

CHAPTER 1

Harnessing the Potentials of Sustainable Forest Management for National Development in Nigeria.

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Abstract

National development is the ability of a nation to improve the lives of its citizens through the provision of good nutrition and social amenities like quality education, potable water, good roads and medical care. Sustainable forest management is the process of managing forest resources to meet the forest resources needs of the present generation while not compromising the ability of the forest to meet the forest resources needs of the future generation. Sustainable forest management has great potentials in ensuring national development through improving agricultural production system, increasing food production, increasing income earnings of the people, provision of medicinal materials and improving the well-being of the people. However the problems of deforestation and illegal felling have been reducing the potentials of sustainable forest management towards contributing to the national of the country. It is in view of this that this paper examined the ways by which the potentials of sustainable forest management in promoting national development can be harnessed. These ways include; involvement of rural dwellers in forest protection, organizing workshops for dealers in forest products, improved forestry extension, encouraging the practice of forest certification, promoting tree planting, establishment of communal woodlot and promoting agroforestry practices.

Key words: Sustainable Forest Management, National Development, Forestry Extension, Forest protection and Forest Certification.

Introduction

The forest and its resources is a highly valuable asset to many people in Nigeria. This is because the welfare and the well-being of many Nigerians are intricately linked with the forest and its resources. Ehiagbanare (2007) stated that forests are known to be crucial to the welfare of man and play a very key role in climate and water cycles control. The dependence of the people on the forests is unlimited. This is because the forests have traditionally yielded a great variety of useful products. These products and the forest itself play critical roles in the environment, situation, needs, and even life line. (Adeyoju, 2001). Forest resources are of particular importance to a great majority of the people of this country because many rely on them for their subsistence needs and for the support of their livelihood. Unfortunately the area covered by the forest has been on the decline in many parts of the country. The reason for this is not unconnected with the increasing population and the resultant over exploitation of forest resources in many places. This has resulted in decreasing availability of forest resources to the people. As noted by Adedayo

(2005) today, the situation in most part of the country is such that the trees in the forest, the land, the people as well as the entire rural environment are no, longer at ease. This is because the forest which most of the time provide succor to many people in terms of food and income have been abused and over exploited in many places. The resultant effect is dwindling availability of forest products and services for the use of the people. This has therefore reduced the potentials of the forest and its resources from contributing to the national development of the country. Table 1 shows the trends in extent of forests between 1990 and 2010 in Nigeria. The Table shows that there has been a declining trend in the forest cover in the country.

Table 1: Trends in extent of forests between 1990 and 2010 in Nigeria.

	Forest area (1000ha)					Annual change rate				
	1990	2000	2005	2010	1,000 ha/yr	1990 -2000 %b	2000 -2005 1000 ha/yr	2005-2010 %b	1000 ha/yr	%b
Forest type	17234	13137	11089	9041	- 410	- 2.68	- 410	-3.33	- 410	- 4.00
Total forest area										
Primary forest	1556	736	326	ns	- 82	- 7.21	- 82	-15.03	- 65	-
Forest plantations	251	316	349	382	7	2.33	7	2.01	7	1.82

Source: FAO (2010).

In order to stop the dwindling availability of forest resources and services to the people, attempts have been made in all the states of the federation to promote sustainable forest management (SFM). SFM is the process of managing forests to achieve one or more clearly specified objectives of management on a continuous basis without undue reduction of its inherent values and future productivity and without undue undesirable effects on the physical and social environment. It therefore follows that SFM will enhance the capacity of the forest to meet the forest resources needs of the people- especially the food needs of the people. As noted by Lipper (2000) forests and the benefits they provide in the form of food, income and watershed protection have an important and often critical role in enabling people around the world to secure stable and adequate food supply. He noted further that deforestation and forest degradation impair the capacity of the forests to contribute to food security.

Unfortunately, in their bid to meet their subsistence, needs including fuel, shelter many people (especially the rural dwellers) engage in reckless and destructive use of forest resources. This has resulted into various environmental problems such as erosion, flooding, drought and eventually global warming. In order to stem down this ugly trend, there was a need to put in place measures that will help to protect the forest and its resources in the country. This was the genesis of sustainable forest management.

Concept of Sustainable Forest Management

Sustainable Forest Management (SFM) is a concept that has evolved out of the necessity to judiciously manage forest resources to meet the forest resources needs of the present generation

while not compromising the ability of the forest to meet the forest resource needs of the future generation (Adedayo, 2014). As noted by Programme for the Endorsement of Forest Certification (PEFC) (PEFC, 2014) SFM is an evolving process and the parameters defining it change over time based on the latest scientific knowledge and society's understanding of the concept. Sustainability and sustainable forest management are old concepts, even though new light was shed on the issue in more recent times (FAO, 2014). International Tropical Timber Organisation (ITTO) (ITTO, 2004) defined sustainable Forest Management as the process of managing forest to achieve one or more clearly specified objectives of management with regard to the production of a continuous flow of desired forest products and services without undue reduction of its inherent values and future productivity and without undue undesirable effects on the physical and social environment. It is therefore essential to note that all the potentials of forestry in contributing to national development is subsumed under the concept of sustainable forest management.

Concept of National Development

Development is a desirable change that brings improvement in the standard of living of the people especially their nutritional status, improvement in health, increase in real income of the people and per capita income as well as improvement in the educational achievement or access to education, fairer distribution of income and better livelihood options. As noted by Dawe (2018) national development is the ability of a county or countries to improve the social welfare of the people e.g. by providing social amenities like quality education, potable water, transportation infrastructure and medical care. In the same vein www.reference.com (2018) defined national development as the ability of a nation to improve the lives of its citizens. Measures of improvement may be material, such as an increase in the gross domestic product, or social, such as literacy rates and availability of healthcare. Development helps to bring improvement into all aspects of human lives including income and consumption levels. However, achieving this development in Nigeria and in many other African countries seems to be a herculean task (Adedayo, 2018). This is as a result of failure on the part of government and individuals to take advantage of the country's human potentials and resource endowment. Measures of improvement may be material, such as an increase in the gross domestic product, or social, such as literacy rates and availability of healthcare. To achieve this development many countries embarked on development strategies code-named National Development Plan (NDP). This is a long/ medium-term development plan, developed by the government (National Planning Commission) to ensure that strategies are put in place to achieve national development and at the same time ensure that the strategies are followed.

Potentials of Sustainable Forest Management to National Development in Nigeria

1. Improving Agricultural Production.

Sustainable forest management has great potentials in promoting agriculture which can help to bring improvement to food production and which will lead to rapid national development. This is because forest is known to play important role in supporting and improving agricultural production systems which help to improve availability of food to the people. One of the vital indices of national development is improvement in nutrition and availability of food to the people. Sustainable forest management help to ensure continuous availability of the forests and

by extension help to support agricultural systems. Forests and trees support sustainable agriculture which leads to improved food production. As a matter of fact sustainable forestry is the backbone of sustainable agriculture and sustainable agriculture ensures food security.

Forests and trees support or improve agricultural production in the following ways:

- a. *Improvement of soil fertility*:- Forests and trees help to improve soil fertility in diverse ways and through that improve land productivity cum food productivity. Some forest trees are legumes. They help to convert atmospheric nitrogen to soil nitrates there by increasing the fertility of the soil. Examples include: *Parkia biglobosa*, *Leucina leucocephala*, *Gliricidia sepium*, *Cassia siamia* e.t.c. Many forest trees have deep root system. They can help to reabsorb nutrients that have been lost through leaching.. Forest trees therefore help to bring back to use lost nutrients. Forest trees also help soil fertility through leaf litter fall. Nutrients in the leaves that have reached senescence are reabsorbed back into the soil through leaf litter fall. It therefore follows that through all the aforementioned means forest trees can help to increase soil productivity which leads to increased food production and by extension national development.
- b. *Control of erosion*: - It is a known fact that erosion can reduce soil fertility tremendously thereby reducing soil productivity and by extension food production. However forest trees can help to effectively check the forces of soil erosion and help to increase food productivity. Forest trees and other vegetative coverings can effectively check water erosion as well as forces of wind erosion. Oke (2001) noted that agroforestry can help to effectively control erosion. Agroforestry can do this because of the presence of the tree component. When forest trees control erosion they improve growth of agricultural crops which leads to increase in food production and national development.
- c. *Protection of the Watershed*:- The protection offered by the forest to the watershed is very important in ensuring that all the populations that live close to major rivers and streams or that derive their livelihood from these rivers or streams are food secure. This is because the protection offered by the forest to the watershed of these rivers and streams help to protect the livelihood of farmers and fisher men. Most often when the watershed is not protected, it results into serious flooding which destroys many farm lands and fish ponds making many people to become vulnerable to food insecurity. Sustainable forest management will ensure that watersheds are protected with the continuous presence of forest trees thereby securing the livelihood of farmers and fishermen and by extension ensuring that they are food secure and through that promote national development. Forests and the benefits they provide in the form of food, income and watershed protection have an important and often critical role in enabling people around the world to secure a stable and adequate food supply. Forests are important to the food insecure because they are one of the most accessible productive resources available to them (Lipper, 2000).

2. Provision of Food.

One of the glaring contributions of SFM to food production in Nigeria is provision of food to the people. Forest provides diverse types of food to a many of the rural dwellers and urban poor that are food insecure. When forests are sustainably managed then there is a guarantee that people will have access to forest foods both now and in the future most especially the rural poor. Sene (2000) noted that trees and forests contribute to improving the well- being of local populations

by providing a wealth of food, flavourings, medicines and beverages. Forests and trees provide food in the form of fruits, nuts, wild vegetables, wild animals, mushrooms, honey and snails. Table 2 shows a list of forest plant species that provide food to the people either as fruits or as leaves which serve as vegetables. It is important to also note that many of these forest fruits and leaves are very rich in vitamins, minerals and proteins. For instance *Blighia sapida* one of the common forest fruits in Nigeria has 65mg of vitamin C, 98mg of phosphorus and 8.8g of protein per 100gm of fruit (Table 3). Table 4 also shows the mineral composition of three species of snails in Nigeria. This shows that snail which is a prominent forest food is rich in calcium, sodium, iron and chlorine which are very important to human nutrition. Warner (2000) noted that forests are the source of a variety of foods that supplement and complement what is obtained from agriculture. This shows that foods obtained from the forests play important role in ensuring that a lot of people have access to good nutritional foods in Nigeria which is an important indices of national development. Majority of rural households in developing countries and a large proportion of urban households depend on plant and animal products of the forests to meet some part of their nutritional, cooking and or health needs (Byron and Arnold, 1999).

Forest foods are even much more important in ensuring food security to the people during emergencies and difficult periods. This includes periods of drought, famine,, floods, wars or insurgency as well as during dry season It is a well known fact that poor people live precariously without any savings against emergencies or crop failure. Forest foods therefore provide cushion against these adversaries.

Table 2: List of Forest Plant Species that provide edible Fruits or Leaves to the people in Nigeria.

S/N	Name of Plant Species	Type of Food provided
1	<i>Adansonia digitata</i>	Fruit and Leaves
2	<i>Artocarpus cuminis</i>	Fruit
3	<i>Blighia sapida</i>	Fruit
4	<i>Borrassius aetopium</i>	Fruit
5	<i>Chrysophyllum albidum</i>	Fruit
6	<i>Dacryodes edulis</i>	Fruit
7	<i>Garcinia cola</i>	Fruit
8	<i>Gongronema latifolium</i>	Leaves
9	<i>Irvingia gabonensis</i>	Fruit
10	<i>Moringa oleofera</i>	Leaves
11	<i>Morus mesozygia</i>	Fruit
12	<i>Ocimum gratissimum</i>	Leaves
13	<i>Parkia biglobosa</i>	Fruit
14	<i>Spondias mombin</i>	Fruit
15	<i>Tamarindus indica</i>	Fruit
16	<i>Tetracapidium conophorum</i>	Fruit
17	<i>Treculia africana</i>	Seed
18	<i>Vernonia amygdalina</i>	Leaves
19	<i>Vitellaria paradoxum</i>	Fruit
20	<i>Vitex doniana</i>	Leaves

Source: Adapted from Fuwape (2005); Babalola and Agbeja (2008).

Table 3: Nutritional Composition of *B. sapida* (per 100g of fruit).

Nutrient	Composition (per 100g)
Fat	18.8g
Protein	8.8g
Phosphorus	98mg
Iron	0.5mg
Niacin	3.7mg
Vitamin C	65mg

Source: Montoso Gardens (2007).

Table 4: Mineral composition (mg/100g) of the albumen gland of three species of snails.

Snail species	Ca ₂₊	Na ⁺	Fe ₂₊	Cl ⁻
<i>A. maginata</i>	1.91±0.01	0.62±0.02	0.1±0.0	0.09±0.01
<i>A. achatina</i>	1.87±0.01	0.54±0.01	0.1±0.01	0.09±0.01
<i>A. fulica</i>	1.92±0.01	0.52±0.01	0.08±0.02	0.08±0.01

Source: Ademolu *et al.* (2017).

Forests and tree stocks have an important role as a reserve or safety net, providing both subsistence foods and income in times of crop failure, short fall, unemployment or other emergency or hardship or to meet exceptional needs (Warner, 2000). He noted further that forest foods are most extensively used to help meet dietary short falls during particular seasons in the year. Every rich forest foods such as roots, tubers, rhizomes and nuts are especially important in emergencies such as floods, famines, droughts, and wars. From the foregoing, it therefore follows that when the forest is sustainably managed, it will help to rich foods to the people to meet the nutrients needs of the people continuously both now and in the future. This in essence is what will bring national development because the people will be full of energy and vigour to be fully engaged in their livelihood.

3. Provision of Income.

Income is one of the indices of national development. The income earned by an individual or household has an important role to play in ensuring national development. It is important to note that the income an individual earns as household head help to ensure the access of his household to food which is an important indices of national development. It is important to note that many households especially in the rural areas depend on the forests to earn income which has been helping them to have access to food, education and health services. Warner (2000) noted that earnings from forest products are often important as a compliment to other incomes. Very large numbers of households generate some of their income from selling forest products, often on a part- time basis because their main livelihood cannot provide enough income that can meet their needs. Sustainable forest management by ensuring continuous availability of the forest therefore help to ensure that people earn income from the forest continuously. It therefore follows that income earned from forest products and other forest related activities through sustainable forest

management can help to ensure national development. Adedayo (2018) noted that one of the indices of national development is fair distribution of income. National development cannot be achieved in any decisive manner without an increase in the income earnings of the majority of the grass root people. It is increasing in the income of the majority of the grass root people that will lead to a fairer distribution of income which will bring about national development.

4. Provision of Medicinal Materials.

Forests are known to provide medicinal materials that are used in curing different kinds of ailments. It is the medicinal materials provided by the forest to the people that has helped majority of them to be in a state of good health. The health of an individual and by extension the health of a community is important to the survival, welfare and development of the individual or community. Adedayo (2007) noted that many Nigerians and other African countries sought alternative medical care through the use of medicinal plants in order to maintain their health and cope with the rigours of daily struggle for survival and hard work. He noted further that for millions of the poor people in tropical African countries, forest plants are well cherished and sought for medicinal use. It is when people are in a state of good health that they can be engaged in hard work that can bring about development. WHO (2000) noted that though it has not been scientifically proven but it has been observed and locally proven that traditional medicine are well known to be used in the treatment of various human ailments especially by the rural people in developing countries. They also provide the necessary nutrients for the growth and development of the human body. Sustainable forest management by ensuring the continuous existence of the forests therefore help to ensure continuous availability of medicinal materials to the people and thus help to ensure that the people continue to enjoy good health and continue in their hard work which will lead to development. Table 5 shows a list of plant materials that are used for medicinal purpose by rural women in Kogi State, Nigeria.

5. Increased well-being:

The continuous availability of the forest and its resources to the people can help to increase the wellbeing of the people. Human well-being has to do with the state of health, nutrition, happiness and safety of the people. It is the general state of welfare of the people. In Nigeria, the occurrence of many problems like erosion, flooding, decreasing soil fertility and deforestation has brought untold hardship and low well-being to the people. Sustainable forest management by ensuring continuous availability of forests and its resources can help to reduce this hardship and improve the well-being of the people.

This is done by providing opportunities for people to have access to forest foods thereby improving the nutrition of the people, by providing opportunities for people to sell forest products and also opportunities to turn forest products into simple utilitarian products which are sold to earn income. The income earned from forest products are used to have access to better health services and to pay for children school fees. All these help to improve the well-being of the people. The importance of sustainable forest management in improving the well-being of the people cannot be over emphasized considering the fact that improved human well-being is an antidote to poverty side effects. Warner (2000) noted that forestry activities that support access of people to resources, improve their participation in decision making and equity assist in increasing their well-being especially that of the poor.

Table 5: Common Medicinal Plants used by rural women in Kogi State, Nigeria.

Name of plant	Lokoja		Kotonkarife		Ajaokuta		Okene		Adavi	
	N	%	N	%	N	%	N	%	N	%
<i>Vernonia amygdalina</i>	10	25	11	28	10	25	13	33	10	25
<i>Azadirachta indica</i>	7	18	8	20	12	30	11	28	8	20
<i>Psidium guajava</i>	3	8	0	0	3	8	1	3	3	8
<i>Carica papaya</i>	5	13	2	5	3	8	8	20	3	8
<i>Cassia alata</i>	5	13	1	3	6	15	3	8	5	13
<i>Moringa oleifera</i>	10	25	5	13	4	10	4	10	7	18
<i>Mangifera indica</i>	10	25	4	10	2	5	10	25	10	25
<i>Garcinia cola</i>	2	5	6	15	0	0	6	15	7	18
<i>Spondias mombin</i>	1	3	5	13	2	5	3	8	4	10
<i>C. albidium</i>	0	0	0	0	0	0	3	8	6	15
<i>Aloe barteri</i>	10	25	5	13	3	8	9	23	7	18
<i>Allium cepa</i>	2	5	3	8	3	8	3	8	4	10
<i>Annona senegansensis</i>	8	20	7	18	9	23	5	13	0	0
<i>Calotropis procera</i>	0	0	1	3	0	0	1	3	2	5
<i>Daniellia oliveri</i>	1	3	1	3	0	0	2	5	2	5
<i>Zingiber officinale</i>	4	10	2	5	0	0	2	5	2	5
<i>Piliostigma thonningi</i>	0	0	0	0	0	0	2	5	8	20
<i>Vitex doniana</i>	1	3	4	10	1	3	2	5	4	10
<i>Cola nitida</i>	1	3	2	5	0	0	2	5	1	3
<i>Terminalia ivorensis</i>	4	10	3	8	8	20	6	15	9	23
<i>Jatropha curcas</i>	5	13	12	30	3	8	4	10	8	20
<i>Momordica charantia</i>	9	23	1	3	2	5	2	5	2	5
<i>Anthocleista djalensis</i>	3	8	0	0	0	0	1	3	1	3
<i>Khaya senegalensis</i>	0	0	0	0	0	0	0	0	2	5
<i>Adansonia digitata</i>	5	13	9	23	0	0	3	8	5	13
<i>Parkia biglobosa</i>	0	0	2	5	0	0	1	3	0	0
<i>Piper guineense</i>	5	13	3	8	0	0	0	0	2	5
<i>Waltheria indica</i>	0	0	0	0	1	3	0	0	0	0
<i>Musa paradisiaca</i>	0	0	2	5	3	8	3	8	3	8
<i>Pupalia lappacea</i>	2	5	0	0	1	3	0	0	1	3
<i>Morinda lucida</i>	0	0	1	3	1	3	1	3	3	8
<i>Dacryodes edulis</i>	0	0	4	10	0	0	0	0	7	18
<i>Cassia siamea</i>	2	5	2	5	0	0	0	0	1	3
<i>Alstonia boonei</i>	0	0	1	3	0	0	2	5	0	0
<i>Xylopi aethiopia</i>	6	15	4	10	1	3	1	3	1	3
<i>Ocimum gratissimum</i>	5	13	1	3	4	10	3	8	6	15
<i>Azalia africana</i>	1	5	3	8	0	0	1	5	1	5
<i>Fagara zanthoryloides</i>	0	0	2	5	1	3	0	0	3	8

Source: Adedayo and Oyun (2017).

Ways to Harness the Potentials of Sustainable Forest Management for National Development in Nigeria.

1. Involvement of Rural Dwellers in Forest Protection.

It is important that rural dwellers be involved in the protection of forest reserves in the country. This will help to curtail all manners of illegal activities inside the forest reserve and by extension help to promote sustainable forest management. Evidences all over the country have shown that uniform men are finding it difficult to curtail illegal activities inside forest reserves. Adetula (2008) noted that in many communities in Ondo State some youths have constituted themselves into gangster making it difficult for forest uniform men to curtail illegal forestry activities. He noted further that some uniform staff have been attacked sometimes resulting into death.

The use of rural dwellers in forest protection can be very effective because they live very close to the forest reserves. They know the terrain of the reserves and they can easily be on the tail of any forest offender. As such for effective forest protection which will help to sustain sustainable forest management it is essential to involve rural dwellers in the protection of the forest.

2. Organizing Workshops for Dealers in Forest Products.

There is the need to organize workshops for dealers in forest products. Either those that sell forest products directly or those that are involved in the processing of forest products. The workshop will help to enlighten them and raise their awareness on the wise-use of forest resources to ensure sustainability.

3. Improved Forestry Extension.

Forestry extension is an out of school educational service directed towards informing people about forestry activities especially about innovations in forestry. Today in many parts of the country forestry extension is yet to be well developed. As such many people in the country especially the rural dwellers are still ignorant of forestry activities especially on the need to conserve the forest or use forest resources wisely. That is why many rural dwellers in the country today are involved in massive over-exploitation of forest resources resulting in deforestation.

There is therefore the need to improve forestry extension in order to get many people educated and enlightened about forestry activities and more specifically about the danger of deforestation. It is important to let people know the dangers of deforestation which include; erosion, soil degradation, poor farm yield, biodiversity loss, frequent storm, scarcity of forest products e.t.c. It is when people know the dangers of deforestation that they may be convinced not to be involved in deforestation.

4. Encouraging the Practice of Forest Certification.

Forest certification is a voluntary process used by forestry organizations to reassure consumers that the wood and wood products they buy come from sustainably managed forests (Forestry Focus, 2019). Forest certification arose out of the need to control the destruction of the world's forest resources, particularly in tropical areas. Despite several international attempts made at curbing the destruction of the forests which were largely ineffective, it was at the [Earth Summit](#) held in Rio de Janerio in 1992 that real progress was made (Forestry Focus, 2019), The sale of illegally or unsustainably harvested timber has been and continues to be a major issue that

contributes to deforestation around the world (PEFC, 2019). As such, when the practice of forest certification is encouraged in Nigeria it will help to curb illegal felling and destruction of the forest thereby paving way for sustainable availability of forest resources and by extension the benefits of sustainable forest management which will help to promote national development.

5. Promoting tree planting and establishment of Communal woodlot.

Another way by which the contributions of SFM to national development can be harnessed is by promoting tree planting among the people and the establishment of communal wood lots. State forestry departments in the country should embark on massive production of tree seedlings which will be distributed to interested individuals in the various states. Closely related to this is the establishment of communal woodlots in rural communities all over the country. The significance of these two activities to SFM is that they will help to curb the destruction of the forests. Research has shown that cutting wood for fuel has been one of the prominent ways of forest destruction in Africa (Adedayo, 2007, Sene, 2000 and Aikhionbare, 2015)). When people plant trees and when woodlots are established in the rural areas it provides avenue for people to get wood for fuel. This will help to prevent the destruction of the forest.

6. Promoting Agroforestry Practices.

FAO (2015) defined agroforestry as a collective name for land use systems and technologies where woody perennials (trees, shrubs, palms, bamboos, etc.) are deliberately used on the same land management units as agricultural crops and/or animals, in some form of spatial arrangement or temporal sequence. There must be both ecological and economic interactions between the woody and non-woody components to qualify as agroforestry. (Nair, 1993). What is important in an agroforestry practice is tree planting. It therefore follows that when agroforestry practice is promoted or encouraged among farmers, tree planting is encouraged and the people will enjoy many benefits of trees including erosion control, provision of food and raw materials which will lead to national development.

Conclusion

This study examined the potentials of sustainable forest management for national development and how these potentials can be harnessed for national development in Nigeria. Sustainable forest management has the following potentials for national development; improving agricultural production, provision of food, income, medicinal materials and promoting improved well-being of the people. The study showed that the potentials of SFM in contributing to national development can be harnessed by involving the rural dwellers in forest protection, organizing workshops for dealers in forest products, carrying out improved forestry extension, encouraging the practice of forest certification, promoting tree planting and establishment of wood lots in the rural areas and encouraging the practice of agroforestry among the farmers.

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