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Yield Value Assessment and Utilization of Seasonal Flooded Forest (Pa Bung-Pa Tham) of Households in Community: Case Study in Srisaket and Ubon Ratchathani Provinces, the Lower Areas of Northeast Thailand

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Abstract: This survey research was conducted to study on the utilization and economic value assessment of forest yields from the seasonal flooded forest (Pa Bung-Pa Tham, PBPT) in lower wetland area of Mun river in Srisaket and Ubon Ratchathani provinces, Northeast Thailand. The 4 target villages were located in PBPT and they were selected by simple random sampling with 30% of the households in each village and the samples of this research were 180 households. The results were found that the studied households in village 1-4 had the utilization of PBPT as 95.6, 94.3, 100 and 98.2%, respectively and the number of the members of the households who utilized PBPT were averaged as 2.18, 2.47, 2.07 and 1.99 persons, respectively. And the studied households of 4 villages had utilization of PBPT for food sources, medicinal herb sources and income sources of the households, respectively. The important collected yields from PBPT of 4 studied villages were mushrooms, bamboo shoots, yams, wild native fruits, small animals, local native vegetables and fire woods and woods for making charcoals with the economic value assessment of forest yields in village 1-4 were 10,982.22; 11,563.29; 22,610 and 13,489.81 Baht/household/year, respectively.

Key words: Seasonal flooded forest utilization, yield value assessment, households in community, lower areas of Northeast Thailand, Mun river, economic value

INTRODUCTION

Pa Bung-Pa Tham (PBPT) was the seasonal flooded forest in the wetland of many rivers in Northeast Thailand (Isaan region). Klinhom (1996) defined the meanings of Bung and Tham as follow as: Bung was a wetland close to the rivers where it was a low basin of Tham, it might be flooded for the whole year or mostly a year liked lake or big ponds which comprised of the thick bushes in this area and Tham was the flooded plain areas of both banks of the rivers which would be flooded about 1-3 months annually (September-November) that led to collect the organic matter or silt to this temporary flooded land, so the soil in this area had high fertility and became the sources for bearing many kinds and species of living things such as aquatic and land plants, aquatic and land animals and amphibians.

Therefore, PBPT was the society of many kinds and varieties of plants in the seasonal flooded forests in both banks of many rivers and big ponds linked to the rivers. It was the society of plants in seasonal flooded areas in rainy season. The plants in PBPT mostly were ever green plants, trees, bushes, mulching plants and aquatic plants (Kunurat, 1996). PBPT was an important component that influenced on ecological system of every rivers in Isaan region and influenced on the life style of the people in Isaan community who earned their life by using the natural resources from PBPT for many years ago (Kunurat, 1996). So, it might state that PBPT was very important to ecological system, economy and life style of the people in community. Theerayanawat (1996) stated that economic value of the yields from PBPT could be divided as 3 types such agricultural yields that cultivated in PBPT areas, natural plant yields from PBPT and natural animal yields from PBPT and other yields.

And as the same aspect, Sri-Oath (2001) studied on the utilization of PBPT of the villagers in Ban Nonyang, Khaow sub-district, Selapoom district, Roi-et province and found that the villagers utilized PBPT as patterns as utilization of the areas of PBPT and utilization of yields and natural resources of PBPT which Ban Nonyang villagers would utilized PBPT as the sources of foods, usable woods in households and medicinal herbs and besides as the sources of great income of community

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which it was similar as the study of Klinhom (1996) found that PBPT was very important for earning and living conditions of the villagers in Northeast Thailand by using many kinds and varieties of plants as foods and medicinal herbs. However, a deep study for yield value assessment of PBPT that could influence on the community economy in Northeast Thailand, especially in PBPT in the lower wetland areas of Mun river in Srisaket and Ubon Ratchathani provinces were not studied yet.

Therefore, the objectives of this research were to study on the utilization and value of yields of PBPT in Srisaket and Ubon Ratchathani provinces and yield value assessment for community economy aspect for application the basic data to promote in sustainable PBPT conservation and management of these studies forests soon.

MATERIALS AND METHODS

This research was conducted to study on the utilization and economic value assessment of forest yields from the seasonal flooded forest (Pa Bung-Pa Tham, PBPT) where the communities were closed or located in PBPT in lower wetland area of Mun river in Srisaket and Ubon Ratchathani provinces, Northeast Thailand. The details of materials and methods were as follows:

Selection method of target studied communities: Because the main objective of this research was to study on the utilization of yields of PBPT of the community in lower wetland areas of Mun river in Srisaket and Ubon Ratchathani provinces, so the community which were closed to PBPT or they were located in PBPT would be selected as the target studied communities.

The method of selection was operated by questioning masters, officers who worked and related to PBPT promotion and conservation, map studying, aerial photograph and artificial satellite photograph studying including site visits in the real places before the research conduction and the results of study and selection method could select 4 communities for this research which they were Ban Daengnoi (Village 1) Nongwaeng sub-district, Kantararom district, Srisaket province, Ban Jaantanon (Village 2) Nongbor sub-district, Muang district, Ubon Ratchathani province, Ban Hong-or (Village 3) Thachang sub-district, Sawangweerawong district, Ubon Ratchathani province and Ban Pakbung (Village 4) Khanrai sub-district, Sirindhorn district, Ubon Ratchathani province.

Samples of the research: The samples of this research were the households of 4 selected communities which they were selected by simple random sampling with at least 30% of households of the whole number of households in each community, so the number of household samples were 185 samples (45, 70, 15 and 55 household samples in village 1-4, respectively).

Data collection and analysis: The data collection from the household samples was conducted by using questionnaires and enquiring the representatives of the household samples of each studied community. The collected data were analyzed by using package program of SPSS for Windows Version 11.5 and the used statistics was a descriptive statistic such as percentage, mean, standard deviation and economic value assessment of the yields from the studied PBPT.

RESULTS AND DISCUSSION

General basic data collection from the questionnaire respondent samples

Ban Daengnoi (Village 1): The questionnaire respondent samples of Ban Daengnoi were mostly female (64.4%) with average age of 53.89 years old, main occupation was rice planting farmers (97.8%) and over one half of respondent samples (55.6%) had additional occupations such as vegetable gardening, forest yield collection (2.2%). The social status of the respondent samples was mostly ordinary villagers (88.9%) of the village people and the average income was 37,888.89 Baht year^{-1}. The respondent samples (91.1%) were living in the village, since they were born and mostly of them (86.7%) never attend any training courses or meetings concerning with forest conservation and management. The distance of the residence of the respondent samples to PBPT was about 1.52 km.

Ban Jaantanon (Village 2): The questionnaire respondent samples of Ban Jaantanon were mostly female (54.3%) with average age of 54.11 years old, main occupation was rice planting farmers (97.8%) and over one half of respondent samples (62.9%) had additional occupations such as general hirelings. The social status of the respondent samples was mostly ordinary villagers (70.0%) of the village people and village executive committee (21.4%). Their average income was 36,557.14 Baht year^{-1}. The respondent samples (97.1%) were living in the village, since they were born and mostly of them (72.9%) never attend any training courses or meetings concerning with forest conservation and management. The distance of the residence of the respondent samples to PBPT was about 2.30 km.

Ban Hong-or (Village 3): The questionnaire respondent samples of Ban Hong or were mostly male (73.3%) with average age of 53.67 years old main occupation was rice planting farmers (93.3%) and most of respondent samples

had additional occupations such as forest yield collection (66.7%) and hirelings (20.0%). The social status of the respondent samples was mostly ordinary villagers (86.7%) of the village people and the average income was 31,333.33 Baht year^{-1}. The respondent samples (73.3%) were living in the village since, they were born and mostly of them (80.0%) ever attended training courses or meetings concerning with forest conservation and management. The distance of the residence of the respondent samples to PBPT was about 2.07 km.

Ban Pakbung (Village 4): The questionnaire respondent samples of Ban Pakbung were mostly female (74.5%) with average age of 53.29 years old, main occupation was rice planting farmers (100%) and most of respondent samples (30.9%) had additional occupations such as commerce, vegetable gardening and hirelings with 25.5 and 16.4%, respectively. The social status of the respondent samples was mostly ordinary villagers (92.7%) of the village people and the average income was 34,454.55 Baht year^{-1}. The respondent samples (98.2%) were living in the village, since they were born and mostly of them (74.5%) ever attended training courses or meetings concerning with forest conservation and management. The distance of the residence of the respondent samples to PBPT was about 0.83 km.

Point of views related to PBPT and the utilization of PBPT of the respondent samples: The point of views of the respondent samples concerning with the relationship of PBPT and living conditions were found that Ban Daengnoi, Ban Jaantanon, Ban Hong or and Ban Pakbung were 97.8, 94.3, 93.3 and 100% of the relationship of PBPT and their living conditions, respectively. The point of views of the respondent samples concerning with the utilization of PBPT were found that 95.6, 94.3, 100 and 95.6% of them usually utilized PBPT and the number of household members who utilized PBPT were 2.18, 2.47, 2.07 and 1.99 persons, respectively. The patterns of PBPT utilizations of 4 villages were found similarly that PBPT was utilized mostly as the source of foods, the respondent samples (>60.0%) in Ban Daengnoi, Ban Jaantanon and Ban Hong-or utilized PBPT as the source of medicinal herbs and the respondent samples of Ban Daengnoi, Ban Jaantanon, Ban Hong-or and Ban Pakbung with 75.7, 31.4, 53.3 and 18.2% of them, respectively utilized PBPT and the source of income of households (Table 1). This study indicated that the households in the community had the relationship with PBPT and it might state that the community in PBPT would earn their life by utilizing PBPT as the sources of foods, medicinal herbs and economy of the community which was related similarly to the reports of Kunurat (1996), Sri-Oath (2001) and Klinhom (1996).

Yield collection from PBPT of the studied communities: From the study found that the respondent samples of 4 villages collected the yield from PBPT such as mushrooms, vegetables, wild native fruits, bamboo shoots, yams, insects and small animals. There were 3 villages (Ban Jaantanon, Ban Hong-or and Ban Pakbung) collected fire woods and woods for making charcoals from PBPT. And there were only 2 villages (Ban Jaantanon and Ban Pakbung) collected vetiver grass and hardy woods from PBPT.

When the consideration of main yields collection from PBPT found that Ban Daengnoi respondent samples mostly collected mushroom (77.77%) and following by collection of vegetables (66.66%), yams (62.22%) and wild native fruits (62.22%), respectively. Ban Jaantanon respondent samples mostly collected mushroom (94.3%)

Table 1: Point of views and utilization of Pa Bung-Pa Tham (PBPT) of the respondent samples

	Studied villages			
Items	I (n = 45)	II (n = 70)	III (n = 15)	IV (n = 55)
Relationship of PBPT for earning and living conditions (%)				
No relationship	2.2	5.7	6.7	0.0
Positive relationship	97.8	94.3	93.3	100.0
Utilization of PBPT of members in household (%)				
No utilization	4.4	5.7	0.0	1.8
Utilization	95.6	94.3	100.0	98.2
Number of members who utilized PBPT* (person, mean±SD)	2.18±0.78	2.47±1.06	2.07±0.59	1.99±0.91
Patterns of utilization (%)**				
Foods	95.6	94.3	100.0	98.2
Residence or tools	22.2	32.9	20.0	34.5
Cloths or dress	11.1	2.9	13.3	0.0
Medicinal herbs	60.0	68.6	66.7	0.0
Incomes	75.7	31.4	53.3	18.2

*Calculated from the utilized household; **The answers were >1 and calculated from the utilized household; I = Ban Daengnoi (Village 1) Nongwaeng sub-district, Kantararom district, Srisaket province; II = Ban Jaantanon (Village 2), Nongbor sub-district, Muang district, Ubon Ratchathani province; III = Ban Hong-or (Village 3), Thachang sub-district, Sawangweerawong district, Ubon Ratchathani province; IV = Ban Pakbung (Village 4), Khanrai sub-district, Sirindhorn district, Ubon Ratchathani province

and following by collection of vegetables (77.14%) wild native fruits (67.14%) and yams (62.86%), respectively. Ban Hong or respondent samples mostly collected bamboo shoots (100%) and following by collection of mushrooms (93.33%), wild native fruits (93.33%), small animals (93.33%), yams (86.66%) and vegetables (80.0%), respectively. And Ban Pakbung respondent samples mostly collected mushroom (94.54%) and following by collection of vegetables (80.0%), yams (69.09%), small animals (67.27%) and fire woods and woods for making charcoals (54.55%), respectively (Table 2).

From the study of this research could concluded that the important yields of PBPT were mushrooms, bamboo shoots, yams, wild native fruits, small animals and fire woods and woods for making charcoals which related similarly with the reports of Srisin-Urai (1999) and Boonwan (2006).

Table 2: Numbers and percentages of kinds of yields that collected from PBPT according to respondent samples

Kinds of yields from PBPT	Households in the studied villages			
	I (n = 45)	II (n = 70)	III (n =15)	IV (n = 55)
Mushrooms	35 (77.77)	66 (94.28)	14 (93.33)	52 (94.54)
Vegetables	30 (66.66)	54 (77.14)	12 (80.00)	44 (80.00)
Wild native fruits	28 (62.22)	47 (67.14)	14 (93.33)	27 (49.09)
Bamboo shoots	10 (22.22)	19 (27.14)	15 (100.00)	29 (52.72)
Yams	28 (62.22)	44 (62.86)	13 (86.66)	38 (69.09)
Insects	2 (4.44)	31 (44.29)	2 (13.33)	7 (12.72)
Small animals	21 (46.66)	25 (35.71)	14 (93.33)	37 (67.27)
Vetiver grass	-	1 (1.43)	-	13 (23.63)
Hardy woods	-	2 (2.86)	-	2 (3.63)
Fire woods and woods for making charcoals	-	8 (11.43)	2 (13.33)	30 (54.55)

The number in parenthesis means the percentage; I = Ban Daengnoi (Village 1), Nongwaeng sub-district, Kantararom district, Srisaket province; II = Ban Jaantanon (Village 2), Nongbor sub-district, Muang district, Ubon Ratchathani province; III = Ban Hong-or (Village 3), Thachang sub-district, Sawangweerawong district, Ubon Ratchathani province; IV = Ban Pakbung (Village 4), Khanrai sub-district, Sirindhorn district, Ubon Ratchathani province

The quantity and economic values of the yields of PBPT from the studied communities

Ban Daengnoi (Village 1): The quantity and economic values of the yields of PBPT from Ban Daengnoi found that the respondent samples had collected the yields of PBPT about 11,555 kg year^{-1} their values were totally 494,200 Baht year^{-1} (currency exchange rate was 1 USD = 31 Baht) and an average economic values per household was 10,982.22 Baht year^{-1}. The quantity of the most collected yields were yams, wild native fruits, mushroom, bamboo shoots and small animals as the weights of 5,250, 2,520, 1,715, 1,000 and 735 kg year^{-1}, respectively. While the economic values of yams, mushrooms, small animal, wild native fruits and bamboo shoots were 262,500, 137,200, 51,450, 25,200 and 10,000 Baht year^{-1}, respectively (Table 3) which yams showed the highest economic value as 262,500 Baht year^{-1}.

Ban Jaantanon (Village 2): The quantity and economic values of the yields of PBPT from Ban Jaantanon found that the respondent samples had collected the yields of PBPT about 23,064 kg year^{-1}, their values were totally 809,430 Baht year^{-1} and an average economic value per household was 11,563.29 Baht year^{-1}. The quantity of the most collected yields were yams, wild native fruits, mushroom, bamboo shoots and small animals as the weights of 5,720, 4,465, 3,417, 2,740 and 1,250 kg year^{-1}, respectively.

While the economic values of yams, mushrooms, small animals, insect and wild native fruits were 286,000, 273,360, 87,500, 62,000 and 44,650 Baht year^{-1}, respectively (Table 4) which yams showed the highest economic value as 286,000 Baht year^{-1}.

Ban Hong-or (Village 3): The quantity and economic values of the yields of Hong-or PBPT from Ban Hong-or found that the respondent samples had collected the

Table 3: Total quantities of yields from PBPT, total economic values and average yield value per household of the respondent samples in Ban Daengnoi (Village 1), Nongwaeng sub-district, Kantararom district, Srisaket province (n = 45)

Kinds of yields from PBPT	Total quantities of yields (kg)	Average price[1] (Baht)[2]	Total economic values (Baht)	Average yield value per household[3] (Baht)
Mushrooms	1,715	80	137,200	3,048.89
Vegetables	285	10	2,850	63.33
Wild native fruits	2,520	10	25,200	560.00
Bamboo shoots	1,000	10	10,000	222.22
Yams	5,250	50	262,500	5,833.33
Insects	50	100	5,000	111.11
Small animals	735	70	51,450	1143.33
Vetiver grass	-	10	-	0.00
Fire woods and woods for making charcoals	-	5	-	0.00
Total	11,555	-	494,200	10,982.22

[1]Average price per kilogram in local markets as the data from respondent samples; [2]Currency exchange rate was 1 USD = 31 Baht; [3]Average yield value per household of all samples

Table 4: Total quantities of yields from PBPT, total economic values and average yield value per household of the respondent samples in Ban Jaantanon (Village 2) Nongbor sub-district, Muang district, Ubon Ratchathani province (n = 70)

Kinds of yields from PBPT	Total quantities of yields (kg)	Average price[1] (Baht)[2]	Total economic values (Baht)	Average yield value per household[3] (Baht)
Mushrooms	3,417	80	273,360	3,905.14
Vegetables	702	10	7,020	100.29
Wild native fruits	4,465	10	44,650	637.86
Bamboo shoots	2,740	10	27,400	391.43
Yams	5,720	50	286,000	4,085.71
Insects	620	100	62,000	885.71
Small animals	1,250	70	87,500	1250.00
Vetiver grass	150	10	1,500	21.43
Fire woods and woods for making charcoals	4,000	5	20,000	285.71
Total	23,064	-	809,430	11,563.29

Table 5: Total quantities of yields from PBPT, total economic values and average yield value per household of the respondent samples in Ban Hong-or (Village 3) Thachang sub-district, Sawangweerawong district, Ubon Ratchathani province (n = 15)

Kinds of yields from PBPT	Total quantities of yields (kg)	Average price[1] (Baht)[2]	Total economic values (Baht)	Average yield value per household[3] (Baht)
Mushrooms	770	80	61,600	4,107
Vegetables	180	10	1,800	120
Wild native fruits	1,350	10	13,500	900
Bamboo shoots	19,857	10	198,570	13,238
Yams	468	50	23,400	1,560
Insects	-	100	-	-
Small animals	504	70	35,280	2,352
Vetiver grass	-	10	-	-
Fire woods and woods for making charcoals	1,000	5	5,000	333
Total	24,129	-	339,150	22,610

Table 6: Total quantities of yields from PBPT, total economic values and average yield value per household of the respondent samples in Ban Pakbung (Village 4), Khanrai sub-district, Sirindhorn district, Ubon Ratchathani province (n = 55)

Kinds of yields	Total quantities of yields (kg)	Average price[1] (Baht)[2]	Total economic values (Baht)	Average yield value per household[3] (Baht)
Mushrooms	5,120	80	409,600	7,447.27
Vegetables	484	10	4,840	88.00
Wild native fruits	2,430	10	24,300	441.82
Bamboo shoots	3,450	10	34,500	627.27
Yams	1,420	50	71,000	1,290.91
Insects	252	100	25,200	458.18
Small animals	1,480	70	103,600	1,883.64
Vetiver grass	390	10	3,900	70.91
Fire woods and woods for making charcoals	13,000	5	65,000	1,181.82
Total	28,026	-	741,940	13,489.81

[1]Average price per kilogram in local markets as the data from respondent samples; [2]Currency exchange rate was 1 USD = 31 Baht; [3]Average yield value per household of all samples

yields of PBPT about 24,129 kg year^{-1}, their values were totally 339,150 Baht year^{-1} and an average economic value per household was 22,610 Baht year^{-1}. The quantity of the most collected yields were bamboo shoots, wild native fruits, fire woods and wood for making charcoals, mushroom and small animals as the weights of 19,857, 1,350, 1,000, 770 and 504 kg year^{-1}, respectively. While the economic values of bamboo shoots, mushrooms, small animals, yams and wild native fruits were 198,570; 61,600; 35,280; 23,400 and 13,500 Baht year^{-1}, respectively (Table 5) which bamboo shoots showed the highest economic value as 198,570 Baht year^{-1}.

Ban Pakbung (Village 4): The quantity and economic values of the yields of PBPT from Ban Pakbung found that the respondent samples had collected the yields of PBPT about 28,026 kg year^{-1}, their values were totally 741,940 Baht year^{-1} and an average economic value per household was 13,489.81 Baht year^{-1}.

The quantity of the most collected yields were fire woods and wood for making charcoals, mushroom, bamboo shoots, wild native fruits, small animals and yams as the weights of 13,000; 5,120; 3,450; 2,430; 1,480 and 1,420 kg year^{-1}, respectively. While the economic values of mushrooms, small animals, yams, fire woods and woods for making charcoals, bamboo shoots, insects and wild native fruits were 409,600; 103,600; 71,000; 65,000; 34,500; 25,200 and 24,300 Baht year^{-1}, respectively (Table 6) which mushrooms showed the highest economic value as 409,600 Baht year^{-1}.

From the economic value assessment of the yields of PBPT in this research found that an average economic value per household of Ban Daengnoi, Ban Jaantanon, Ban Hong-or and Ban Pakbung) were 10,982.22; 11,563.29; 22,610 and 13,489.81 Baht/household/year, respectively which were lower than the report of Theerayanawat (1996) stated that the economic value assessment of the resources in PBPT in the middle wetland areas of Mun river found that an average economic value per household was 38,906 Baht household^{-1} but the economic value was included the values of agricultural yields in PBPT areas and values of natural resources of PBPT (plants and animals).

So, it was different from this current research and the average economic value per household were lower because this research calculated on the natural resource values of PBPT only. Besides, the size of areas and fertility of PBPT could indicate the abundance of natural resources and their values too. Currently, PBPT was invaded for investing in the economic business such as eucalyptus planting land, agricultural land, sand suction and factory, road construction, water reservoir construction and etc. These activities caused to decrease the land and fertility of PBPT of local community (Nontnapha, 2002). Due to the occurrence of land size and fertility of PBPT were decreased that led to decrease the natural resources and yields which responded directly to reduce the average economic value per household of the community too.

CONCLUSION

This research could indicate the important roles of PBPT as the sources of foods, economy and medicinal herbs for households in the local community where PBPT were located. The important yields from PBPT were mushrooms, bamboo shoots, yams, wild native fruits, small animals, fire woods and woods for making charcoals including the special roles of PBPT to stimulate the community economy because of the yields from PBPT had economic value >10,000 Baht/household/year. Therefore, the application of an appropriate conservation and management of PBPT could make a renewal of PBPT fertility or increment of PBPT fertility, so that would influence on the abundant sources of foods and incomes of the households in local community of PBPT directly.

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