



Policies and Strategies to improve the utilization of *Blighia sapida* (K Konig) in the Rainforest and Guinea savanna ecological zones of Nigeria

ADEDAYO, A.G

Department of Forestry and Wood Technology, Federal University of Technology, Akure, Nigeria.

Abstract

This paper takes a look at the various ways that the fruits of *B. sapida* are being utilized by the people in the rainforest and guinea savanna ecological zones of Nigeria. This is with a view to fashion out policies and strategies that can help to improve the utilization of *Blighia sapida* fruits to reduce poverty in the study area. *B. sapida* has been underutilized in the study area and it is believed that improving its utilization through clearly spelt out strategies will go a long way in helping to improve its utilization in the study area. Semi structured questionnaires were used to collect information on the indigenous uses of *B. sapida* in the two ecological zones. Two communities in each ecological zone were purposively selected. 50 respondents in each sampled community were randomly selected to investigate the indigenous uses of *B. sapida* in the two ecological zones. Chi-square test ($p < 0.05$) shows that a significant association exists between indigenous uses of *B. sapida* and ecological zones as well as between indigenous uses of *B. sapida* and economic class of respondents in the study area. There is however the need to harmonize the indigenous uses of *B. sapida* in order to improve on the utilization of the species. In the light of this, it is essential that policies that will help to promote the utilization of *B. sapida* and other neglected or underutilized species (NUS) be enshrined in the forest policy statement of the states covered by the study. Promoting the conservation of NUS plants should also be included in the forest policy statement of the states covered by the study. NUS unit in the State Forestry Departments in the country should be created that will help to promote the utilization of *B. sapida* and other NUS plants all over the country through proper and prompt dissemination of information. Other strategies that can help to promote the utilization of *B. sapida* include; commercialization of *B. sapida*, value addition to the fruits of *B. sapida*, selling the fruits in urban markets as well as exporting the fruits in order to improve income earnings from the fruits.

Key Words: *Blighia sapida*, Rainforest, Guinea savanna, ecological zone, Neglected and underutilized species,

Introduction

Blighia sapida (Ackee apple) is an evergreen, fruit bearing tree that is native to the tropical West Africa (Wikipedia, 2013). It belongs to the family sapindaceae. At maturity it can grow to about 10 -18metres tall. It has a short trunk and a dense crown. *B. sapida* has flowers that are greenish, small, staminate and hermaphrodite, in axillary racemes. During its fruiting season (usually between January – March and June – July) it produces many fruits. Its fruits are pear shaped. They are green when not ripe but turns to bright red or yellow – orange when ripen. The fruit is 5 -10 cm long opening at maturity with 3 cream coloured arils, each tipped with a black seed (Montoso

Gardens, 2007). The fruit typically weighs between 100-200g (Wikipedia, 2013). *B. sapida* fruits are normally allowed to ripen and open naturally on the tree before it is plucked for use. The unripen fruit and the inedible portion of the fruit are poisonous. However the poison in the edible portion (aril) is known to reduce drastically when the fruit ripens and split open and is exposed to light (NTBG, 2013). *B. sapida* contains 18.8g and 8.8g of fat and protein respectively (Table 1). It is however believed that *B. sapida* is underutilized by many people in Nigeria. The reasons for this might probably be due to the presence of poison in the seeds and unripen arils and partly because there is a great limitation in the body of indigenous knowledge

about its uses available to the people. It is therefore essential that policies and strategies that can help improve its utilization be sought in order to improve its utilization and its contribution to household poverty reduction. *B. sapida* is an important forest fruit in Nigeria and forest fruits constitute a very important segment of non-timber forest products (NTFPs) in Nigeria.

Table 1: Nutritional Composition of *B. sapida*

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

Policy is a purposeful course of action adopted and pursued by an individual, group or government. It is a rational system based on deliberate aims and plans. Policy is intended to guide and determine present and future decisions (Asia –Pacific Forests and Forestry to 2020, 2013). In the same vein strategy is a plan that is intended to achieve a particular purpose or aim. It is an act of planning and directing activities to achieve specific aim.

This paper therefore takes a look at the various indigenous uses of *B. sapida* in the rainforest and guinea savanna ecological zones of Nigeria. This is with a view to fashion out policies and strategies that can help to bring improvement in the utilization of *B. sapida* in these ecological zones. Thereby helping to improve the contribution of *B. sapida* to household poverty reduction in the study area.

Concept of non-timber forest product governance

Non-timber forest product (NTFP) governance is a recent concept that denotes the process of rule and decision making concerning production and marketing and it is more than rule making and include a broader societal process based on social practices, values and principles (Wiersum *et al.* 2013). This process is characterized by the coexistence of formal and informal institutions based on plural statutory, customary and market norms. Ros–Tonen and Kusters (2011) also defined NTFP governance as the multi-stakeholder and multilevel process of interactive decision making and creation of institutional frameworks for the allocation, use and trade of NTFPs. The concept of NTFP governance emerged as an analogous to the older concept of forest governance: a process that defines the purposes for which forests are managed and the conditions under which different stakeholders have access to decision-making and implementation processes (Lemos and Agrawal, 2006).

Kooiman and Bavinck (2005) use the term ‘interactive governance’ to refer to the interactive process between actors from the state, private sector and/or civil society at multiple scales aimed at ‘solving societal problems and creating societal opportunities.’ They distinguish between hierarchical governance, co-governance and self-governance, which corresponds with Arts and Visseren-Hamakers’ (2012) distinction between governing by, with and without the state respectively. Forest governance was a concept that evolved out of the need to devolve the management of forest resources. It involves planning, utilizing and managing forest lands and resources through joint efforts of forest officials and the local community dwellers (Akinola, 2000). It is important that forest policies especially that of governance be tailored in a way that the primary focus will be on maintaining sustainability of the forest and at the same time meeting the needs of the local

community dwellers living close to the forest. Neumann and Hirsch (2000) noted that it is difficult to conceive of developing principles for NTFP harvesting equivalent to those associated to harvesting of timber. Nevertheless what makes NTFPs different from timber and important as a conservation strategy is the assumption that the forest remain mostly intact and more or less biologically intact under sustained NTFP harvesting. This accounts for much attention given to commercial NTFPs as the foundation upon which to build policies of conservation and development (Neumann and Hirsch, 2000). According to Brown *et al.* (2002) local governance of NTFPs plays important role in reconciling concerns about dwindling forest resources and poverty among forest dwelling people. The dwindling forest resources and poverty among the forest dwelling people was a concern because it was thought that poor people may result to massive exploitation of NTFPs which may have negative impact on the forest ecosystem. However commercial exploitation of NTFPs has been recognized as an activity that has minimal impact on the forest (Peters *et al.*, 1989) and it can as well play important role as a source of food and a source of income in situations where alternative livelihood activities are scarce (Sunderlin *et al.*, 2005).

It is important to note that the concept of NTFP governance was given prominence due to much attention that has been given to NTFPs recently. Non-timber Forest products (NTFPs) have for long been neglected by development planners in the development plans for Nigeria. Attention has majorly been focused on timber products. However in the past few decades attention has changed to NTFPs. It seems foresters and development planners have suddenly realized the importance of NTFPs more than ever before in the support of many livelihoods and in the supply of many benefits to many people. Some of the benefits include medicinal, cultural and social including

provision of income to many forest dependent people. Belcher *et al.* (2005) noted that increased interest in NTFPs began in the late 1980s and early 1990s in conjunction with increasing global concern about environmental issues especially deforestation, with increased attention on rural poverty and with the emergence of the concept of sustainable development.

The utilization of forest fruits is an important and crucial aspect of NTFP utilization in Nigeria. This is because forest fruits are among the key NTFPs that provide income and compliment the food intake of many rural and urban poor in the country. As such the exploitation of forest fruits by the people is guided by regulations. Though many of these regulations are informal, they are strictly followed by the people and it determines access to the use of forest fruits and other NTFPs. Adedayo (2010) noted that rural dwellers in Nigeria adhere strictly to their customary tenurial rights even though they are mostly informal, and that these customary tenurial rights determine ownership and access to many NTFPs.

In Nigeria *B. sapida* is one of the forest fruits utilize by the people. This tree species is commonly found on abandoned private lands, farmlands, around houses and on communal lands. Whoever owns the land on which the tree is growing owns the tree. He determines who have access to the fruits of the tree. Generally however the wife and the children of the owner of the tree usually harvest the fruits of the trees either for domestic consumption or for sale or as a gift to friends, neighbors or relatives. However, those *B. sapida* trees that grow on communal lands are subjected to the regulations or principles of NTFP governance or common property management.

Methodology

Study Area

The study area is two ecological zones, namely the rainforest and guinea savanna ecological zones of Nigeria. The rainforest ecological zone in Nigeria is located between latitude 6° 39' and latitude 7° 35' N and longitude 3°56' and 10°38'E. The guinea savanna is located between latitude 7° 36' and latitude 10°58' N and longitude 3° 54' and 9° 47'N.

Data Collection and Data Analysis

Two communities in each of the two ecological zones were purposively selected based on the presence of key informants in the communities who can give in depth information on the various indigenous uses of *B. sapida* in their communities. The selected communities are Ile-Ife in Osun state and Ikere in Ekiti state both of which are in the rainforest, while Igbaja in Kwara state and Shaki in northern part of Oyo state are in the guinea savanna ecological zone (Table2). Fifty (50) households were randomly

selected in each community to make a total of 200 respondents. Semi-structured and pre-tested questionnaires were administered in 2012, either to the wife of the household head or in some cases the questionnaire was jointly answered by the household head and his wife.

The data was subjected to descriptive analysis using frequency and percentage distribution tables. Chi-square was used to carry out statistical test on research hypothesis stated below.

Hypotheses tested

- i. Indigenous uses of *B. sapida* is independent of the educational qualification of respondents in the study area.
- ii. Utilization of *B. sapida* is independent of the economic class of respondents in the study area
- iii. There is no significant association between ecological zone and indigenous uses of *B. sapida* in the study area.

Table 2: Questionnaire Administration in the Study area.

Ecological zone	Name of community	Number of questionnaires administered	Number of questionnaires retrieved	Percentage (%)
Rainforest	Ile-Ife	54	50	93
Rainforest	Ikere	52	50	96
Guinea savanna	Igbaja	51	50	98
Guinea savanna	Shaki	54	50	93

Results and Discussion

Educational qualification of respondents and the use of *Blighia sapida*

The results of the study showed that majority of the respondents in the study area have no formal education. In Igbaja and Shaki 42% and 48% of the respondents respectively had no formal education. 40% had primary education in Ile-Ife while only 4% had tertiary education in Shaki (Table3). Chi-square test (p< 0.05) shows that there is strong association between educational qualification of respondents

and the uses of *B. sapida* in the study area (hypothesis1 and chi-square value in Table 6). This means that there is a strong connection between education and the use of *B. sapida*. The implication of this is that the educated seems not to use *B. sapida* like the uneducated people in the study area. This may be due to the fact that the educated, especially those with secondary and tertiary education, have better income and therefore use less of *B. sapida*. However those with no education and primary education have

lower and poor income and tend to use more of *B. sapida* in the study area.

Economic class of respondents and the use of *B. sapida* in the study area

Respondents in the study area were categorized into three economic classes based on income earned, type and nature of house they are living and other materials of value they possess such as land, vehicles, and television. The income earned by respondents was however the major determinant of economic class. This is because those earning higher income were the ones that are living in better houses and they possess more valuable things. Those earning ₦ 400,000.00 and above every month were regarded as high economic class. Those earning between ₦100, 000.00 and ₦ 400,000.00 per month were regarded as the middle economic class while those earning below ₦ 100,000.00 per month were regarded as low economic class. Table 4 shows that 2% and 4% of the respondents in Saki in the savanna ecological zone and Ile-Ife in rain forest ecological zone respectively are in the high economic class. 24% of the respondents in Igbaja located in the savanna ecological zone of the study area are in the middle economic class while 74% and 80% of the respondents in Ile-Ife and Ikere respectively are in the low economic class.

Chi- square test (p <0.05) shows that there is a significant association between uses of

B. sapida and the economic class of respondents in the study area (hypothesis 2 and chi-square value in Table 6). This means that the economic class of respondents affects the type and nature of uses of *B. sapida* in the study area. The poor rely much more on *B. sapida* and other forest fruits than those in the high economic class. This is because those in the low economic class use *B. sapida* for various purposes most especially to generate income, for food and for medicinal purposes Adedayo and Akindele (2003) noted that the rural poor rely heavily on forest fruits and other forest resources. This is because forest fruits and some other forest resources are among the productive resources that are easily available to local households through which they earn income and create wealth. In addition Arnold and Townson (1998) and Reddy and Chakravarty (1999) noted that forest products including foods and household items including the income generated from them can be quite significant to the food security of the local communities throughout the developing world many of which are food insecure. They maintained that the poorest households generally have the highest degree of reliance on forest products for income and food as they have the least access to cultivable land and so supplement their production with the gathering of forest products.

Table 3: Educational Qualification of respondents in the Study area

	Savanna				Rainforest				
	Igbaja		Shaki		Ile-Ife		Ikere		
	n	%	n	%	n	%	n	%	
No education	2	1	42	24	48	22	44	20	40
Primary education	16	32	18	36	20	40	21	42	
Secondary education	9	18	6	12	5	10	5	10	
Tertiary education	4	8	2	4	3	6	4	8	

Source: Field survey 2012

Table 4: Economic Class of respondents in the Study area

	Savanna				Rainforest			
	Igbaja		Shaki		Ile-Ife		Ikere	
	n	%	F	%	F	%	F	%
High Economic Class	2	4	1	2	2	4	0	0
Middle Economic Class	12	24	14	28	11	22	10	20
Low Economic Class	36	72	35	70	37	74	40	80

Source: Field survey 2012

Indigenous uses of *B. sapida* in the study area

Table 5 shows the various indigenous uses of *B. sapida* in the study area. Ninety six percent of the respondents in Igbaja and 80% of the respondents in Shaki (guinea savanna ecological zone) said they eat the aril of *B. sapida* raw. 82% of the respondents in Ile-Ife and 90% in Ikere (rainforest ecological zone) said they eat the aril of *B. sapida* raw. This shows that the aril of *B. sapida* fruit is eaten raw by many people in the two ecological zones. It is

eaten when the fruit ripens and it splits open. That is when the fruit is plucked from the mother tree and is eaten raw. At the point when the fruit split open, it is believed that the aril contains little or no poison and that it can be eaten without any risk. The seed (black portion of *B. sapida* fruit) and the unripen aril of *B. sapida* are poisonous. But the poison of the aril reduces drastically when the fruit splits open and it is exposed to light (NTBG, 2013).

Table 5: Indigenous uses of *B. sapida* in the study area

Uses	Savanna				Rainforest			
	Igbaja		Shaki		Ile-Ife		Ikere	
	F	%	F	%	F	%	F	%
Arils eaten raw	48	96	40	80	42	84	45	90
Arils use to prepare soup	40	80	38	76	39	78	41	82
Treatment of mouth sore	45	90	0	0	0	0	0	0
Used to treat weak children	0	0	15	30	36	72	0	0
For fish poison	7	14	0	0	0	0	0	0
Use as soap.	10	20	0	0	0	0	6	12
Seeds use to play local game ('ayo')	10	20	0	0	0	0	0	0
Treatment of epilepsy	0	0	11	22	0	0	0	0
Treatment of backache	0	0	0	0	0	0	20	40
Treatment of Chest pain	0	0	0	0	0	0	11	22
Treatment of stomach ulcer	0	0	0	0	0	0	8	16
Use to treat fever	0	0	11	22	0	0	3	6

 χ^2 Cal. = 388.36 χ^2 tab.=43.8d.f.=33 Source: Field survey 2012

Table 6: Chi square test results

Hypothesis	Chi- square calculated	Chi- square Tabulated	Degree of freedom
1. Education v/s uses of <i>B. sapida</i>	53.68	21.03	12
2. Economic Class v/s uses of <i>B. sapida</i>	46.61	31.41	20
3. Ecological zone v/s uses of <i>B. sapida</i>	388.36	43.80	33

Eighty percent and 76% of the respondents in Igbaja and Shaki respectively in the guinea savanna ecological zone of the study area use the aril of the fruit of *B. sapida* to prepare soup. 78% and 82% of the respondents in Ile-Ife and Ikere respectively also use the aril of the fruit of *B. sapida* to prepare soup. This also shows that the aril of the fruit of *B. sapida* is a soup delicacy that is consumed in both ecological zones. Chi-square test ($p < 0.05$) however showed that there is significant association between ecological zone and the indigenous uses of *B. sapida* in the study area (hypothesis 3 and chi-square value of Table 6). This means a significant difference exist in the indigenous uses of *B. sapida* in the two ecological zones. For instance in Igbaja (located in guinea savanna ecological zone) 14% of the respondents use the black portion of *B. sapida* fruit as fish poison, but none of the respondents in Ile-Ife and Ikere (based in rainforest ecological zone) use it as fish poison. Also in Shaki (located in guinea savanna) 22% of the respondents use *B. sapida* fruits in the treatment of epilepsy why none of the respondents in Ile-Ife and Ikere (located in rainforest zone) use it in the treatment of epilepsy. Also 40%, 22% and 16% of the respondents in Ikere (located in rainforest zone) use *B. sapida* fruit in the treatment of backache, chest pain and stomach ulcer respectively, but none of the respondents in Igbaja and Shaki (located in the guinea savanna zone) use the fruit for any of the stated problems. In Igbaja, (located in the guinea savanna zone) 90% of the respondents use *B. sapida* fruit in the treatment of mouth sore but none of the respondents in Ile-Ife and Ikere (in rainforest zone) use it to treat mouth sore. It

therefore follows that great variation exist in the indigenous uses of *B. sapida* among the people living in the guinea savanna and rainforest ecological zones in Nigeria. What is majorly responsible for this variation in the use of *B. sapida* is as a result of variation that exists in the local customs and traditions of the people living in the study area. It should be noted that great variation exists in the customs and traditions of the different ethnic groups in Nigeria. Even within the same ethnic group there is intra ethnic variation in local customs and uses of plant materials for various purposes.

Policies and strategies for the utilization of B. sapida fruits

In view of the findings of this research work the following policies or strategies can help to improve the utilization of *B. sapida* among the people in the study area:

Review of State Forest Policy: It is essential that the forest policies of all the states in the study area and even all the other states in the country should be reviewed. There is the need to review the forest policy of many states in the country in view of the emerging contemporary issues in forestry that are germane to the development of forestry and the reduction of rural poverty. Presently the policy allows for people to have open access to NTFPs in free areas. Members of a community are also given free access to NTFPs on communal lands while members of the public are given free access to a limited number of NTFPs on government lands. This limited access includes free access to exploit leaves, snails, mushrooms, herbs and some fruits. This situation has not really help in the sustainable management of NTFPs on communal lands. There is therefore the need to

review state forest policy to take care of NTFP governance especially on communal lands. For instance issues that concerns NTFP governance are necessary to be addressed by the forest policy of the states in the country in order to take care of competition and over-exploitation of NTFPs. State forest policy should particularly pay attention to NTFP governance by ensuring that a unit is created in the Department of Forestry in each state that will see to all issues that is related to NTFPs especially NTFP governance. This will go a long way in helping local community dwellers to direct the utilization of NTFPs on their communal lands in a better and more sustainable manner. This no doubt will be in line with the current trend in the management of NTFPs worldwide. This will help to ensure sustainable management of NTFPs towards meeting the needs of the people.

Adoption of Open door Forest Policy: Closely related to what has been stated above is the fact that forest policy makers should adopt an open door policy on issues that are related to *B. sapida* and other NUS. This is because if the utilization of *B. sapida* and other NUS is to improve considerably among the people forest policy makers must adopt this strategy (open door policy) that will allow for easy flow of information and communication from the people to the NUS unit and forest policy makers and from NUS unit to the people. NUS unit and or forest policy makers should be able to have free flow of information on the various indigenous uses of NUS as well as uses of NUS from other countries. This will help policy makers come up with a holistic policy that will help to promote the utilization of NUS.

Commercialization of B. sapida and other NUS: Commercialization is one sure way by which the interest of the people in the utilization of *B. sapida* and other NUS can be increased. This is because commercialization will help to increase income earnings people can get from *B. sapida* and other NUS tremendously. The strategy of

commercialization can be achieved in the following ways:

- a. Existing markets of *B. sapida* and other NUS should be upgraded and expanded by the state or local government. Markets with shelter facilities should be provided for traders of *B. sapida* and other NUS both in rural markets and in urban markets. In addition new markets for NUS products should be created at strategic locations in urban centres. The strategic locations are those locations that can advertise or help boost the awareness of NUS products among urban dwellers. This will help to boost the level of patronage of NUS products and help to increase the income derived from them.
- b. Another way of improving the commercialization of *B. sapida* and other NUS is by encouraging market research on *B. sapida* and other NUS. Part of the market research will be to identify the best selling points for *B. sapida* and other NUS and the best selling method (whole selling, retailing or hawking). Market research will also provide information on the best way of linking producers of NUS products with the markets. Most importantly market research should be able to identify important roads that can be developed that will link majority of the producers of *B. sapida* and other NUS with the markets. Market research should also help to provide information on the characteristics or traits of *B. sapida* or any other NUS that is preferred by consumers so that producers/ marketers can strive towards supplying those with the desired traits.
- c. Another way of improving commercialization of *B. sapida* and other NUS products is to provide improved storage facilities to the producers and sellers of these products. Improved storage facilities will help to reduce loss through spoilage as it is currently experienced by most sellers of *B. sapida* fruits due to poor storage facilities.

Improved storage facilities will therefore help to encourage massive sales of NUS products.

- d. Value addition to *B. sapida* fruits or any other NUS products can also help to improve their commercialization. Processing of *B. sapida* fruits can help to add more value to the fruits of *B. sapida* thereby helping to increase sales and income derived from them. Taylor (1999) noted that local processing of forest fruits can increase returns value addition. Adedayo (2002) also noted that local processing of the fruits of *Parkia biglobosa* and *Vitellaria paradoxum* added more value to these fruits and brought more income through improved sales of the fruits. Another way of adding more value to the fruits of *B. sapida* is to parboil the arils in salted water or milk. It can then be fried lightly in butter. This will help to boost the sales of *B. sapida* considerably on both the domestic and export markets. Montoso Gardens (2007) noted that salted arils of *B. sapida* have become a national delicacy in Jamaica.
- e. Removing marketing barrier that prevent marketers of *B. sapida* or any other NUS product from changing from being a retailer to wholesalers can also help to improve commercialization of *B. sapida* or any other NUS products. This is because if commercialization of *B. sapida* or any NUS product is to be encouraged there must be free entry into their marketing. Ramadhani (2002) and Schreckenber *et al* (2006) noted that commercialization of forest fruits can be improved by removing marketing barriers that prevent women from changing from being a retailer to wholesaler. They noted further that unnecessary road checks and permits should be avoided. This will promote easy movement of *B. sapida* and other NUS products and it will help to promote their commercialization.

- f. Grading and packaging of *B. sapida* fruits can also help to improve their commercialization. Grading will help to remove fruits that are low in quality, while packaging will help to attract the fruits to many people. This will thus boost its commercialization.

1. **Improved Extension Services:** -The utilization of *B. sapida* and other NUS can also be improved through improved extension services. If NUS units are created in the States Forestry Departments, they will ensure that the awareness of NUS is promoted among the people through improved extension services. Improved extension services will help to create awareness among the people the various utilization possibilities of NUS both within the country and outside the country.
2. **Promoting Conservation of *B. sapida* and other NUS:** - awareness must be created by the NUS unit among the people on the need to conserve *B. sapida* and other NUS. Studies have shown that *B. sapida* can be found growing in cultivated lands around homes and along streets (NTBG, 2013, Wikipedia, 2013). It is therefore essential that the people must be sensitized to conserve and grow more of *B. sapida*.

Conclusion

This study has shown that significant variation exist in the indigenous uses of *B. sapida* among the people living in the guinea savanna and rainforest ecological zones in Nigeria. In Igbaja 14% of the respondents use the black portion of *B. sapida* fruit as fish poison, but none of the respondents in Ile-Ife and Ikere (based in rainforest ecological zone) use it as fish poison. Also in Shaki (located in guinea savanna) 22% of the respondents use *B.*

sapida fruits in the treatment of epilepsy why none of the respondents in Ile- Ife and Ikere (located in rainforest zone) use it in the treatment of epilepsy. As such there is significant association between uses of *B. sapida* and ecological zone as well between uses of *B. sapida* and economic class of respondents in the study area. The study showed that some policies or strategies can help to improve the utilization of *B. sapida* among the people in the two ecological zones and indeed the whole country. These policies or strategies include; review of state forest policy, adoption of open door forest policy, commercialization of *B. sapida* and other NUS, improved extension services and promoting conservation of *B. sapida* and other NUS.

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