



# Impacts of the Benefit Sharing Mechanism (BSM) Policy Implementation on Forest Protection and Sustainable Use of Non-timber Products at Bach Ma National Park

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**Abstract:** This study aimed to evaluate the impacts of the benefit sharing mechanism (BSM) pilot policy on sustainable use of non-timber forest products (NTFPs) and natural resources conservation in co-management forest of Bach Ma National Park. Evaluation methods were route and permanent plot survey, household interview, in-depth interview, village meeting, group discussion and workshop at commune level. Results showed that: (1) the BSM policy had brought favorable conditions for local people in sustainable use and development of the NTFPs, as well as minimised the threats to biodiversity in co-managed forest; (2) the harvest amounts of seven selected NTFPs after two years of the BSM policy implementation were higher than growth rate of every NTFP and the permitted harvest amounts of the benefit sharing plans (BSP); (3) although there was a risk of over-exploitation of the NTFPs, the annual yields in 2013 and 2014 were much lower, but more sustainable than that before the BSM implementation; (4) the forest protection status in the co-management areas was also better than before. Additionally, this study has also defined and recommended that in order to continue the BSM, it is necessary to ensure the sustainable exploitation of NTFPs, as well as implement more enforcement activities inside the co-management forest area.

**Key words:** BSM policy, co-management, non-timber forest products, Bach Ma National Park, protection and sustainable use.

## 1. Introduction

The Bach Ma National Park is one of two pilot sites to implement the benefit sharing mechanism (BSM) in management, protection and sustainable development of the special use forests which were issued by the Prime Minister in Decision No. 126/QĐ-TTg dated February 2, 2012 in Vietnam [1, 2]. Based on this decision, the Management Board of Bach Ma National Park implemented pilot BSM at seven targeted villages of Thuong Nhat commune in the Nam Dong district, Thua Thien Hue province [3, 4].

Before the implementation of benefit sharing activities, the meetings and field surveys in seven villages were conducted with participation of local people, together with the staffs of Bach Ma National

Park and the representatives of Thuong Nhat Committee to build the benefit sharing plan (BSP) and the benefit-sharing agreements (BSAs) in co-management forest area of Bach Ma National Park. Following this, the BSP was approved by Ministry of Agriculture and Rural Development (MARD) on October 2, 2012 [5, 6]. These villages would have the official rights and responsibilities to cooperate with Bach Ma National Park to protect the forest and sustainable use of the seven kinds of non-timber forest products (NTFPs), including rattans (*Daemonorops poilanei* and *D. jenkinsiana*), honey (*Apis mellifera*), lingzhi mushroom (*Ganoderma lucidum*), bamboo shoot (*Bambusa balcooa*), snail (*Bellamya chinensis*), wild boar (*Sus scrofa*) and seed of *Scarphium lychnophorum* [1, 6], in the ecological rehabilitation zone of the Bach Ma National Park. The BSM initially makes local people to see clearly their roles and

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responsibilities related to benefits and income from forest [7]. In addition, reducing tensions between the forest resource users and the stakeholders helps the Bach Ma National Park's staff to manage more effectively [8].

However, in the process of the BSM implementation in the co-management forest, negative impacts may occur, thus adversely affecting the natural resources [9, 10]. Hence, some questions need to be considered, such as what is the number of the NTFPs having the sign of over-exploitation after the BSM policy implementation? Is the number of the NTFPs going up or down? Is the number of pre-commercial and commercial rattan canes going down or up? Are the applied harvest techniques complied with the principle of sustainable forest management? And what are the impacts of the BSM on the status of forest conservation? Therefore, the study of the impact of BSM policy implementation to forest protection and sustainable use of the NTFPs in the co-management forest areas is necessary and has significant practice. In this study, the impacts of BSM implementation on sustainable use of NTFPs and natural resources conservation in co-management forest of Bach Ma National Park at Thuong Nhat commune were evaluated. The results of this study will be a good base materials for other pilot follow-up replications at the Bach Ma National Park and other protected areas in Vietnam.

## **2. Methodology**

### *2.1 Selection of Study Sites*

The co-management forest of Thuong Nhat commune has been selected to research based on the Decision No. 126/QD-TTg. Following the BSM plan approved by MARD in October 2012, seven villages, including Ta Lu, A Sach, Ta Rin, Lap, Hop Hoa, A Tin and La Van, located in the Thuong Nhat commune would have the official rights and responsibilities to cooperate with the Management Board of Bach Ma National Park to protect the forest and use sustainably

NTFPs in the park.

### *2.2 Data Collection*

The secondary data were collected mainly from Bach Ma National Park and the agencies of the commune at district levels. The secondary data include the Decision No. 126/QD-TTg, BSM, BSP, the BSAs and the Thuong Nhat Forest Ranger Station's reports.

The primary data were collected at the study sites by using the participatory rural appraisal (PRA) survey tools, such as semi-structured and structured interviews, in-depth interviews, focus group discussions, village meetings and village transect walk and workshop.

There were 72 semi-structured and structured household interviews undertaken in 2014. The closed questions were used to measure the level of impacts of the BSM policy on the NTFPs harvest status in the co-management area.

In order to assess the impacts of the BSM implementation on the forest resources in the co-management area, two methods were used, i.e., route survey and sample plot survey. Total 36 permanent sample plots were randomly marked on the map to get most representation of the different forest types before going into the forest to set up the sample plots for investigation. Then, use the GPS to identify the plot position in the forest, and mark in red color paint on the tree as a center point of the sample plot. The circular fixed area plots (400 m<sup>2</sup>) with a radius of 11.3 m were laid out to detect and measure the rattan clump, number of lingzhi mushroom (*G. lucidum*) and bamboo shoot (*B. balcooa*) as well as signs of impacts on the forest. The surveys were implemented in January 2013 and January 2014. The forest resources surveys were conducted a total of eight times in cooperation with the rangers of the Thuong Nhat Forest Protection Station and members of the seven village forest protection (VFP) teams. Each survey was done by seven people in 3 d along the designed routes and with 36 permanent sample plots designed as mentioned above.

The in-depth interviews and the group discussions was conducted with leaders of the seven villages, two local NTFPs traders, two forest rangers of the Thuong Nhat Forest Ranger Station, heads of seven village forest protection (VFP) teams and the president of Thuong Nhat People Committee. The total key informants for in-depth interviews were 19 people. Next step was to conduct seven village meetings to gain more information and cross-check main relevant issues. There were 140 participants taking part in the seven village meetings which took place in January, 2014. Final step was to organize the workshops to share the results, evaluate the BSM and get comments from related stakeholders. The workshop was held in Thuong Nhat commune in March, 2014. The workshop participants were representatives of the local authorities, including the Nam Dong District People Committee, the district agriculture department, the district forest protection department, the provincial forest protection department, Bach Ma National Park Management Board, Thuong Nhat Forest Ranger Station, the members of BSM Management Council, the monitoring group and the village forest protection teams.

### 2.3 Data Analysis

The MS Excel 2013 was used to process the data and find out the local harvest behavior and the harvest sustainability level of rattans.

The calculated results of the interview surveys were compared question by question to clarify the changes in local perceptions on relevant issues. The calculated results of permanent sample plots were compared before and after the BSM implementation.

## 3. Results and Discussion

### 3.1 Forest Resource Status in the Co-management Area

According to BSP approved by MARD in October 2012, the natural forest area of Bach Ma National Park allocated to the seven villages to co-manage is 9,219.5

ha [6]. The analysis of 36 sample plots in the co-management areas showed that distribution and dynamics of the NTFPs' volumes have a close relationship with elevation, natural forest types and forest canopy cover. The forests in co-management forest area under the BSM are classified according to six main types (Table 1): rich forest, medium forest, poor forest, rehabilitation forest, regeneration forest and shrub forest and grassland.

The results from Table 1 and Fig. 1 showed that the rich and medium forests are mainly distributed at the elevation above 500 m and there are a lot of valuable timbers, such as *Hopea*, iron wood, etc.. Two of these forest types are assessed as potential categories for exploitation of lingzhi mushroom (*G. lucidum*), seed of *S. lychnophorum* and honey (*A. mellifera*) with an area of 4,542.70 ha (49.3% of the entire area), of which 1,593.6 ha lie in evergreen forest with rich volume and 1,593.6 ha lie in evergreen forest with medium volume.

The results also indicated that the forest areas have potential for exploitation of wild rattans (*D. poilanei* and *D. jenkinsiana*) and bamboo shoot (*B. balcooa*) at the elevation below 500 m with an area of 4,662.2 ha (occupying about 50.6% of total co-managed forest), including 17.3% of poor forest, 13.1% of rehabilitation forest and 20.2% belonging to regeneration forest. These areas have potential for exploitation of snail (*B. chinensis*) that is found in the different forest types.

### 3.2 Status of NTFPs Harvest before and after Implementation of the BSM Policy

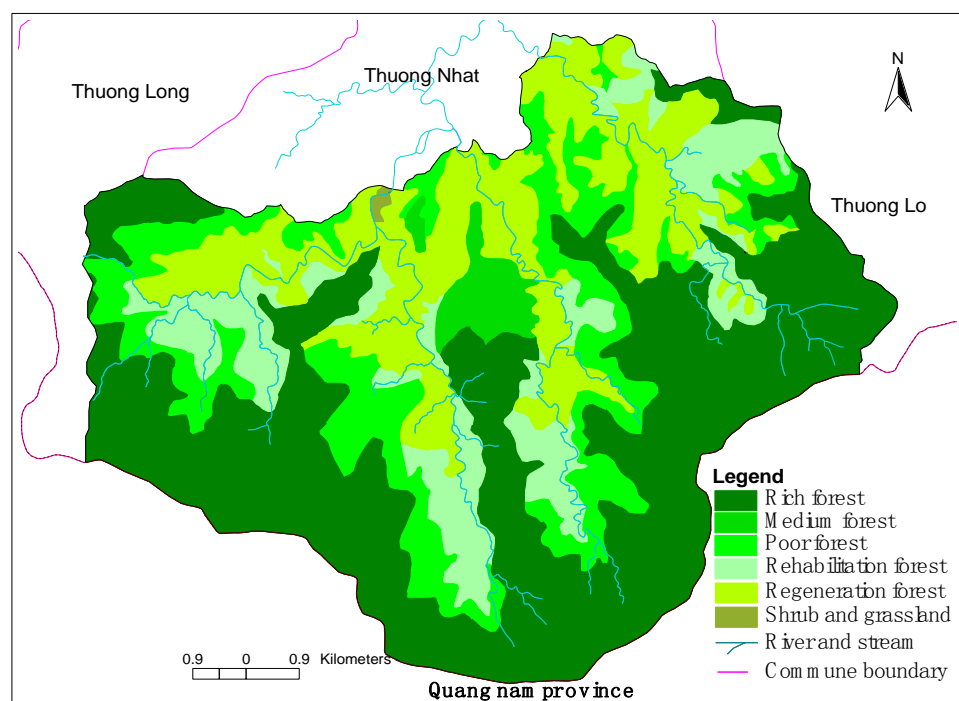
#### 3.2.1 Level of NTFPs Harvest Amounts before and after the BSM Implementation

The results from the analysis of interview and monitoring data revealed that there are three main NTFPs evaluated, i.e., rattan, honey and lingzhi mushroom. The other four NTFPs were very difficult to evaluate, as stated by the rangers, because of lack of

**Table 1** The natural forest types in the co-management areas.

No.	Natural forest types	Area		Description and regulation
		ha	%	
1	Evergreen forest with rich volume/rich forest	4,362.6	47.3	-The terrain is quite complex; this forest type distributes mainly at the elevation above 500 m above sea level; the NTFPs which are suggested as benefit sharing species are very few; this is the habitat of many animals. -Suitable for taking honey ( <i>A. mellifera</i> ) and exploiting snails ( <i>B. chinensis</i> ), lingzhi mushroom ( <i>G. lucidum</i> ) and seed of <i>S. lychnophorum</i> .
2	Evergreen forest with medium volume/medium forest	180.1	2.0	-Distributes mainly at the elevation above 500 m and the terrain is quite complex; the NTFPs of flora which are suggested as benefit sharing species are very few. -Suitable for taking honey ( <i>A. mellifera</i> ) and exploiting snail ( <i>B. chinensis</i> ), lingzhi mushroom ( <i>G. lucidum</i> ) and seed of <i>S. lychnophorum</i> .
3	Evergreen forest with poor volume/poor forest	1,593.6	17.3	- Distributes mainly in quite favorable terrain and at 200-500 m elevation. -Distributes near streams with high rattan density, but less than in regeneration and rehabilitation forest. -Exploitation of rattans ( <i>D. poilanei</i> and <i>D. jenkinsiana</i> ), lingzhi mushroom ( <i>G. lucidum</i> ) and snail ( <i>B. chinensis</i> ).
4	Rehabilitation forest	1,207.6	13.1	-Terrain is very favorable, at elevation below 200 m above sea level. -Distributed near streams, with high rattan density. -Exploitation of rattans ( <i>D. poilanei</i> and <i>D. jenkinsiana</i> ) and bamboo shoot ( <i>B. balcooa</i> ) and snail ( <i>B. chinensis</i> ).
5	Regeneration forest	1,861.0	20.2	-Terrain is also very favorable, lies near community forests. -Have the biggest amount of rattans ( <i>D. poilanei</i> and <i>D. jenkinsiana</i> ). -Exploitation of rattans ( <i>D. poilanei</i> and <i>D. jenkinsiana</i> ), bamboo shoot ( <i>B. balcooa</i> ), snail ( <i>B. chinensis</i> ) and hunt wild boar ( <i>S. scrofa</i> ).
6	Shrub forest and grassland	14.6	0.2	-Favorable terrain, at the elevation below 500 m above sea level. -There is no potential for exploitation of the NTFPs.
Total		9,219.5	100.0	

Source: BSP 2012.



**Fig. 1** Map of forest types in the co-management area.

control of the numbers of people who are involved in harvesting these products. In addition, the local people said that the BSM implementation has influenced directly exploitation of the NTFPs. For comparison, the total harvest amounts of the seven selected NTFPs before and after the BSM implementation are given in Table 2.

The statistical results in Table 2 showed that the harvest amounts of rattan and hunting numbers of wild boars in 2013 are lower than that in 2012 (before the BSM implementation) and 2014. Rattan is the main NTFPs that many households are interested in. The total harvest amounts of the wild rattan and bamboo shoot in 2013 and 2014 are much lower than that in 2012. In contrast, total harvest amount of other NTFPs are much less than that in 2012. This can be explained by the group discussions that the BSM opened more chances for the villagers to harvest the NTFPs and the stricter control by the rangers and the VFP teams has reduced the harvest amount of rattan and bamboo shoot.

### 3.2.2 Excessive Level of NTFPs Exploitation in 2013 and 2014

Based on the Decision No. 2394/QD-BNN-CLN, the BSM management council has organized local people to register and apply for the harvest permission

paper. However, the local people did not harvest the above NTFPs in November and December 2012. Hence, we could consider that the BSM plan approved by MARD was officially applied from January 2013 to December 2014.

Based on the comparison of harvest amount in 2013 and 2014 with the permitted harvest amount and estimation of annual yield (Table 2), it is clear that amounts of most of the selected products harvested in 2013 and 2014 were higher than the permitted amounts regulated by the BSP. The results indicated that the local people harvested all kinds of the permitted NTFPs as regulated in the BSP at the end of 2014. However, the seed of *S. lychnophorum* was not harvested in 2013, because the species gives many fruits only every three years, resulting in very few seeds collected by local people. In comparison with estimates of annual yield or the sustainable exploitation of the seven NTFPs, harvested amounts indicate that most of products are over-exploited. The above results confirm that there is a risk of over-exploitation of NTFPs given the estimates of 2013 and 2014. This can be attributed to the limited implementation experiences of the relevant BSM partners with the loose management and monitoring in NTFPs exploitation during the first two years of BSM

**Table 2 Harvest amount and excessive level of seven NTFPs before (2012) and after the BSM implementation (2013 and 2014).**

Species	Unit	Harvest amount in 2012	Estimation of annual yield	Permitted harvest of BSP	After BSM implementation in 2013		After BSM implementation in 2014	
					Harvest amount	Rate of harvest (%)	Harvest amount	Rate of harvest (%)
Rattans ( <i>D. poilanei</i> and <i>D. jenkinsiana</i> )	kg	203,600	136,390	91,350	139,360	102.2	168,400	123.5
Honey ( <i>A. mellifera</i> )	Bottle (0.5 L)	2,380	1,666	1,287	2,470	148.3	2,868	172.1
Lingzhi mushroom ( <i>G. lucidum</i> )	kg	700	490	400	536	109.4	873	178.2
Bamboo shoot ( <i>B. balcooa</i> )	kg	4,400	1,820	480	3,070	168.7	2,137	117.4
Snail ( <i>B. chinensis</i> )	kg	2,610	1,302	660	4,080	313.4	3,527	270.9
Seed of <i>S. lychnophorum</i>	kg	3,920	2,709	950	Na	Na	5,357	197.7
Wild boar ( <i>S. scrofa</i> )	Individual	48	46	29	71	154.3	49	106.5

Source: Surveys in 2012, 2013 and 2014; Na: not available data.

application. Besides, the BSM policy has brought to the favorable condition for local people to official use as well as un-official use of the NTFPs, resulting in much more amount of these products harvested by the local people. However, it is still a gap for more discussion that if the amounts regulated by the BSP (approved by MARD) are precise or not as a base to compare and clarify the level of over-exploitation. This issue, as stated in the workshops at commune level, is important that the annual yield of NTFPs harvest is not more than its annual growth rate. This is also one of the main challenges to scale up the BSM policy in future, because each species needs to be researched thoroughly on its growth rate and availability in each region in order to decide the harvestable amount to manage and use it in a sustainable manner.

### 3.3 Impacts of the BSM Policy on Sustainable Use of Rattan Resources under the Natural Forest Canopy in the Co-management Area

#### 3.3.1 Sustainable Yield of Rattan in the Co-management Area

As mentioned above, wild rattan is the main NTFPs that many households are interested in. The two most valuable rattan species have been harvested in the co-management areas are *D. poilanei* and *D. jenkinsiana*. In fact, the relationship between rattan stock and yield may have profound consequences for the sustainable use of rattan [11]. In addition, the growth rates determine the number of harvestable

rattan canes. The growth and yield studies were conducted on two rattan species in the co-management forest areas. The results from the analysis of sample plots after implementing BSM policy in the first two years are summarized in Table 3.

The data in Table 3 show that the numbers of pre-commercial and commercial canes have differences between 2013 and 2014. The growth of rattan species in the forest co-management areas is about 1.0 m/cane/year. Most of growth occurs in pre-commercial canes because of the large number of stems. The growth of pre-commercial and commercial canes in 2013 and 2014 was 884 m/ha/year and 1,455 m/ha/year, or 177 and 291 merchantable ( $\geq 5$  m long) canes/ha/year, or 195 kg/ha/year and 320 kg/ha/year (1 m of rattan cane equivalents to 1.1 kg), respectively. This is the amount of annual yield that can be harvested from the natural forest without diminishing the current stock of canes in the different sites of co-management areas.

#### 3.3.2 Impacts of the BSM Policy on Rattan Resources in the Co-management Area

The sustainable use of wild rattan is not only important for the natural forest ecology system, but also for sustainable forest management. If the rattan volume is reduced, not only the existence of rattan species is threatened, but the forest biodiversity is also affected. The harvest of commercial rattan canes can cause changes in rattan stock and population. Harvest levels may be more or less depending on the growth rate and the number of young canes at pre-commercial

**Table 3 Annual yield and growth rate of rattans (*D. poilanei* and *D. jenkinsiana*).**

Items	Unit	2013	2014
Number of pre-commercial and commercial canes ( $\geq 2.5$ m tall)	canes/ha	884	1,455
Annual growth rate of pre-commercial and commercial cane	m/cane/year	1.0	1.0
Number of pre-commercial canes (2.5-5.0 m tall)	canes/ha	591	966
Number of commercial canes ( $\geq 5.0$ m tall)	canes/ha	294	489
Annual growth rate of pre-commercial and commercial cane (the mean growth of <i>D. poilanei</i> and <i>D. jenkinsiana</i> ( $\geq 2.5$ m tall) is 1.0 m/cane/year)	m/ha/year	884	1,455
Annual yield of cane ( $\geq 5$ m long)	canes/ha/year	177	291
Annual yield of cane ( $\geq 5$ m long)	kg/ha/year	195	320

Source: permanent plot survey in 2013 and 2014.

or commercial canes. The data from the permanent sample plots are used to assess if before and after the BSM policy implementation, there is any change of the number of rattan canes at all size-distribution? Any change of the density of rattan? Any change of the number of pre-commercial and commercial canes? And how the regeneration level of rattan?

The results from analysis about the impacts of rattan resource exploitation before and after the BSM implementation are presented in Table 4.

The statistical results in Table 4 show that the number of cut canes in 2014 is much bigger than that in 2013. The number of harvested yield is much bigger than annual yield and growth rate of rattan. By the end of the first year of the BSM implementation (2013), there were 450 canes (> 0.7 m long)/ha removed from the co-management forest, reducing the stock from 1,622 canes/ha to 1,172 canes/ha, of which 206 canes belong to commercial canes ( $\geq 5.0$  m long), 228 canes belong to pre-commercial canes (2.5-5.0 m long) and 16 canes belong to young canes (0.7-2.5 m long). In the second year of the BSM implementation (2014), there were 719 canes/ha removed from co-management forest, reducing the stock from 2,444 canes/ha to 1,725 canes, of which 236 canes lie in commercial canes, 372

canes lie in pre-commercial canes and 111 canes lie young canes (0.7-2.5 m long). This could confirm that there is a risk of over-exploitation of rattan during the first two years of the BSM implementation, especially the second year of 2014.

According to the sustainable rattan harvest technique, at least three canes per clump must be kept in order to grow into commercial rattan and maintain the regeneration for the following years [1]. The results also indicated that the average number of canes (> 0.70 m) per clump in 2013 (4.4 canes) is higher than that of 2014 (3.14 canes). These results meet the sustainable rattan exploitation regulations by BSP implementation.

### *3.4 Impacts of the BSM Policy on the NTFPs Harvest Status in the Co-management Area*

The sustainable exploitation of NTFPs in the co-management forest area has a great potential not only to promote forest protection and biodiversity conservation, but also to enhance the livelihoods of local people. The results from the household interview survey of the 72 interviewees about the impacts of the BSM implementation on the NTFPs harvest status are summarized in Table 5.

**Table 4** Impacts of rattan exploitation before and after the BSM implementation.

Evaluation indicators	The BSM implementation in 2013			The BSM implementation 2014		
	Before	After	No. of cut canes	Before	After	No. of cut canes
No. of clump per ha	597	597	Na	550	550	Na
No. of canes (> 0.70 m) per clump	5.37	4.44	0.93	4.78	3.14	1.65
No. of canes (> 0.70 m) per ha	1,622	1,172	450	2,444	1,725	719
No. of canes (0.7-2.50 m) per ha	738	722	16	989	878	111
No. of pre-commercial canes (2.5-5.0 m) per ha	591	363	228	966	594	372
No. of commercial canes ( $\geq 5.0$ m) per ha	294	88	206	489	253	236

Source: permanent sample plot survey in 2013 and 2014.

**Table 5** Local perspectives on the NTFPs harvest status in the co-management area.

NTFPs harvest status	Agree (%)
More sustainable than before	73.6
Less sustainable than before	8.3
Not change	12.5
Do not know	5.6

Source: household interview survey in December 2014.

The results from interview data in Table 5 showed the perception of household members that NTFPs harvest status was better than before, after the first two years of the BSM implementation. If local people harvest NTFPs over the available amount, it will lead to over-exploitation. To address this, the BSM organized training courses for the NTFPs' users to increase their awareness and techniques of sustainable NTFPs harvest before applying in the field. In addition, the rangers and VFP teams have to regularly organize patrols to monitor the NTFPs exploitation. When local people asked about the sustainable NTFPs harvest in co-managed forests, 73.6% of 72 interviewees perceived it as more sustainable, while only 8.3% answered that it is less sustainable than before. This is quite relevant to the reasons mentioned above that due to the local awareness increase, resulting in more people participation in forest protection and more obligation of the harvest regulations. So, it is necessary to continue the BSM policy in next years in order to ensure the sustainable exploitation of the NTFPs inside the co-managed forests.

### *3.5 Impacts of the BSM Policy on Forest Protection in the Co-management Area*

#### **3.5.1 Threats from Consumptive Use of Natural Forest Resources before and after the BSM Policy Implementation**

Study on threats to the co-management area when

implement the BSM is necessary to identify the gaps and recommend suitable solutions to have better guidelines of policy development and implementation. The threats to the co-management area ranked as follows: (1) the high significances are seriously degrading values, (2) medium are those threats having some negative impact and (3) low are threats which are present, but not with seriously impacting values [12]. The main threats to co-managed forests before and after the BSM policy implementation are evaluated and presented in Table 6.

Comparing the threats to biodiversity in co-management areas in 2012, 2013 and 2014, the results showed that there were differences between before and after the BSM policy implementation. Most of the levels of seven main threats decreased over the first two years of the BSM policy implementation, especially in 2013. This proved that the forest protection and conservation activities are better than before. On the other hand, during two first years of the BSM implementation, the results also showed some threats in 2013 higher than in 2014. This was explained by that there were more forest patrols and monitoring works of the park rangers and the VFP teams in 2013 than in 2014. As stated by Mr. Kiem [12], the head of the Thuong Nhat Forest Protection Station, that "the year of 2014 was a shortage of the project budget funded for the co-patrolling activities, so maybe we could not control the NTFPs harvest in the forests like we did in 2013".

**Table 6 The threats to forest resources before and after the BSM policy implementation.**

No.	Threats from consumptive use of "wild" biological resources within a co-management area	Before (2012)	After	
			2013	2014
1	Hunting and killing of animals	Very high	Medium	High
2	NTFP over-harvesting	High	Low	Medium
3	Logging and wood harvesting	Very high	Medium	High
4	Fishing, killing and harvesting aquatic resources	Medium	Low	Low
5	Loss of keystone species	High	Low	Medium
6	Livestock farming and grazing	Medium	Low	Low
7	Other "edge effects" on park values	Medium	Low	Medium

Source: WWF, group discussion in December 2012, 2013 and 2014.



**Table 7 Local perspectives on the forest protection status in the co-management area.**

Forest protection status	Agree (%)	Main reasons
Better	83.3	More serious management scheme (40%), awareness increase (26.6%), more obligation of the harvest regulations (21.7%), more people participation in forest protection (8%), others (1.7%)
Moderate	5.6	Local people still do wood loggings or wildlife trappings
Worse	1.4	More NTFPs exploitation than before
Do not know	9.7	Rarely or not go to the forests

Source: household interview survey in December 2014.

This is relevant to the information mentioned in the final report of the Bach Ma National Park that there were only 20 times of co-patrols in 2014 in compared to 84 times of co-patrols in 2013. Therefore, it is necessary to secure the budget for implementing more enforcement activities by the national park rangers and the VFP teams.

#### 3.5.2 Local Perspectives on the Forest Protection Status in the Co-management Area

As mentioned above, the BSM policy implementation has encouraged local people to participate forest protection and biodiversity conservation. The results from the household interview surveys about the impacts of the BSM implementation on the forest protection status are summarized in Table 7.

The results in Table 7 showed that 83.3% of interviewees supposed that the forest protection status after two years of the BSM implementation has been improved, due to more serious management scheme (40%), local awareness increase (26.6%), more people participation in forest protection (21.7%) and more obligations of the harvest regulations (8%). On the contrary, only 5.6% of them considered no change in the status with the evidence that there were still some cases of wood loggings or wildlife trappings. About 1.4% thought that the forest protection status seemed to be worse as evidenced by more NTFPs exploitation than before.

## 4. Conclusions

The BSM policy based on the principles of co-management had brought favorable conditions for local people to access and use certain NTFPs. The

BSM initially promoted to raise the local awareness and practice on the sustainable harvest and use of NTFPs and better forest protection in the co-management areas in Bach Ma National Park. The BSM pilot policy has also created a dialogue for the management board of Bach Ma National Park and the local people to collaboratively manage the forest, reduce threats to forest resources and increase the local income through sustainable harvest of certain NTFPs in the national park.

The local people harvested all kinds of the permitted NTFPs as regulated in the BSP. Among selected NTFPs, the local people are interested in the two most valuable rattan species of *D. poilanei* and *D. jenkinsiana*. In terms of rattan harvest, the annual NTFPs harvest yield in 2013 and 2014 is much lower but more sustainable than in 2012 (before BSM implementation), the number of mature rattans still retains more than 3 canes/clump on average for the breeding rattan population in later years. These results meet the sustainable rattan exploitation regulations in BSP implementation.

From this research, it was found that when the NTFP utility right was handed over, local people harvested NTFPs in a more sustainable fashion and engaged more in the forest conservation activities of Bach Ma National Park than they did before the BSM implementation. The annual harvest amounts of NTFPs were lower than before and the forest protection status was better than before.

It is recommended that in order to continue the BSM, it is necessary to secure the annual budget for implementing more enforcement activities by the national park rangers and the VFP teams, as well as

ensure the sustainable exploitation of NTFPs and forest protection inside the co-managed forests.

## Acknowledgments

The research group would like to express sincere thanks to the Vietnam Conservation Fund (VCF) and World Wildlife Fund (WWF), especially the management board and the forest protection station staff of the Bach Ma National Park, and the local people of the Thuong Nhat commune for their active cooperation and providing the information.

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