

FOREST RESOURCES OF ZAMBIA: CHANGE OF SCENARIO WITH RISING POPULATION, SUGGESTIVE METHODS TO RETAIN SUSTAINABILITY

SUMATHI K SRIPATHI*

ABSTRACT

Sustainability is the main factor of all living forms. Sustainability of the resources of the macrocosm gives grandness to life and living. In this scenario of sustenance to fall back from the ancient past is the sustenance of the present, where a wide variety of innovative methods and techniques have been designed and formulated for the benefit of mankind. It's a large platform of innovative visions to cater to the needs of man and livelihood. A large improvement in sustainable development has been done to protect life on earth. At the foremost instance, if life and living in Zambia is taken for a consideration, it is to be noted that there are rapid changes to growth and development in the nation. With rampant increase in population, the civic sensibilities have changed and there is increased visionary thinking by the government as well as non-governmental organizations that work towards a goal of sustainable innovative development. The depletion of natural resources has paved way for the rise of this concept for the well being of human mankind. This paper outlines some major components of sustainability and harps on sustainable development along with the concepts of sustainable forest management on Zambian context to a larger extend.

KEY WORDS: Innovative, Formulated, Improvement, Rampant, Civic Sensibilities, Depletion.

ALL LIFE DEPENDS ON THE SUSTAINABLE TO REVEL IN SUSTAINABILITY IN ORDER TO SURVIVE

"The idea of sustainability is surprisingly simple: resource consumption cannot exceed resource production over time" says Donald W. Floyd (2002).

To implement the importance of sustainability, the Brundtli and Commission's (WCED 1987)

verdict can be taken as a prime concept for analysis: It states "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs." This statement gives an impetus to the study on forest management and conservation methods that can and should be followed to preserve the rich heritage of forests around the world and now taken to consider the forest reserves under the pretext of wildlife in Zambia.

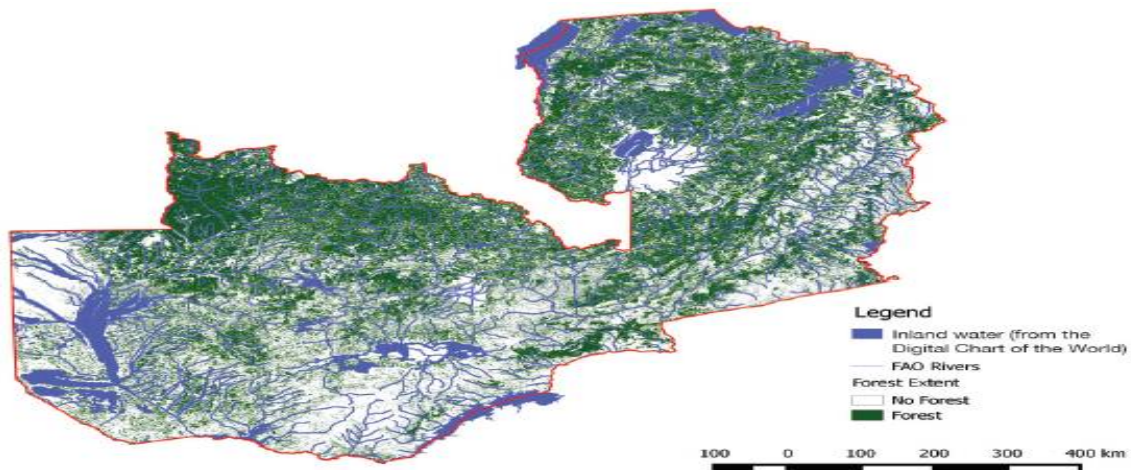
*Senior Lecturer, DMI,SEU, IVDL.

Correspondence E-mail Id: editor@eurekajournals.com

However, this ideology has complex entities as it is not properly understood by the general public to a larger extent and the realization of its importance with the concept of sustainable forest management needs a wide appeal. A large work force of forest management professionals are working even in this century as a continuum of the past years to design and formulate forest policies to protect and safe guard forests.

BASICS: WHAT IS THE IMPORTANCE OF FORESTS AND WILDLIFE?

Forest has been of great importance to mankind since prehistoric days. Sixty percent (60%) of the earth once covered with forest. With the development of civilization, large areas have been cleared to make way for farms, mines, towns and roads. Today about 30% of earth is still forested.



Zambian Forest Cover: source-map of forest cover by the Zambian Forest Department

The economic value of forests, supply many products like wood from trees as lumber, plywood and fuel wood or charcoal. Many varied products of daily life are procured from trees of the forests. Fruits, nuts and spices are gathered from the forest along with medicinal plants such as camphor, cinchona, and cocoa.

Forests help to conserve soil by preventing rapid runoff of water after heavy rain and minimizing flooding. Trees take in carbon dioxide and release oxygen into air, which is a great benefit to mankind. Forests influence local and global climate. Forests offer canopy to reduce light reflection, offer a sound barrier and help guide wind direction and speed. Forests also minimize noise pollution and are vital as a watershed. Because of the thick humus layer, loose soil, and soilretaining powers of the trees' long roots, forests are vitally important for preserving adequate water supplies.

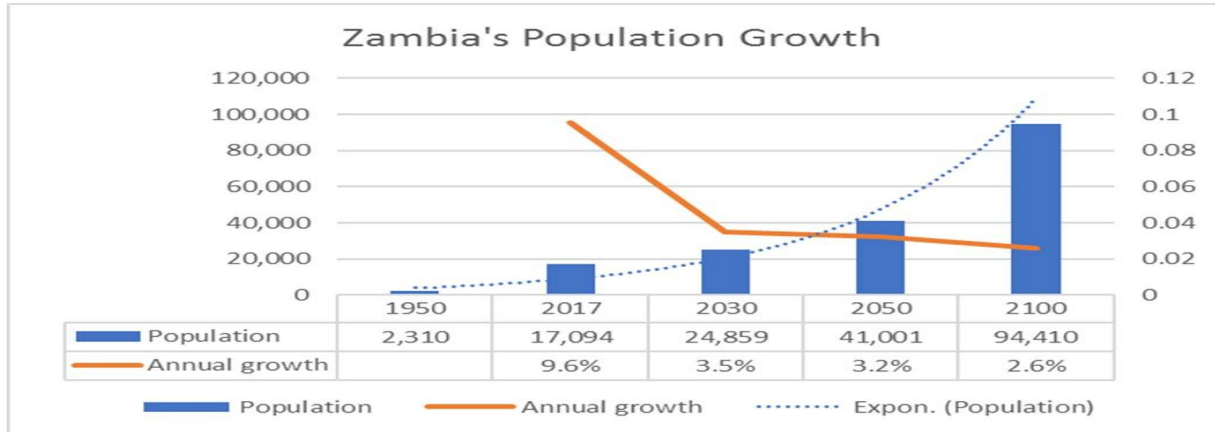
A REALIZATION ON THE MAJOR COMPONENTS OF SUSTAINABILITY

Sustainability implies the fact that the future generations will have an ecosystem that is made possible than the world that we enjoy today. Environment establishes stable ecosystems by providing increased productivity, enhancing species growth, in order to maintain an ecological integrity. This extends its impact on social and economical sustenance for human well being. The good, conserved establishments ensure that generations of all kinds in the future would benefit from the sustainable natural resources, which shall be the lifeline of living standards and economy.

The major issue of concern would be the environmental assets that bring in market and non-market values to maintain sustainability. Innovative modern systems should be created to serve as the backbone of sustainable

development. Human knowledge, the essential capital, for sustainable development, along with the natural wealth of natural resources that include water, forest and wildlife are the factors of modern innovations. It should be well

understood that we need to maintain the capital stock, the forest resources, and live upon the interests, the products that we get, thereby, balance equilibrium.



Source: UN World Population Prospects Report 2017

Evidentially, increase in population has a direct effect on the land resources in Zambia. Over years and a decade, the population has increased two-fold. This is creating a drastic imbalance to sustainability in terms of forests. A strain is felt on Zambia's natural resources. This is because trees of the dense forests offer many short-term opportunities to the society. This is the issue of concern as depletion of forests compared to the previous decades, would affect the amount of rainfall received, agricultural produce, water table levels under the earth's substratum, river flow and the fertility of the soil.

Substitutability is a major component of equilibrium of the forests in any part of the world. The natural resources, the component life forms of varied types, the concept of procreation to maintain a balanced ecosystem with interlinked food webs and chains have greater value on sustainable innovative development.

CONCERNS TO TAKE TO RELEVANCE IN DEVELOPING FOREST SECTORS IN ZAMBIA

The major elements of developmental concern

can be the awareness that is created to enhance forestry and sectarian resource development amongst the people throughout the nation. The possibilities that can be put forward as below:

Governance: Most social and economic activities should be coordinated to work on positive outcomes. It should be for the benefit of present and future generations of the country, where it is taken for concern. The people, both of the rural and urban settlements must be taught to handle forests with care and not to misuse the potentials. The leadership roles are destined to the regions on the borderline of the forest reserves to create bonds of safety and security to protect the resources.

Holistic approach: As citizens of a nation, everyone has a responsibility for a sustainable development. All governmental and non-governmental sectors should work in coordination for a common cause and take accountability of the liabilities faced with depletion or degeneration of natural resources of forest wealth. Possible partnership schemes are to be introduced to work in unison, thereby to maintain a balance of sustainable development and product development.

PLIABILITY AND FLEXIBILITY

This is a preventive indulgence to overcome crisis of instability of resources for the future. Milestone efforts should be taken to face the challenges of environmental, social, economical and cultural impacts basing on the policies and programs as initiated by the government, which should be taken to practice. Anticipation of crisis with increasing population is very essential and should be the guarding principle to safe guard forests and natural resources. Resilience should be imbibed to maintain best practices of forestry.

BIO-CONSERVATION

Biological and ecological balance should be planned to maintain forest ecosystem. Afforestation, reforestation and selective logging techniques can be adapted and societal influence can be inculcated in the minds of the people.

RESOURCE MANAGEMENT

This concern would reflect on putting forward the best use of non-renewable resources, reducing the production of waste with good waste management systems in relation to forest products. It is a must to endeavor ways to rehabilitate and reclaim damaged environs in the ecosystems where human mankind survive. This resource management brings in research, educational and technological advancements which should be enforced through forest sustainability. Ecological interdependence between provinces of the nations is programmed to establish prominence of forest landscape on reclaimed lands.

INTERDEPENDENCE OF LIFE WITH THE FORESTS IN ZAMBIA

Human living in Zambia is highly principled with the principles' of forest management and maintenance of good ecosystems to establish a layout for effective future implementations for the future generations. It should be analyzed that

the principles and objectives are harmonized holistically on ecological principles, silvicultural systems, practices, adaptive management approach inclusive of scientific knowledge available in the areas of concern.

EFFECTIVENESS OF FOREST MANAGEMENT AS OBSERVED IN ORGANIZED SYSTEMS IN ZAMBIA AS AGAINST THE INCREASING POPULATION DENSITY

Forest development is a calculative mechanism wherein, no species is left to become extinct and conservation of genetic diversity to overcome variance is emphasized. Primary Development Programmes and Supportive Development Programmes have been designed to maintain forest coverage in Zambia. Wood-Fuel Energy Development Sub-Programme has gained impetus in forest areas as large amount of woodlots of the indigenous forest belt of Zambia are burnt for charcoal consumption throughout the country. Avoidance of such a cultural practice from the ancient past still taken for usage needs a deeper thought for eradication and to reform the minds of people on using organic fuels as extracted from petro products.

Nevertheless, biotic and abiotic stresses should be minimized while biomass enhancement is optimized. For long term productivity of forests, edaphic and water quality and quantity is maintained. River systems through the forests to be channelized for best use and at the same time provide effective potable water for human and wildlife consumption. Water table maintenance in forest areas rejuvenates plant growth and forest canopy which should be monitored effectively.

MULTIPLE BENEFITS TO SOCIETY

Valuable resources development schemes are brought forward as forests serve as carbon pools for the future generations of a country. Non-

wood products development is introduced to supplement forest products, biological diversity forest reserves are created, forest asset creation is formulated to increase economically useful commercial products that can be marketed and a seed bank of indigenous plants is established by the forest department along with establishing natural parks and wildlife sanctuaries in all forested woodlots. This is a supportive advantage to Zambia as the possibility of enforcing such multiple benefits can be done at ease with the availability of resources in ample in the nation.

PRIORITIES OF A POSSIBLE FOREST ACTION PROGRAM FOR DEVELOPMENT IN ZAMBIA

Bringing the relevance to the study made by researchers of the government concerns in increasing the yield of crops as referred in the statistical table below with the influence of mature plant canopy of *Faidherbia albida*, a leguminous tree in the farms, commonly called as Musangu in Zambia. This study shows the outcome of good harvest without hampering the rich heritage of farmers and those farmers who are having degraded land or over used land areas.

Region	Maize yield (mt/ha)			Cotton Yield (mt/ha)			G/Nut Yield (mt/ha)			Soya Yield (mt/ha)		
	Under	Out	Sign	Under	Out	Sign	Under	Out	Sign	Under	Out	Sign
Central	4.85	2.07	*	.87	1.64	Ns	1.05	1.77	Ns	1.57	1.17	Ns
East	5.68	3.41	*	1.88	2.77	Ns	1.43	1.61	Ns	1.53	2.05	Ns
South	5.8	2.79	*	1.33	1.59	Ns	.61	.65	Ns	1.61	1.24	Ns
West	3.75	1.96	*	1.03	1.11	Ns	1.35	.93	Ns	1.18	.78	Ns
Totals	5.12	2.65	*	1.30	1.84	*	1.09	1.29	Ns	1.5	1.36	Ns

The leguminous tree, '*Faidherbia albida*' is an approachable access to re-forestation, as it can replenish the soils, increase maize yields, minimize dependency on fertilizers and thereby enhance small-scale agriculture in the country to become self-reliant to increase yield of the crop. Evidentially it has been analyzed as against the statistical interpretation being done, it can vouched that the maize plants within the surface area of the crop grows dense with rich crop production while the ones beyond the area has less yield coverage. The maize comparison trial under and outside the canopy of a fully grown '*Faidherbia albida*' is a remarkable study of forest development and practically applicable for deforestation and agricultural viability in the country of Zambia.

The growing of this tree through the nation would be a great innovation to agriculture output. Research on this leguminous tree has shown that there would be enhanced nitrogen fixation in the soil. The mature canopies of this

plant growth increase the presence of Nitrogen, Phosphorus, Calcium, magnesium, Potassium and Sulphur by the fall of its leaves and pods on the earth's surface. This organic mineral intake by the soil is a good source of natural manure which is replaceable to large quantities of artificial manure used. This innovative trend if properly adapted nation-wise on agricultural areas is sure to increase the yield twice-fold. In sustenance to the study made in 2009 by the ministry of agriculture in Zambia, it was found that the yield under the tree was more than five tones while outside the tree was less than half of the above yield reference at zero fertilizer condition.

Bringing to reference to another practical method for consideration and as focal concept of a latest innovation identified in practice in East Africa where communities around the continent's largest water body, Lake Victoria, regard the water hyacinth, *Eichornia*, as a great menace that clogs the lake and hampers their fishing activities. But in Lagos, Nigeria, some groups of

women have learned how to convert the invasive weed into a resource, providing them with the raw material needed to make handicrafts. So far, over 350 women, comprising mostly of widows but who also include students and teachers, from riparian rural communities have been trained on how to make finished products from water hyacinth, and they all sell them locally. This can also be taken for a thought by the people living around the low-lying regions of Zambia. (African Times.)

With a proud feel, it can be said that 'honey' from Zambia is the best in the world. It is a rich heritage from the ancient past. Naturalistic analysis on this concept is sure to bring in good dividends to forestry for bee-keeping can be replicated around the forests with effective biophysical conditions to make the areas sustainable. The forest-dependent communities can benefit from such an activity which is sure to improve their livelihood and socio-economic welfare. It is a potent biological fact that bees tend to increase pollination in the forest ecosystem that helps to increase the plant diversity, further preventing deforestation and degradation of forests by the increasing population

Forests, no doubt, serve as rich heritage of the past, present and future and are a natural identity for the nation. Health of all life on earth depends on healthy forest ecosystems. The beauty and landscape of forests add inherent charm to the natural resources available providing mental balance and physical elevation of mind and thought to the people of Zambia. Citizens of the nation should wisely participate in upholding the tradition of conserving forest ecosystems with proper usage of forest products for economic stability. All means of protecting the forest wealth is imbibed in educational systems in order to pass the rich heritage to the future generations. As forests serve as effective tourist's spots and recreation centers, it is an accepted fact of the government to bring forth

advanced training providing skills and knowledge to the forest officials posted in the areas of rich forests which directly provides employment to large number of people of different communities living in the periphery of the forest belt.

SUMMARY AND CONCLUSION

Zambia has a rich heritage of forest vegetation from the ancient past with lingering reminiscences even to this day. The people of Zambia and the government of Zambia work in maintaining the woodlots in wild regions of less population yet the peripheries are getting to be destroyed by the growing population. The reality poses the risk as the population has increased two-fold from the previous decade. The population of 9.3 million in 2000 has risen up to 17 million in the recent years. This upheaval of population is a factor to monitor with rising disintegration of forests for economic development of the nation. People participation for sustainability of forests is a welcome feature of the future, leading to compliance to the reality would strengthen the bond of man with nature.

REFERENCES

- [1]. Aagaard, Peter. 2010b. Conservation Farming, Productivity and Climate Change. Conservation Farming Unit Zambia, January 2010. 9 pp.
- [2]. Bigsten, A. and S. Tengstam. 2008. Prospects for Poverty Reduction in Zambia: Country Economic Report: 4. Sida.
- [3]. Butterfield, R. and C. Kosnik. 2010. Sustainable Landscapes Assessment: Zambia. USAID/EGAT/NRM. 19 Dec 2010.
- [4]. Bouman, O.T., and Brand, D.G. (Editors). 1997. Sustainable forests: global challenges and local solutions. Food Products Press. Binghamton, New York.
- [5]. Castro, A.P., Hall, E.R., and Adamowicz, W.L. 1999. Life cycle assessment for sustainable forest management. Working

- Paper 1999-23. Sustainable Forest Management Network. Edmonton, Alberta.
- [6]. Chidumayo, E. N. (1996a). Handbook on Miombo Ecology and Management. Stockholm Environmental Institute, Stockholm.
- [7]. FAO, 2001, Global Forest Resources Assessment 2000. Main Report. FAO Forestry Paper 140. FAO, Rome.
- [8]. Gumbo, D.J., Moombe, K.B., Kandulu, M.M., Kabwe, G., Ojanen, M., Ndhlovu, E. & Sunderland, T.C.H. 2013. Dynamics of the charcoal and indigenous timber trade in Zambia. A scoping study in Eastern, Northern and Northwestern provinces.
- [9]. Mickels-Kokwe, G. 2005. The economy of forest-dependent households in Zambia. Forest Income in Rural Households.
- [10]. Nkomeshya, A. 1998b. The role of forests in the livelihood of selected households in Central, Copperbelt and Luapula Provinces Zambia. PFAP Publication No. 48 Forest Department, Ministry of Environment and Natural Resources, Government of the Republic of Zambia, Lusaka.
- [11]. World Bank (2008): *Practical Guidance for Sustaining Forests in Development Cooperation: Guidance for Sustaining Forests in Development Cooperation*, Washington.