect negatively the forest management program. There is also ignorance and lack of self-confidence within the population of the area, and all of them are considered as main problem causes of non- development of the country.

There are more opportunities in the region which are also considered as factors and solutions to sustain people in forest management. Presence of stakeholders and clear plan programs are considered as important opportunities that are also influencing local people to participate in forest management activities.

Treats are seen as main problems of people that affect forest management. Therefore, competition of other economic activities to forest management programs and poverty are the most important problems that affect local people. These all problems influence people participation in forest management and influence people to do illegal activities in forest.

4.9 Perception of key informants on CFM program success

Key informants were Forest Department members of staff in different districts of survey and leaders of different groups or cooperatives who participate in forests management activities. They were asked to demonstrate their overview for the forest management program success on forests and local people.

In general, 57% of the respondents perceived that the project was in general successful. Furthermore, 59% females and 62% males indicated that the influence of program on local people is not yet seen, particularly in improving the general livelihood conditions, but forest reserves are well improved due to the program.

Key informants gave their own perception on participatory forest management programme success to forest reserves and communities. By using percentage, the perception was different comparing 5 past years.

From 2015, community forest management program is being implemented in different forests of Zambia and forests are developing. Comparing years, 70% of respondent remarked that in 2017 forests were better managed and in 2016 local people were developing better due to their participation in forest management activities, (Figure 17).

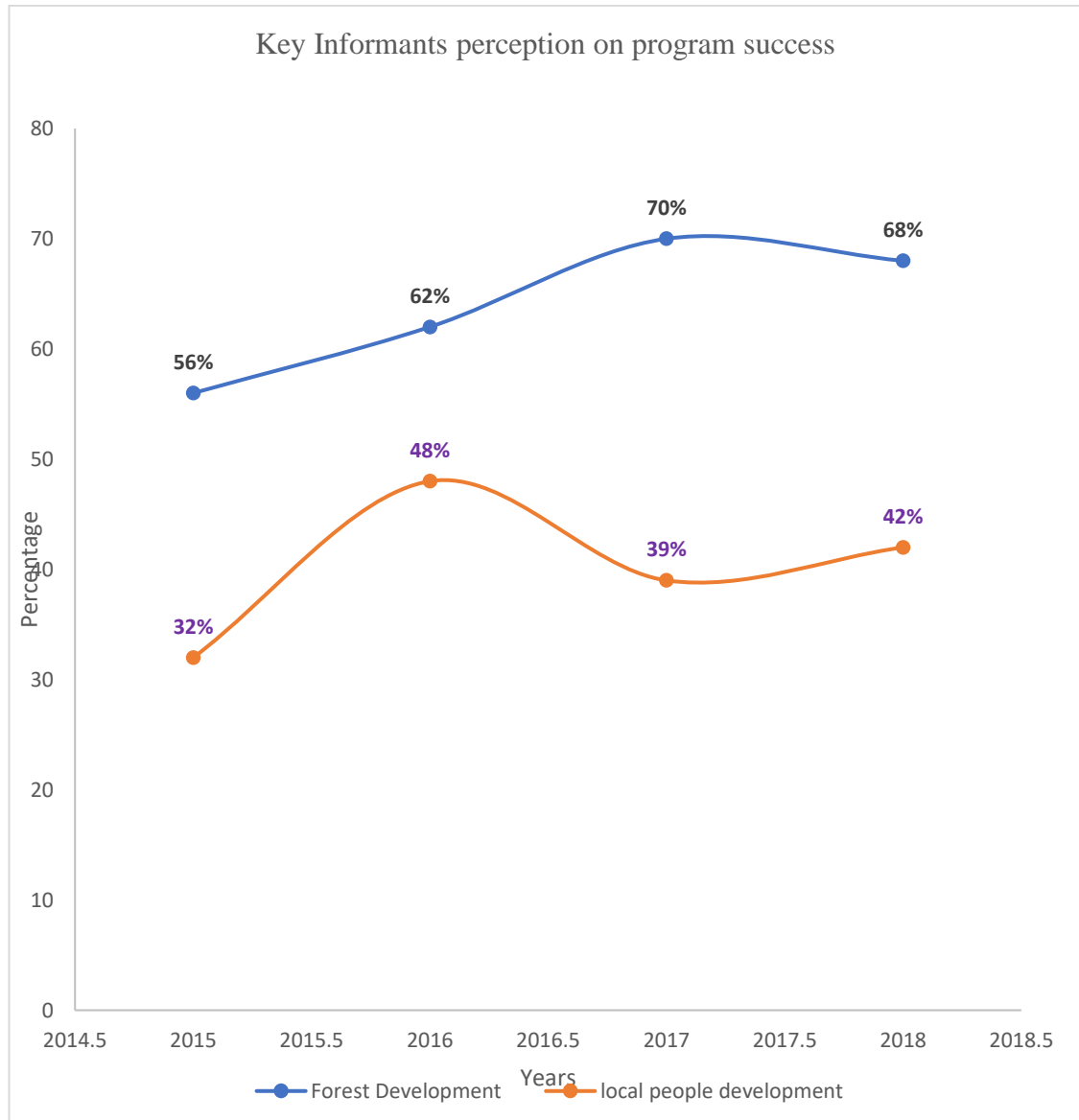


FIGURE 17: Key informants' perception on community forests management program success

5 DISCUSSIONS OF THE RESULTS

5.1 Local community activities and their involvement in forest management

The majority (81.20%) of the respondents depended on agriculture for their livelihoods, while a minority are dependent on local trading and formal employment. The implementation of community forest management program in the areas during past years, local people had high expectations of obtaining immediate benefits comparing to the previous management system where all the revenues from the forest reserve went to the State. Local people were expecting that there would be improvements in their living conditions arising from the community forest management arrangement.

In Zambia, the Forestry Policy was appropriate and supportive of JFM (GRZ, 1998; PFAP, 2005) but the revised Forests Act of 1999 which is supposed to support the forest management programs delays its contribution to hindering the implementation of legal framework supporting joint forest management in Zambia. These factors affect the forest management because of still ambiguity between forest managers and the community regarding the level of participation and the benefit sharing.

The main forest protection and management activities reported to be undertaken by the communities in different forest reserves in collaboration with the Forestry Department were: Meeting, boundaries maintenance, forest patrols, forest plantation, forest fire control and forest harvesting. Generally, there was a difference in activities participation such as forest patrols, forest harvesting, fire control compared to attending meetings, boundaries maintenance and forest plantation. Maskey *et al.* (2003: cited in Behera and Engel, 2006) reported similar findings in a study conducted in Nepal's community forest management, that is, the levels of participation in community forest management were based on socio-economic profile of individual participants and the benefits obtained from the forest. As such most local people lost enthusiasm in community forest management programs.

Furthermore, due to the physical nature of forestry work, men and persons above the age of 21 years are dominant in forest management activities. A larger number of women and older persons above the age of 60 years did not participate in these forestry activities that demand power. This shows that as people grow older they depend less on forests as their main source of income or livelihood. Younger persons below the age of 21 years had low participation because of other occupations such as schools and other economic activities that are much better rewarding than forest management programme.

More women attend meetings and boundaries clearance and maintenance despite their numerical disadvantage, but they were few in other physical forest activities. However, some of the participants during meetings are simply silent, while others are compelled to attend meetings to have access to benefits that may accrue to the community in future. It has also been observed that participation of women in community-based programme activities is low, letting men dominate the decision-making processes (Godbole, 2002). Behera and Engel (2006) made similar observations during their study on the levels of participation in India's Joint Forest Management programme that more attendance of meetings did not automatically guarantee an influence on decisions taken.

The study shows that local community have a good level of participation in forest management programs, where 71% of the respondents including both men and women participated in forest management activities, but men are dominant. People embrace new programmes or policy initiatives with a view to improve their livelihood. The study showed that both men and women around main forest reserves were hoping to ameliorate their livelihoods by accepting to be involved in forest management program.

The participation of the local people in the study area was largely driven by the high expectation of receiving monetary benefits. But as reported by Behera and Engel (2006), these intended beneficiaries evaluate benefits and opportunity costs as the programme or policy initiative unfolds, and then decide whether to continue with the participation or pull out.

In the study area, most of respondents (79%) indicated that they were not satisfied with economic benefits from forest management arrangements. Consequently, some of the local community members were discouraged from continuing to participate in forest management activities. This was evident from local people's low participation in practical and some community forest management activities such as forest harvesting, and forest patrols.

Participation is critical in developmental programmes (Coralie and White, 1994) and at all levels. Murali *et al.* (2003) were also of the view that inadequate participation can be a drawback to initiatives such as CFM. Lise (2000) acknowledged that forests are better managed if people's participation is secured. But often the concept of participation is misunderstood as attendance of meetings (Ravnborg and Westernmann, 2002), which is not supposed to be the case.

Furthermore, during the study, I realised that local people were organised into three social positions: Traditional leaders who are in general chief of village and are highly respected by local people. There were government leaders and employees who were particularly in charge of forest management action plan implementation, and ordinary community members seem as simple residents of the region.

Local people in all these positions participate differently in forest management programs but participations of traditional leaders in forest management and other political activities are highly recognised. Many authors have acknowledged the need for active involvement of traditional leaders in CBNRM (Carter and Gronow, 2005). Shackleton *et al.* (2002) acknowledged the role of traditional leaders as the one factor that was important, particularly in Africa. In case studies conducted in Lesotho, Malawi and South Africa, it was found that where traditional leadership was strong and legitimate, it had positive outcomes in promoting local people's priorities. However, there was statistically no significant difference between formal education background and the involvement in forest management programme on the sites of study ($p=0.068$).

The study also shows that local community members between the ages of 31 and 50 years were more involved in JFM programme than those below 31 years and those above 50 years of age. The results revealed that younger persons around main forest reserves were preoccupied with other livelihood activities such as education, formal employment, and trading, which were considered more beneficial than forest management activities.

Low participation levels of the youth could also be attributed to lack of awareness and less sensitisation on forest management. While low participation of older members of the community in forest management activities was attributed to their advanced age diseases, lack of force and they could not bear the workload.

5.1.1 Factors influencing people participation in FM activities

There are many factors that affect community participation. Other economic activities, less sensitisation and insufficient benefit from community forest management programme to the local people are major factors that reduce several local people to participate in forest protection and management activities. The study revealed also that age, gender, educational levels, household size, and marital status, some of these factors influenced both the local community members already involved and those not yet involved in forest management programme.

African rural society has greater respect for elderly members of the community (Behera and Engel, 2006). When elderly people get involved in programmes they often assumed leadership positions and would easily influence decisions. In such cases, young people often fail to challenge decisions made by elders due to the respect they have for elders. Younger people reduce their involvement or participation in the forest management programme because they will have little or no influence in decision-making. In addition, this group is rarely targeted for awareness and sensitisation, and consequently are less involved in planning and implementation of developmental programmes. Most development programmes concentrate more on older and mature members of communities than younger people. Therefore, making them to have less or no interest in the programmes.

More local people with primary education participate in forest management programs than those with no formal education and high education. Local people with formal education held key positions in the local forest management community. The more literate members of the community are more likely to influence decisions as they were expected to have better information on the programme and are also better able to speak in public compared to community members with low or no education.

Jumbe and Angelsen (2007) made similar observations in the community around Chimaliro Forest Reserve in Malawi that people with formal education held key positions in local forest community. Lise (2000) in the study conducted in India also found that when education level was significantly high among the local participating community, it stimulated participation.

They also motivate other community members to participate (Lise, 2000; Wabash *et al.* (2001: cited in Dolisca, *et al.*, 2006)), as they act as role models in the society and inspire others with lower or no formal education. But in cases where wage employment opportunities are available outside forests, people with higher education levels are less interested in forestry activities (Jumbe and Angelsen, 2007) where returns are low or non-existence.

Similarly, Thakadu (2005) reported that a community with low literacy level was expected to take more time to assimilate, adopt and adapt new policies and concepts. Conversely, literate members of the community often tend to be more vociferous than illiterate members in expressing their views and are also more influential in decision making. Behera and Engel (2006) also found that the more educated members of the community, the greater were the bargaining powers they possessed.

However, the culture of elitism ought to be controlled because the elite in leadership positions may want to accrue more benefits to themselves at the disadvantage of other members of the community.

Household size influence participation in forest management activities. The study shows that households with less members does not participate up to a certain level compared to households with more occupants. In rural communities, the top priority is food security.

Households with fewer occupants therefore will prioritise food security to forest management activities, while those with large numbers of occupants can afford to participate in forestry activities. Larger households were able to allocate labour and time among the occupants and participate in forest management activities to diverse their livelihoods strategies unlike the smaller households. Behera and Engel (2006) also found that smaller household sizes have difficulties to find time for development activities because of family responsibilities such as domestic or other tasks.

5.1.2 Local people forest management awareness

Local people are aware of the collaborative forest management concept that the forest reserves are supposed to be managed in collaboration with the local community and the government. The increased awareness is a good sign for the successful implementation of the program planned by the Forestry Department during the initial stages under the Provincial Forestry Action Programme (PFAP).

The Forestry Department personnel involved in implementing the programme also have good understanding of the forest management programs and concepts. They can discuss and interact with local communities and other stakeholders. The good relation created between local communities and the local Forestry Department personnel fostered trust, understanding and cooperation. The increase in knowledge and awareness therefore enhances community participation.

5.2 Importance of forest reserves

The forests reserves are not a major contributor to their household income compared to agriculture. Olson (2007) obtained similar results during the evaluation of agriculture and forest programmes in the Eastern province of Zambia where agriculture contributed more to household income than forest activities. The local people were therefore found to be more involved in agricultural activities than forest protection and management for their livelihoods.

When forest was regarded as of low value economically, socially, ecologically and culturally, it becomes less attractive for local people to participate in forest management for their sustenance compared to other main economic activities. Jumbe and Angelsen (2007) also found that high dependence on forest induces higher rates of participation, meaning that low dependence on forest inhibits higher rates of participation. This study, however, revealed that despite the low value of the forest, the local people accepted to participate in forest management programme to restore the forest reserve and derive more benefits.

Local people are aware of the indirect benefit of forests. Environmental services are considered as the most important indirect benefit from forest reserves in Zambia. There are also forest products that increase the local people income are highly considered. These are Timber, charcoal, traditional medicines, food, firewood, building materials etc.

In other hand the indirect benefits are recognized especially by officials, employees, and local educated people around forest reserves. These benefits are on view of recreation as a touristic area, climate regulation, erosion control, and habitat of natural resources.

In different Asian countries, also local communities accepted to be involved in forest protection and conservation as to regenerate these degraded forest areas and in turn receive benefits and other incentives (Damodaran and Angel, 2003; Odera 2004; Behera and Engel, 2006).

There are several communities located in the immediate vicinity of forest reserves. That made them to be in better placed to protect and manage the forest reserves than those who are not residents in the area. However, lack of tenure rights threatened them to a sustainability participation in forest management activities.

5.3 Forest reserves cost and benefits sharing in CFM program

Most people (68%) consider the government to be the major beneficiary of the forest reserves, and the results on people benefit sharing satisfaction showed that 79% were dissatisfied with the forest management benefit sharing arrangement.

The reported tangible benefits accruing to local communities in near forest reserves under community forest management program were mainly NTFP, while the intangible benefits were the acquisition of skills, development of infrastructure and increase of income.

The participating local people are also supposed to receive economic benefit from the participation. Furthermore, the forest legislation did not even stipulate benefit sharing mechanisms and ratios as in other sectors such as wildlife. Therefore, under the present arrangements, the local community members bear most of the cost of forest protection and management. (ZFD, 2015)

As for the wildlife sector in Zambia, local communities are involved in coo-management of wildlife resources in Game Management Areas (GMA) and receive a share of revenue arising from consumptive utilisation of wildlife in their respective areas for their participation. The agreed ratios from hunting fees are: the community 50% (Community Resource Board (CRBs) 45%, and the chief 5%), ZAWA 40% and the Central government receives 10%. Conversely, from concession fees the agreed ratios are: community 20% (CRBs 15% and chief 5%) and ZAWA 80%. The financial benefits received by the communities are used on community projects such as schools, health facilities, maintenance of roads and bridges, and empowering women through women clubs, among others (ZAWA, 2009).

The same arrangement is reported in Chimaliro forest in Malawi where the government received 70% and the local community 30% of the revenue generated from sale of the forest products. In addition, the local community harvested NTFPs such as dry firewood, thatch grass, reeds, bamboo, caterpillars, wild fruits and cattle forage from the forest, but harvesting of live trees for firewood or construction was prohibited (Carter and Gronow, 2005).

In most countries, it has been reported that communities have not received the expected economic benefits from CBNRM. Shackleton *et al.* (2002) reported that the share of economic benefits for the local people often reached the community after some undue delays under CAMPFIRE in Zimbabwe. Equally, in India it was reported that the Forestry Department often claimed more than a half of the income from timber even though the Forestry Department played little or no role in protecting the harvested trees. Chobe Enclave Trust in Botswana, however, was the exceptional case where communities are reported to have received around US\$200,000 per year from wildlife utilization and tourism, and the income trickled down to 45 households, which shared about US\$125,000 per annum.

Distribution of benefits between the state and local communities is a critical factor in CFM program successes (Jumbe and Angelsen, 2007). As observed by Bwalya (2004) and Behera and Engel (2006), local community would normally reject projects where opportunity costs of their participation are higher than the benefits. This is true with the local communities around forest reserves in Zambia who are discouraged from active participation due to lack of equitable sharing of economic benefits.

Participation of local community in forest management is considered as an investment from where they expect a reward (Coralie and White, 1994; Dolisca *et al.*, 2006; and Jumbe and Angelsen, 2007). The benefits accruing to the local community from their participation in forest management activities are therefore expected to be higher than opportunity costs in order to compensate for the costs of their involvement. According to Murali *et al.* (2003), benefit sharing was one of the strongest reasons for acceptance and success of joint forest management in India.

5.4 Problems and their solutions to forest reserves management

Deforestation and forest degradation are the concerns of most governments, resource managers, resource users and donor communities. Most important factors contributing to forest degradation and deforestation are human pressure, weak government institutions and poor implementation of policies. Cultivation practices, fires, and felling trees for timber, firewood and charcoal production are some of the main disturbances of *Miombo* woodland (Boaler, 1966; Chidumayo, 1993).

Local community value NTFPs from the forest reserves. Consequently, the local people around forest reserves are allowed to collect NTFPs, and almost all the respondents harvest non-timber forest products (NTFPs) from the forest reserve as a benefit of their involvement in forest management. However, harvesting of NTFPs was not regarded as a major benefit for their involvement in community forest management program.

However, more people act illegally and destroy forest by participating in excessive poaching, tree cutting, water collection, fodder collection, firewood collection.

Cruz (2002) affirms that clearing of original vegetation for agriculture expansion, timber harvesting, firewood collection, charcoal production, and expansion of human settlement due to rapid human population growth have a negative impact on natural vegetation under the *Miombo* woodland. The impact of these disturbances varies and is differentiated by the type, size, intensity, duration, and the vegetation type. In Malawi, subsistence collection of firewood by local people from *Miombo* woodlands is likely to have less impact on the woodland than harvesting of firewood on a commercial level (Cruz, 2002).

Local communities participated in forest protection and management activities in conjunction with the Forestry Department following the initiation of community forest management. For that, the involvement of local communities in forest protection activities assisted in reducing the occurrence of illegal activities in the forest reserve.

The improvement was attributed to the involvement of the local community in forest protection and management. The collaborative management and protection of the forest reserve resulted in reduced late wild fires, elimination of encroachment, and control of illegal and unsustainable harvesting of major forest products, which subsequently enhanced natural regeneration of the forest (Carter and Gronow, 2005).

5.5 Local Livelihood Socio-economic condition due to CFM program

More local people had the perception that there was no change in the socio-economic conditions of the local households after the introduction of community forest management program and think not having benefit from forest management. But there is a considerable of people who recognise some change on socio-economic household situation such as getting skills, development of infrastructure, acquisition of food and services and amelioration of their income.

People who claimed to have socio-economic condition improvement in their household following the introduction of CFM, it was mainly associated with their participation and they have access to project resources such as information, materials, allowances in case of meetings or trainings outside the community area, and other privileges. The improvement is also attributed to some households' involvement in profitable forest-based income generating activities or were engaged in illegal forestry activities such as charcoal and timber production.

5.6 Forest management program assessment

Past years ago, participatory forest management programme has been developed, forests are being protected and resources are regenerating at a considerable level, but households are not developing and benefiting considerably from the programme by their participation.

Programme evaluation, as stated by Bless and Higson-Smith (2000), assists to have objective information about the programme performance and how it can be improved. Frechtling (2002) also indicated that evaluation was essential in assessing whether goals are met. Furthermore, according to Bellamy *et al.* (2001), evaluation of a programme was essential in identifying changes and provides learning at all levels. There should be change over time after the introduction of an intervention to evaluate the performance (Babbie and Mouton, 2001).

The objectives of community forest management programme were to enhance the livelihoods local people near forest reserves and to improve the condition of the forest reserves (PFAP, 2005). These objectives were supposed to be achieved through capacity building for the Forestry Department in participatory forest management, strengthening of local community and local institutions, and creation of an enabling environment for participatory forest management.

Local people are not totally appreciating the performance of participatory forest management programme. The main reason for the discontent still lacky of full implementation of the Joint Forest Management plan due to lack of adequate legal provisions to support local people to collect and share the revenues derived from forest reserves.

More of the local people interviewed see the government through Forest Department as the main beneficiary of the community forest management program. The facts are based on that the Forestry Department had reduced forest management costs after the involvement of local people in forest protection and management and revenues are not clearly shared.

It has been acknowledged that the revenues sharing, sensitisation and the instauration of different micro projects to increase the income of local people are the main factors to be considered in other to increase the community participation and good perception in forest management.

6 CONCLUSIONS AND RECOMMENDATIONS

This chapter presents two parts: the first part presents concluding remarks drawn from the study and the second part gives recommendations based on the findings of the study. The findings in this study are specific to the forest reserves of study area, but regarding the coverage of the study, these findings are applicable to the general performance of the forest management in Zambia and other collaborative natural resources management initiatives in Zambia and elsewhere in developing countries.

6.1 Conclusions

As conclusion, Zambian forests losses have a direct impact on the livelihoods of rural communities, above all through the declining supplies of wood and non-wood forest products. Severe adverse effects also occur indirectly with respect to the water availability and soil fertility, especially on steeper gradients. In a vicious circle, this accelerates deforestation. The rapid rate of deforestation poses also a huge threat to biodiversity.

Important prerequisites for improving and ameliorating these situations have already been putted in place, such as legal measures for transferring user rights to local communities and national guidelines on participatory forest management (PFM) which is viewed as an appropriate strategy towards supporting sustainable forest management and rural livelihoods. It is essential to include local people in the relevant processes for the sustainable, long-term management of forests. At the same time, local communities need to learn sustainable ways of using the forests. Forest department and NGOs experts provide training to this end, and they work with the communities in and near the selected forest reserves, showing them how to organise themselves for PFM.

The results show that majority of local people depend on agriculture and a large number participate actively (71%) in forest management activities. Demographic characteristics, occupation of local people, benefits from forest influence community participation in management programme.

The community in study area associate benefits with economic gains, that is why they perceive good improvement of forest reserves due to their participation of forest management activities and very less improvement of their livelihoods. However, it is still necessary to build up the relevant capacities for implementing PFM, especially in terms of community development. The roles of forests in sustainable land management, production of WFP and NWFP and environmental conservation are largely overlooked, and the part local communities play in managing forests has received attention in Zambia.

6.2 Recommendations

Recommendations are made based on the study results and observations. They are regarding the government and all stakeholders in forests management in Zambia.

To the government and Forest Department:

Set clear registrations and policy to determine access rights, user rights and the ways of benefits sharing in forest management,

Develop more sources of energy for the population, that will reduce the illegal and excessive use of forest products,

Sustainable planning together with other economic and development sectors is essential, these will reduce the loss of natural resources and capitals,

Facilitate the participation of private sector in eco-tourism and other forest-based business activities in order to create employment for the local people to improve their livelihood.

Promote markets for essential forest products such as timber and plant oil from *Schinziophyton rautanenii* (Mungongo), and develop forest industry by increasing processing, packaging and marketing of available forest products.

However, measures should be taken to reduce conflicts of interest among different stakeholders.

The Forestry Department should improve and increase dissemination of information and sensitisation on participatory forestry management to the local community in the area and to other stakeholders. (Introduce natural resources management clubs in primary and secondary schools, use communication companies like MTN, Air Tell, ZamTel, to deliver messages on mobile phones about forest conservation)

Groups and cooperatives of community forests management should be consolidated, trained and supported to influence the full implementation of the program.

Promote technology in forests management to reduce manpower and time for a sustainable management.

To the NGOs and private sector:

Increase their involvement in forest management programme by supporting government and local community financially and technically as a social responsibility,

To local people:

Make good organisation in groups and cooperatives to facilitate the management and their participation,

Participate actively in forest management activities for increasing socio-economic benefits and improving their livelihoods by ensuring long-term forest conservation.

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APPENDIXES**Appendix 1: Survey Questionnaire****Date****Day****Month****Year****A. Household characteristic identification****1. Name of the stakeholder.....****2. Sex:**Males Females **3. Ages**≤ 21 years 21- 30 31- 40 41-50 >50 **4. Marital status**Single Married Divorced Widow **5. Level of education**- Primary level - Secondary level - Tertiary level - None **6. How many people live in your home?**

7. What position do you hold in the community?

- a. Ordinary community member
- b. Traditional leader
- c. Government forest officer or government leader

B. Household awareness in forest management**8. Who is responsible of the forest reserve management?**

- a. Government
- b. Chief and Communities
- c. Government and local people
- d. No Idea

9. Give and rank five major importance's of forest reserves in this area?**10. Give a rank (1 to 4) to illegal activities observed near and within forest reserve**

Where 1= Very highly, 2= High 3=Moderately, 4= Lesly affected

- a. Poaching
- a. Tree cutting
- c. Water collection
- d. Firewood collection
- e. Fodder collection

11. What activities, mechanisms or managerial practices do you often do to manage forests?

- a)
- b)
- c)
- d)
- e)

12. What have you benefited as a community member from your participation in forest management?

- a. Increase of income
- b. Infrastructure
- c. food and services
- d. New skills
- e. No benefits

13. Are you satisfied of benefit sharing from forest management between you, government and other NGOs operating in the same programmes?

14. Why some people refuse to participate in forest management activities?

-
-
-
-
-
-
-
-

15. What can be done to encourage people to participate more in forests management?

-
-
-
-
-

Economic activities sustaining the household income.

16. what other major economic activities that sustain your income?

17. a) What are main Forest products do you get from forest?

b) Please rank them according to the order of collection, where 1 is 'very highly collected and 5 is very lowly collected.

18. Are there markets for forest products? Yes No

If yes, where do you sell or buy forest products?

- To nearby town
- Within the village
- To traders from town

19. Are there any problems/constraints are you facing in your activities?

Please rank according to the order of importance, where 1 is 'very important and 5 "not important'.

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-
-

20. According to you, what should be the causes behind these constraints

Please rank according to the order of importance, where 1 is 'very important and 5 "not important'.

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-
-

21. What suggestions could be implemented to solve the mentioned constraints?

Please rank according to the order of importance, where 1 is 'very important and 5 "not important'.

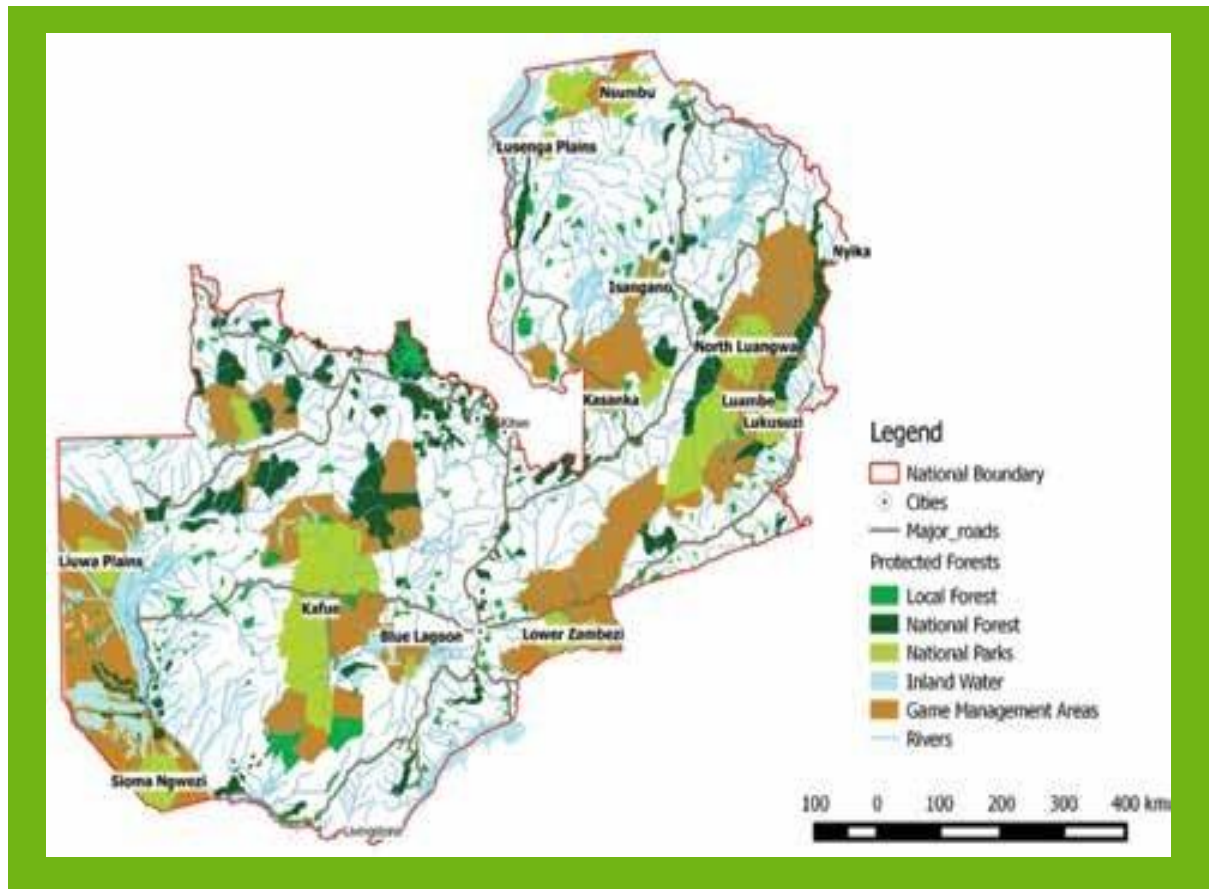
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22. In your opinion, is community forest management program successful?

If Yes: a) Give an overview percentage from 0% to 100% on program successful and on local people development due to the program for past four years.

Thank you for giving your time to answer these questions!!!

Appendix 2: Protected areas, and forest reserves in Zambia



Source: GRZ, 2016