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Sustainable Utilization of Forest Resources: A Step to Sustainable Agriculture

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Author's contribution

This work was carried by EU who managed the literature searches as well as drafted the manuscript.

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ABSTRACT

Aims: This paper discusses some interventions that could lead to wise use of forest resources as a step towards sustainable agriculture. Forest resources provide various materials that meet the basic human needs such as food and health-care. However, the use of these resources and the manners of their removal from the forest has been a serious problem when considering sustainability in agriculture. Over-exploitation hampered sustainability and efficient utilization of forest resources would lead to sustainable resource use in forest management and agricultural production. The result would lead to constant supply of needed resources.
Conclusion: Forest resources therefore must be conserved and utilized wisely in order to attain sustainability in agriculture.

Keywords: Forest resources; sustainability; agriculture; utilization; renewability; non-timber forest products.

1. INTRODUCTION

The genesis of early man's history began with the use of forest resources for his sustenance before the advent of production agriculture. At that period the world population was small and resource users were few and there was dearth of knowledge about the various uses of forest

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resources. The rise in human population and evolving knowledge about uses of forest resources through scientific research exerted a very high pressure on the forest and other resources. This eventually led to over-exploitation of the forest resources on which man originally depended on. That situation continued such that even in the advent of food production, agriculture was no longer sustainable. Since forest resources could provide man with needed food, if the forest is managed for sustainability then its resources would be complimentary to agricultural production thereby ensuring sustained food supply.

Forest resources refers to all products from the forest and its values could be quantified in relation to their benefits to man. The benefits include timber and non-timber products such as wildlife, watershed, fruits, nuts, ropes, leaves, barks, rattan, seeds, wax, gums, resins, honey, edible vegetables, herbs, mushrooms, roots, fuelwood and fibre. Non-wood components of forest resources, the shrubs and herbs form significant portions of food supply for both human and wildlife populations. Seed, pulp, wood and leaves of some trees such as *Irvingia gabonenesis* and *Parkia biglobosa* are widely used in Nigeria for food, medicine and as inputs in rural industries. Forest resources provide various materials that meet basic human needs such as food, fuel, fiber, shelter and medicine. The abundant forest resources in Nigeria if properly utilized could enhance and compliment agricultural production, thereby making agriculture sustainable. This paper examine some of the interventions that could result into sustainable utilization of forest resources which if adopted would serve as an addition to agriculture produce, thereby ensuring food availability, otherwise, sustainable agriculture.

1.1 Forest Resources Utilization and Over Exploitation

Forest resource use involves the extraction of such resources (such as grazing for livestock), cultivation of crops and cutting of trees, [1] hunting of wildlife and harvesting and collection of non-timber products. The problem of over exploitation of forest resources arose from the wrong concept that forest resources are naturally renewable and therefore the amount, or quantity as well as the methods of removal or harvest is inconsequential in renewability. [2] stated that Nigeria has a total forest area of 14,387,000 hectares in 1990. Five years thereafter, the Nigerian forest estate stands at 13,780,000 hectares with an annual change of 0.9% which according to [3] is deplorable. Proper utilization of forest resources have not been put in place. Most times, resources are over-exploited beyond the required need, either as food or as a health-care. The left-overs cannot be returned to the forest or to the plant from which the part was taken. This leads to loss in resources due to uncontrolled harvest. The Proper utilization of these resources will ensure that resources are not over-exploited and wasted and are readily available and since forest resources could also serve as food and other needs, they play complimentary roles in agriculture in as much as they provide food in conjunction with agricultural production. Proper utilization of forest resources could therefore ensure sustainability in agriculture. Reserve depletion due to over exploitation would not arise when resources are sustainably utilized and man's dependency would be two-fold (forest resources and agriculture produce), thereby sustaining agriculture.

A major concept of forest resources utilization is the conservation of the resources, which is the method of using the resources wisely. Conservation of forest resources would lead to sustained agriculture in that resources would be properly managed, protected, harvested at levels that do not exceed re-growth and products efficiently utilized. Resources are not conserved but are rather exploited and wasted. Forest resources are harvested at alarming rates without cognizance of the resources' ability to replace themselves. The harvested products are wasted through inefficient utilization. For example the amount of wood waste in form of abandoned logs, rejected wood, off-cuts and slabs of wood at wood companies, logging sites and wood mills reveals that wood are not efficiently utilized after harvest [4]. Sustained agriculture among other things implies food availability or supply while the environment, in this case the soil, remains healthy. However, food availability and supply does not come from agriculture production alone but also from the forest. The harvest and use of forest resources must on this wise be brought under control to ensure wise use and in continuity. The inability to control sustainable harvesting of forest resources is responsible for the unwise or non-judicious utilization of these resources which constitute obstacle to sustained agriculture, because the resources from the forest that could have complimented agriculture production to make it

sustainable, is wasted and at a faster rate. When that happens, there is insufficiency in food supply.

1.2 Forest Rsources Utilization and Resources Conservation for Sustainability

The term 'forest conservation' could have a very wide meaning and interpretations from intensive timber production to total preservation. Conservation on the other hand is the planning and management of resources so as to ensure their wide use and continuity of supply while maintaining and possibly enhancing their quality, value and diversity [5]. [6] stated that conservation is an attempt to balance two moral demands: The demand for development, including economic growth, which arises as a result of the needs of the present generation, especially the low income groups to improve their quality of life. The other demand is for sustainability; for ensuring that we do not sacrifice the future for the sake of present gains.

As stated by [7] the new challenges faced globally now in sustainable forest resources management include:

- The reduction of deforestation and forest degradation through effective conservation measures and sustainable utilization of existing forest resources, as well as alleviating the pressure on the forest by addressing the cause of over-exploitation.
- The revitalization of forest based industries and enterprises to enhance the valorization of forests through optimizing of forest goods and services.
- The increase of the forest resource base through tree planting, afforestation and reforestation and
- The strengthening of national capacities for effective implementation.

The foremost emphasis is on reduction of consumption of wood products, protection of forests and management based on a new relationship with the forest, which is relationship based on respect and humanity, that is first, love the forest, the second is that you protect all parts of the forest while using the forest wisely, third is to trade or barter the excess bounty of the forest [8]. The main question is whether we need to conserve the forests and to that, what degree of utilization do we need to embrace or whether we need to utilize the forests and to do this in a sustainable manner, what degree of conservation must we ensure.

1.3 Forest Resources and Sustainable Agriculture

Sustainability could have different meaning to different people because it is not a fixed-steady state situation, but rather changes with societies' socio-economic needs, which varies over space and time. Sustainability refers to the ability of an ecosystem to maintain ecological processes and functions, biological diversity and productivity over time [8,9]. Agriculture could be said to be sustainable economically, when the supply of agriculture products matches the demand for them and reasonable income is generated; ecologically sustainable when agricultural practices are environmentally sound and would enhanced rather than degrade the land and is culturally sustainable when the standard of living of farmers, families, communities and fabric of the rural life remain viable [10].

The rapid increase in the world population leads to increase demands for food production. Unfortunately, there is presently the militating factor of climate change which affects agriculture adversely. Agricultural produce in the ace these phenomena would not be able to match with demands for food. The surest way this could happen is by turning around to forest resources, realize their importance, conserve them and develop a plan for sustainable and wise use or utilization. With that put in place, the resources from the forest and produce from agricultural production would surely keep the supply in matching with demand thereby resulting to sustainable agriculture.

Most rural livelihood depends on utilization of forest resources. The only way to ensure sustainability in agriculture would be deliberate efforts towards conserving these resources such that their rate of renewal could be expedited and life continuity assured. Good method or techniques of harvesting forest resources should be developed so that over exploitation which usually leads to resource depletion could be arrested. If the service roles of these resources are recognized, protected and used wisely, the standard of living of the people would be viable, which defines sustainable agriculture. [11] reported that many communities in Nigeria live on forest reserves from which they earn their living through taungya farming, hunting and fishing which contributes to their socio-economic

lives. The abundant forest resources in Nigeria if properly utilized are expected to enhanced agricultural production as well as production of non-timber forest products and will make agriculture sustainable and ensures continuity in products supply.

Judging according to the points raised, the wise use of forest resources will compliment agricultural produce for the realization of sustainable agriculture, by first knowing the roles these resource plays. Once their service roles in human needs are known, the next step would be how to conserve and determined what method is appropriate for sustained harvesting. Forest resources must therefore be conserved and wisely utilized on order to attain sustainability in agriculture. To ensure this, the following should be vigorously pursued:-

1.3.1 Participatory approach

To achieve a level of sustainability in agriculture through the complimentary role of forest resources, the rural communities should play active roles in the control, management and utilization of forest resources [12]. This can be based on the understanding of the need for conservation and the negative impacts of resources' overexploitation.

1.3.2 Public awareness

The way and manner which people make use of forest resources is because of the lack of basic information about the need to conserve the forest. Public education should be put in place through extension services, radio and television programmes, seminars, workshops and symposia [13]. Public awareness will drive home the ethics of conservation among resources users which in turn would create consciousness and carefulness in resources utilization. Once there is carefulness in utilization otherwise, wise use, there is the sure possibility of resources availability which goes to enhance sustainable agriculture.

1.3.3 Multiple land use forestry

Multiple denotes the management of the forest in a manner that, while conserving the basic land resources, will yield a high level of production in the five major uses:- wood, forage, water, recreation and wildlife, for the long-run benefit of the largest possible number of people [4].

1.3.4 Farm forestry

Farmers need to be encouraged to plant trees on their farmland to meet the domestic needs of the family. Farmers should be encouraged to grow trees for their multiple purposes, such as the provision of shade for the agricultural crops, wind shelters, soil conservation, as well as food.

1.3.5 Agroforestry

In a lay man language, agroforestry could be viewed as growing of forest tree along with agriculture crop on the same piece of land. In a more scientific way agroforestry may be define as a sustainable land use system that maintains or increases the total yield by combining food crop together with forest trees and livestock ranching on the same unit of land, using management practices that takes care of the social and culture characteristics of the local people and the economic and ecological condition of the local area [14]. The benefits such practice may be from sale of timber, but it could be through the increased yield of crops and livestock as a result of shelter from winds, reduction in soil erosion, amelioration of soil salinity or acidity, etc. If agroforestry could enhance soil fertility then its wider adoption would lead to sustainable agriculture.

1.3.6 Reduction in waste of forest resources

Forest resources should be used in a way such that unnecessary waste is minimized. The gains of such a careful use is two-fold:- with less waste of forest resources, less forest area needs to be harvested to meet a given demand for timber and carefully harvested forests have greater conservation value than those that are carelessly harvested [4]. Better technology and better harvesting equipment should be developed.

2. CONCLUSION

It has made evident that forest resources compliments agriculture products. While expanding agriculture production, concerted efforts towards efficient utilization of forest resources and their conservation should be pursued alongside, for sustainable agriculture. An organized method of forest resources removal or harvest would ensure wise use, exclude over exploitation and reduce waste thereby making agriculture sustainable since resources are being supplied from dual sources-forest and agriculture.

COMPETING INTERESTS

Author has declared that no competing interests exist.

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