

# Willingness-To-Pay on the Conservation of Nipa palm Ecosystem of Local Residents in Lingayen, Pangasinan

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**Abstract** - The Nipa palm ecosystem is regarded as a valuable resource that has numerous values and need to be considered and integrated in any development process. This research paper was conducted to determine the willingness to pay of the local residents to conserve Nipa palm ecosystem in selected barangays in Lingayen, Pangasinan. A willingness to pay technique was employed as an important concept in the contingent valuation method (CVM) for evaluating the non-use value for the existing benefits of Nipa palm. This technique employed personal interview with guided questions to ask about individual's willingness to pay (WTP) particularly on the conservation of the existence values of Nipa palm resource. Most of the respondents were able to realize their primary role in conserving and protecting their Nipa palm ecosystem. The amount willing to pay was mostly suggested by the respondents depending on their capacity to share minimal amount primarily for keeping Nipa palm resource in their respective barangay. They had learned that Nipa palm ecosystem is a valuable resource offered various benefits and services in terms of social, economic and environment aspects, in particular. There is a need for the conduct of trainings, seminars and workshop to upgrade their knowledge and skills in maintaining ecological stability and the local residents should also be encouraged to be more aware on the immediate and long-term benefits of the Nipa palm ecosystem.

**Key words:** Conservation, *Nypa fruticans*, Nipa palm resource, Willingness-to-pay

## INTRODUCTION

Nipa palm (*Nypa fruticans*) is the only palm known to be as an associated mangrove species and is believed to be one of the oldest and previously most extensive palms of the world [1]. Among the 35 known species of mangroves found in the Philippines, the Nipa palm (*Nypa fruticans*) thrives naturally in soft mud and in calmer waters such as rivers or even in coastal areas with brackish water environment. It is the only palm that is sometimes classified as a mangrove species [2] but not considered as true mangrove [3].

Several scholars claimed that *Nypa fruticans* is a non-exclusive mangrove species due to its poor capability of toleration in long term saline water inundation [4]. Nipa has a trunk

similar to the coconut where both belong to the family of Palmae. Its stem grows primarily under the mud and its trunk can only be seen when it grows tall while its leaves or fronds and flower stalk grow straight out of the ground and can approximately extend up to 9 m (30 ft.) in height. It is likewise known to be as one of the important mangrove associates mostly used by humans for several purposes. This provides a major source of livelihood to most local residents in coastal areas where all its parts can have numerous economic benefits [5]. Nipa palm has also the ability to tolerate harsh conditions of salinity though it does not need saline conditions at all, but it can thrive in pure freshwaters as well [6]. In addition, it can also stand intermittent inundation. Nipa palm as the most versatile and useful plant in the mangrove forest where it has high potential for both economic and ecological importance, its use

and non-use values should be considered as an alternative measure to solve environmental problems in coastal communities.

This research paper was conducted to determine the willingness to pay to conserve Nipa palm ecosystem among the local residents in selected communities in Lingayen, Pangasinan. Specifically, it aimed to present all the benefits and services obtained from Nipa palm; determine the amount to pay by the respondents; and describe the willingness to pay in protecting Nipa palm ecosystem.

## MATERIALS AND METHODS

### Study Area

This research study was conducted in selected barangays in the town of Lingayen, Pangasinan namely: Barangay Balococ and Barangay Bantayan. Barangay Balococ is a small community with a total land area of 316.02 hectares while Barangay Bantayan is also rural community surrounded with waters with a total land area of 165.53 hectares. Their primary source of livelihood was both engaged in the processing of vinegar, wine and shingles from Nipa palm.

### Research Design

The researcher used a qualitative research method with a grounded theory through a personal interview with guide questions to obtain information on the amount for the willing to pay by the respondents to protect the benefits and services of Nipa palm as well as its whole ecosystem.

### Respondents of the study

The respondents of the study were the households in each selected rural communities who were involved in the conservation of Nipa palm as a valuable resource. They served as the primary source of data on the present management on the utilization of Nipa and subjected also to a face-to-face interview to share their knowledge and understanding in terms of the benefits provided by Nipa palm as well as the importance, existence and distribution of Nipa palm in their area. The stratified random sampling where fifteen percent (15%) sampling size using a random number generator in each selected barangays was used in the study. The list of households in each of the study areas was obtained from the barangay secretary through the approval of the barangay chairman. The total number of households of each selected study areas was divided based on their *purok* or area in the barangay as shown in Table 1.

Table 1. Total household number and respondents of the study.

Barangay		Total No. of Households	Total No. of Respondents
Balococ	Riverside	121	18
	Center	105	16
	East	110	17
	West	145	21
	Total	481	72
Bantayan	Zone 1	90	14
	Zone 2	85	12
	Zone 3	88	13
	Total	263	39
		Total Respondents	111

In each area or *purok*, the sample items of 15% sample size were drawn randomly. In Bantayan, the total number of households is 263 and its total sample size is 39 households while the total number of households in Balococ is 481 and its total sample size is 72 households. These 111 samples represented the subjects of the research study.

**Data Gathering Procedure**

A willingness to pay technique was employed in the study which was regarded as an important concept in the contingent valuation method (CVM) for evaluating the non-use value for the existing benefits of Nipa palm. This technique employs surveys or questionnaire to ask about individual’s willingness to pay (WTP) for environmental improvements based on hypothetical market situations [7] or to inquire about individual’s willingness to accept to any ecosystem loss or degradation [8].

In this research study, this approach was used to measure the willingness to pay of the respondents to conserve Nipa palm in their respective community. By describing all the benefits and services obtained from Nipa palm, most of the respondents were able to realize their primary role in conserving and protecting their Nipa palm. The amount willing to pay was mostly suggested by the respondents depending on their capacity to share minimal amount primarily for keeping Nipa palm in their barangay. Similarly,

the amount that could be generated will be kept and handled by the Barangay Council to ensure sustainable conservation and management of existing Nipa palm ecosystem in their respective barangays.

**Analysis**

The data gathered were tallied, listed, and summarized, and applied descriptive analysis was also employed in the presentation of the information gathered.

**RESULTS AND DISCUSSION**

**Benefits and Services of Nipa Palm Ecosystem**

The benefits and services derived from Nipa palm ecosystem were initially presented to the respondents to provide them information on the vast services that can be obtained from the Nipa palm ecosystem. In this research, the benefits, goods and services of Nipa palm ecosystem were based on the four (4) main categories, namely: Provisioning, Regulating, Supporting, and Cultural Services

**Amount Willing to Pay by the Respondents**

Table 2 presents the total and average amount willing to pay by each barangay.

Table 2. Amount willing to pay by the respondents.

Amount willing to pay	WTP (PhP/Year)				Total Amount (PhP/Year)	Average Amount (PhP/Year)
	Brgy. Balococ	f	Brgy. Bantayan	f		
P 50.00	450	9	300	6	750	375
P 60.00	1,380	23	480	8	1,860	930
P 70.00	210	3	350	5	560	280
P 80.00	1,040	13	240	3	1,280	640
P 90.00	1,350	15	1,170	13	2,520	1,260
P 100.00	900	9	400	3	1,300	650
Total	5,330.00	72	2,940.00	39	8,270.00	4,135.00

When respondents were asked how much they were willing to pay as conservation fee to keep and protect Nipa palm ecosystem, the Barangay Balococ has 23 respondents that were willing to pay an amount of P 60.00 every individual, 15 were willing to pay P 90.00 each, 13 were willing to pay P 80.00 each, 9 were willing to pay P 100.00, another 9 were willing to pay P 50.00, and only 3 respondents were willing to pay amounting to P 70.00 with a total amount of P1,380, P1,350, P1,040, P900, P450 and P210, respectively. The total amount of the WTP of Barangay Balococ had earned a total of P5,330.00. Results show that there were more respondents who were willing to pay an amount of P 60.00 each for the conservation of Nipa palm in their area. Since Barangay Balococ was composed of 481 households, and then it would generate an amount intended for the conservation of Nipa palm ecosystem in the barangay with a total of:

$$481 \text{ households} \times \text{P } 60.00/\text{year} = \text{P } 28,860.00$$

In Barangay Bantayan, 13 respondents were willing to pay an amount of P 90.00 each, 8 were willing to pay P 60.00 each, 6 were willing to pay P 50.00 each, 5 willing to pay P 70.00 each, 4 willing to pay P 100.00 each, and 3 respondents were willing to pay an amount of P 80.00 each with a total amount of P1,170, P480, P400, P350, P300, and P240, respectively. The total amount

of the WTP of Barangay Bantayan was P2,940.00. The result shows that the highest amount the respondents were willing to pay for the conservation of Nipa palm ecosystem was P 90.00 each. Barangay Bantayan was composed of 263 households when multiplied with the highest amount of P 90.00, it would generate a total of:

$$263 \text{ households} \times \text{P } 90.00/\text{year} = \text{P } 23,670.00$$

### Willingness-to-pay (WTP) to Conserve and Protect Nipa Palm Ecosystem

Figure 1 also illustrates the values exhibiting the total amount of the willingness to pay by the respondents and the corresponding average amount per year. This was categorized according to the lowest and highest amount such as P 50.00, P 60.00, P 70.00, P 80.00, P 90.00 and P 100.00.

Result shows that the said total amount that respondents were willing to pay was intended to ensure the Nipa palm ecosystem are not sacrificed nor lost to any development project. It should be conserved for future generations.

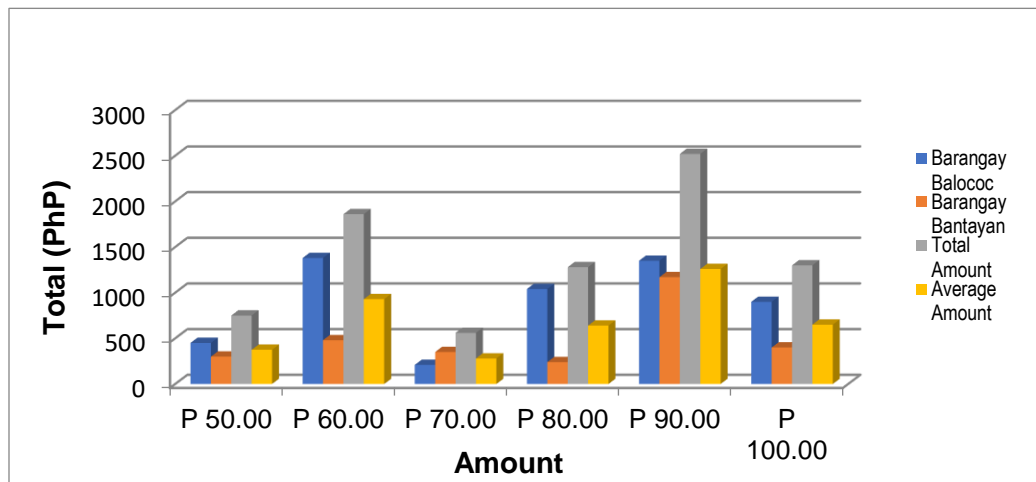


Figure 1. Amount willing-to-pay by the respondents.

All the respondents in the study areas were willing and agreed to keep Nipa palm in their barangay because they knew that Nipa palm ecosystem offered various benefits and services particularly to local community members. The highest sources that it can provide were for source of income, employment opportunities, food and local medicines production, and house thatching materials. It also has a high potential for ecological importance such as prevention and protection against natural disasters and can also offer nursery areas for fingerlings and shelter for bivalves, crustaceans and molluscs.

#### CONCLUSION AND RECOMMENDATION

Respondents were willing and agreed to conserve and protect the Nipa palm ecosystem in their respective barangay because of the various benefits and services offered by Nipa palm ecosystem in terms of social, economic and environment aspects, in particular. There is a need for trainings, seminars and workshop to be conducted to upgrade the knowledge and skills in maintaining ecological stability and the local residents should also be encouraged to be more aware on the immediate and long-term benefits of the Nipa palm ecosystem.

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