Willingness to pay for ecolabelled products: the case of traditional rice varieties in the Philippines

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How to cite this paper: Balgos, C., Digal, L.. (2019) Willingness to pay for ecolabelled products: the case of traditional rice varieties in the Philippines. *International Journal of Food Science and Agriculture*, 3(3), 205-219.

DOI: 10.26855/ijfsa.2019.09.010

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Abstract

Philippines is one of the megadiverse countries in the world and home to globally important agricultural biodiversity particularly in rice. However, the diversity is eroded as some traditional rice varieties are no longer produced. Some farmers, however, do not continue to plant traditional varieties of rice because they are not profitable. While there is an opportunity to continue producing them as consumers begin to recognize the importance of preserving traditional varieties, it is uncertain whether this opportunity translates to better incentives for farmers. A survey of 230 consumers in Luzon, Visayas and Mindanao was done to examine this opportunity particularly the demand and willingness to pay for ecolabelled products from these traditional varieties. Factors that affect the level of price premium were also analyzed using interval regression analysis. Results show that most consumers are willing to pay for a premium although they vary depending on the level of price premium. Certification fetches higher price and majority of the respondents are willing to pay price premium for ecolabelled products that range from 10% to 20%. Results show that gender, age, income and being an organic product consumer significantly affect the level of price premium particularly the demand and willingness to pay for ecolabelled products from these traditional varieties. Factors that affect the level of price premium were also analyzed using interval regression analysis. Results show that most consumers are willing to pay for a premium although they vary depending on the level of price premium. Certification fetches higher and majority of the respondents are willing to pay price premium for ecolabelled products that from 10% to 20%. Results show that gender, age, income and being an organic product consumer significantly affect the level of price premium.

Keywords

ecolabelled products; Philippines; price premium

1. Introduction

Philippines is one of the megadiverse countries in the world and considered to be a biodiversity hotspot. It is home to diverse species of plants, animals and microorganisms where more than half are found only in the Philippines. It is also home to globally important agricultural biodiversity such as in rice and rootcrops.

One way to preserve biodiversity in agriculture or agro-biodiversity is to provide opportunity for the farming community to derive sufficient economic benefits from conserving these traditional varieties such as rice. However, a key constraint to this opportunity is the dearth of information and awareness of consumers about the social, economic, nutritional and ecological value of traditional varieties. Previous studies show a potential for organic products such as traditional varieties of rice with annual industry growth rates of 10-20% and a price premium that ranges from 20-30% (Concepcion, et al 2008) [1].

There are a number of products that are branded or labeled as environment friendly to respond to opportunities created by the awareness and value consumers place in preserving the environment. These products are generally known as ecolabelled products.

This paper attempts to examine the market potential for ecolabelled products particularly the traditional rice varieties in the Philippines. The paper is organized as follows. Section 2.0 presents some previous studies followed by section 3.0 which covers the discussion on the methodology used in the analysis. Section 4.0 provides an overview of the market for traditional rice in the Philippines while section 5.0 contains the analysis of market potential of traditional or indigenous varieties. Finally, summary and conclusions are discussed in Section 6.0.

2. Previous studies

There a number of studies that have explored the willingness to pay for environmental products and attributes (eg Aoki, et al, 2016; Lozano et al 2010; Rex and Baumann 2006). Of these, some focused on organic products such as Sriwaranun, et al (2015) in Thailand, Sirieix, et al (2011) in China and Kuo et al (2005) in Taiwan. There were also studies specific to rice that include Kajale and Baker (2015) in India, Flamohe et al (2015) in Togo and Ara (2003) in the Philippines. The latter analyzed the multiple attributes of organic rice in Manila and Naga City while this study covered more areas and types of rice including brands and labels.

A useful framework that illustrates the value of market-based mechanism such as ecolabelling is the one by Treves and Jones (2009). According to this framework, a trade-off exists between increasing consumer confidence through verification and the willingness of producers to participate because of the costs of verification. Consumer confidence increases while producer incentive decreases as the effort of verification increases as shown in the framework they developed in **Figure 1** as applied to wildlife conservation.

Source: Treves and Jones (2009)

Figure 1.

In this framework, they also came up with three classifications of ecolabels based on the effort of verification namely, supportive, persuasive and protective ecolabels. Supportive ecolabels have lower degree of verification. Persuasive ecolabels are those that certify the methods of production but not conservation itself as done in protective ecolabels. They classified ecolabels based on these three categories.

They further argued that there is a tradeoff between increasing confidence of consumers through higher effort of verification and providing incentives to producers. This is due to the fact that increasing effort of verification increases cost which lowers incentives for producers and may put pressure to certifiers to relax the standards. Moreover, they also raised the issue that profits may not be a realistic goal for ecolabels that have higher effort of verification such as persuasive and protective ecolabels. As such, while market-based mechanism can help protect the environment, the state in most cases is in a better position to provide this public good [2].

A study by Amstel, et al., (2007) was done to examine to what extent ecolabels in the Netherlands contain standards that promote conservation and sustainable use of agro-biodiversity particularly on-farm biodiversity of agricultural landscapes. They found that the ecolabels contain some standards that promote agro-biodiversity but the differences

across labels varied extensively. They concluded that the five ecolabels they examined were insufficient for the Dutch government to use as part of a governance strategy to promote agro-biodiversity.

There were a number of issues that were identified in using ecolabels. A study by (Amstel, et. Al., (2008) assessed the reliability of information of five food ecolabels particularly on the aspects of biodiversity, reference to rule of law to assure buyer's confidence, farmer's compliance and ecological impact. They found that there was ambiguity on environmental themes. The information about the compliance of producers was also inadequate and there was failure to assure the buyers of the ecological impact of the products that are ecolabelled.

Market and government policy also play an important role in promoting agro-biodiversity conservation. In the case of natural rubber latex in Indonesia (Akiefnawati et al., 2011), farmers have difficulty complying with the certification standards of the Forestry Stewardship Council (FSC). There were no factories that were willing to receive eco-certified rubber as the market for certified-rubber is underdeveloped. There was also conflict with government's policy particularly in supporting palm-oil production while no policy supports rubber agro-forestry conservation.

There are three challenges in marketing ecolabelled products according to Ottman, et al., (2006). These are the so called three Cs, namely: consumer value, credibility of claims and calibration of marketing messages to minimize confusion. While ecolabelled products minimize competition as they cater to different market segments, they should be able to create value for consumers based on quality or convenience. They must also pass scrutiny from various groups and be able to communicate clearly the value of the product.

Combining ecolabels and geographic indication (GI) can strengthen small rural producer's development, conservation of biodiversity and marketing efforts (Guerra 2004). This is because GI is a collective guarantee with regards the biological identity and quality of the product particularly in developing countries where biological resources are not usually marketed through brands. Thus, GIs can strengthen market access and can be used as a tool to regulate harvesting and promote rational land use strategies and in-situ conservation of biodiversity (Guerra 2004).

Incentives for producers of ecolabelled products have become attractive which explain why "green advertising" has increased in the last few years but many consumers who patronize green products want certification to be verified. In Indonesia for example, rain forest certified Robusta and Arabica coffee are priced 47% and 13% higher compared to non-certified Robusta and Arabica coffee (EEPSEA Policy Brief 2013).

3. Methodology

There were three types of ecolabelled rice products that were analyzed to examine their demand and willingness to pay. These were certified organic rice, rice products labeled or sold as organic but without organic certification from a third party or an organization that issues organic certification and lastly rice products certified to preserve Ifugao rice terraces as cultural heritage. Ifugao is a province in the Philippines known for its remarkable rice terraces. In the Philippines, it is known to be eighth wonder of the world. In 2013, two municipalities in the province, namely Hingyon and Hungduan are declared as a National Important Agricultural Heritage Site. This trademark is part of the initiative of the Food and Agriculture Organization's program on Globally Important Agricultural Heritage Sites.

A survey was conducted which generated a sample of 230 consumers. A model was estimated to examine the factors that affect the level of price premia that consumers are willing to pay for products covered. In order to ensure that the respondents understand the reasons why the products are ecolabelled, it was explained in the introductory paragraph of the survey that the purpose was to understand the factors that determine demand for environment friendly products or eco-labelled products. It was also mentioned that the results of the survey will be used to develop eco-labelled products and inform government and private sectors to support the promotion of these products that help preserve our environment. Also, the respondent was asked if he is willing to pay for a price premium for ecolabelled products before he or she proceeds to choose the range of price premia. Thus, the respondent attaches a value contingent on the information about the attribute of the product that promotes preservation of the environment.

Interval regression was used to examine the factors that affect the level of price premia that consumers are willing to pay for the ecolabelled products covered. This method is appropriate since we know from the survey the range of premia that the consumers are willing to pay but not the exact premium. The Gnu Regression, Econometrics Library (GRET) software was used to estimate the model.

The model for price premia is specified as follows:

$$PP=f(I, H, C, G)$$

Where

PP= price premium specified in nine categories or ranges of price premia

I=income specified in four income levels or brackets

below USD 326/month

USD 327/mo. – USD 652/mo.

USD 653 – USD 1,087

USD 1,088 – USD 1,522

H=level of health consciousness: 1 if consider self as health conscious and 0 otherwise

C=consumption of organic products: 1 if consuming organic labeled products and 0 otherwise

G=gender: 1 if male and 0 if female

Imposing a linear functional form, the model estimated was:

4. Traditional varieties of rice in the Philippines

The market is expanding for traditional varieties of rice in the Philippines which are usually grown without the use of chemicals. This is in response to changing market conditions where consumers increasingly appreciate living a healthy lifestyle. Part of this is the increasing consumption of organic products. According to Philexport, demand for organic products increased by 20-30% per year (www.philexport.ph).

The value chain for traditional varieties of rice is similar to commercial (modern variety) of rice. For commercial rice, palay or unmilled rice is sourced from the farmers, then sold to traders in the barangay and some are consolidated by municipal traders who mill the rice themselves or sell to large millers. They are then sold to wholesalers and retail outlets that include small retailers in wet markets, supermarkets and institutional buyers such as hotels, restaurants and fast food. Inputs such as fertilizers and seeds are sourced from various outlets including traders who also finance rice production. In some cases, farmers are able to get credit from government financial institutions, micro-finance institutions and non-government organizations. Technical and extension services are provided by government, non-government organizations and private sector.

The main difference between the value chain for traditional rice varieties and commercial rice is the market outlets. Traditional varieties are sold mostly in supermarkets, specialty stores and sometimes they are sold directly by farmers to tourists, hotels and restaurants and consumers (**Figure 2**). They are also sold in traditional wet markets but more recently, they are sold mostly in modern retail outlets such as supermarkets, hypermarkets and specialty stores.

Figure 2. Value Chain for Traditional Rice Varieties

The market for the traditional varieties of rice is quite competitive given the number of brands available in the market produced by small famers and large companies from Luzon, Visayas and Mindanao. There are 16 brands based on the market outlets scanned for traditional varieties such as supermarkets, specialty stores, trade fairs, retail stores, and organic weekend markets (**Table 1**). Scanning was done within two month period (October to November 2014) although majority of the data were collected within a three day period in November. This is to factor out the time element that may affect prices for more accurate comparison of brands across market outlets. The type of market outlets was also included as they also affect prices. Differences in retail or marketing costs across types of market outlets also affect retail prices. It is true that organic products are not necessarily expensive but sometimes they are cheaper because of other factors. These include supply factors (volume of production), seasonality and retailing or marketing costs. If prices are compared to non-organic products, quality of the product should also be considered aside from the aforementioned factors. Generally, however, organic products are more expensive because of low volume of production and productivity. Marketing cost per unit is also high due to low volume of production particularly for small farmers. They are also sold in specialty markets catering to relatively affluent consumers (**Table 1**).

There are three types of labels that can be gleaned from this list of products of traditional rice varieties. These are: 1) labeled as organic that is certified 2) labeled as organic but without certification 3) without organic labels. In what follows, the effect of factors such as certification, location, and type of product (color) on price are discussed.

4.1 Certification

Rice products with organic certification such as Fresh Start, Gilded Grains, and Bios Dynamis are priced higher than those without certification. Prices range from USD 1.2 – USD 3.9/kg. (@ 1 USD to 46 Philippine pesos) and packed in 1kg to 2kgs. On the average, certified organic rice is priced at USD 3.9/kg. (**Table 2**). These products can be found in specialty stores such as the echo stores in Bonifacio Global City & Makati, Department of Agriculture's Agribusiness Center, and in Bios Dynamis outlets in Manila and Davao City. Third party organic certification used in these products came from the Organic Certification Center of the Philippines (OCCP) and Negros Island Organic Certification Services (NICERT).

Table 1. Price of traditional rice by brand, label, market outlet, and weight

Variety/Brand	Label	Type of product (as part of label)	Packed/ Produced by	Main office address	Market outlet sold	Weight	Price (PhP)	Price/kg (Php)
Fresh Start	NICERT certified organic	Heirloom variety Red rice	Fresh Start Organics	No. 3-A, SJ Building, Sta. Clara Drive, Brgy. Mandalagan, Bacolod City	Echo store Makati	2kg	5.9	2.9
Bios dynamis	OCCP certified	Black rice, red, brown	Bios dynamis	Magsaysay Ave., Mlang, Cotabato	Echo store Makati	1kg	3.9	3.9
Gilded Grains	NICERT certified organic	Export quality Organic -RED gold	Better country community corporation	Better Country, Don Simeon cor Silangan, San Lorenzo, Gapan City NE 3105	DA Agribusiness Center	1kg	3.5	3.5
Bios dynamis	OCCP certified	Black rice, red, brown	Bios dynamis	Magsaysay Ave., Mlang, Cotabato	Davao Bios dynamis outlet	1kg	1.2	1.2
Tawid Hill Exotic Rice	Organic*	Brown rice			Echo store Makati	1kg	3.5	3.5

Table 1. *cont.*

Variety/Brand	Label	Type of product (as part of label)	Packed/ Produced by	Main office address	Market outlet sold	Weight	Price (PhP)	Price/kg (PhP)
Sun Made	Organic*	brown rice	Mindanao Agri-network Corp. (Mancor)	Davao City	SM Makati	1kg	1.9	1.9
Cordillera Heritage Harvest rice	Organic*	brown, red, black	Kalinga	Tabuk City Kalinga		1kg	2.2	2.2
Kintoman heirloom rice	Organic*	heirloom rice - glutinous		Kibungan, Benguet	Charmp trade fair in Baguio	1kg	2.1	2.1
Kalinga Unoy	Organic*	organic export quality - heritage RED	Kalinga	Kalinga		1kg	2.6	2.6
Kalinga Jekot	Organic*	organic export quality – heirloom (sticky rice)	Kalinga	Kalinga		1kg	3.3	3.3
Jordan Farms	Organic*	red rice	Sunnywood Superfoods corp	479 J. P. Rizal St., Bgy. Vergara, Mandaluyong City	SM North Edsa	800g	2.1	2.6
Jordan Farms	Organic*	brown			SM North Edsa	800g	1.9	2.4
Jordan Farms	Organic*	tapol de oro, Violet Rice			SM North Edsa	800g	2.3	2.9
Jordan Farms	Organic*	black rice			SM North Edsa	2kgs	5.0	2.5
F & C Forbidden Rice	Organic*	black rice	Upland Marketing Foundation, Inc.	Pasig City	SM North Edsa	500g	1.6	3.2
F & C Healthy Rice	Organic*	red rice				500g	1.2	2.4
Sun Made	Organic*	brown rice	Mindanao Agri-network Corp. (Mancor)	Davao City	Davao (Gaisano, NCCC, Rustans's)	1&5kgs		1.4
Dujali Organic Rice	Organic*	black rice	Coop	Davao del Norte	Davao retail store	1kg	1.2	1.2
Eighth Wonder Kalinga Unoy	Organic*	Export Red rice	Rice Inc.	Kalinga, Ifugao, Mountain Province	Outside Phils.	1lb		12.1
Eighth Wonder Tinawon Fancy Rice	Organic*	Export fancy rice	Rice Inc.	Kalinga, Ifugao, Mountain Province	Outside Phils.	1lb		12.1

Table 1. *cont.*

Variety/ Brand	Label	Type of product (as part of label)	Packed/ Produced by	Main office address	Market outlet sold	Weight	Price (PhP)	Price/kg (Php)
Eighth Wonder Ulikan Red	Organic*	Export red rice	Rice Inc.	Kalinga, Ifugao, Mountain Province	Outside Phils.	1lb		12.1
Dona Maria	not labeled as organic	Jasponica brown	SL Agritech Corp	Laguna	SM North Edsa	5kgs	9.8	2.0
Supermarket house brand	Not labelled organic	brown rice		SM	SM hypermarket	1kg		1.3
Supermarket house brand	Not labelled organic	violet rice		SM	SM hypermarket	1kg		1.7
Dona Maria	not labeled as organic	Miponica brown	SL Agritech Corp	Laguna	Robinson's Davao	5 kgs	9.8	2.0
Harvester's Red rice	Not labelled as organic	red rice	Sunnywood Superfoods corp	479 J. P. Rizal St., Bgy. Vergara, Mandaluyong City	Robinson's Davao	5kgs	7.9	1.6
Dinorado PG Rice	Not labelled as organic	Dinorado			Robinson's Davao	25kgs	26.9	1.1

*labelled as organic but without certification; Source: Market Monitoring November 2014

Table 2. Price of traditional rice by type of label

Type of label	Average Price (USD)	% Difference to Certified organic
Certified Organic	2.9	
Organic*	2.4	20
Not labelled as organic	1.6	51

* Labelled as organic but without certification

On the other hand, average price of rice brands that are labelled organic but do not have organic certification is USD 2.4 per kg. and the price ranges from USD 2.3 – USD 3.3/kg. The average price for certified organic rice is 20% higher than those labeled as organic but without certification and about 51% higher than traditional rice (red, black or brown) not labeled as organic.

A number of these products labelled as organic but without certification are packed in different weights. For example, F & C Forbidden rice (black rice) and F & C Health rice brands are packed at 500g. Jordan Farms is another brand

having red, black, brown, Violet, and Black varieties of rice which were packed at 800g and available in SM North Edsa and other SM outlets. Other heirloom organic rice packed in 1kg were also showcased during trade fair in Baguio City in November 2014 which included Cordillera Harvest Rice, Kintoman heirloom, Kalinga Unoy, and Kalinga Jekot.

Eighth Wonder brands showcasing heirloom rice from Ifugao and Kalinga are exported and available online. Price ranges from USD5.75 – 6.50/lb or USD 12.1/kg. excluding shipping cost (<http://www.heirloomrice.com/store/allprods.php>).

Other red and brown type of rice that are not labelled as organic have lower price ranging from USD 1.1- USD 1.9/kg. with an average of USD 1.6/kg.

4.2 Location

Considering the market outlet of the traditional rice, average price in Luzon is higher by 85% compared to Mindanao (**Table 3**). If we consider the label for each location, average price of certified organic rice sold in Luzon is higher by 33% and 107% higher than those that are not certified and not labelled as organic respectively (**Table 4**). However, in the case of traditional rice sold in Mindanao, price of certified organic rice is lower by 9% compared to non-certified, and much lower by 32% compared to those that are not labelled as organic. This is mainly due to transportation cost and the source of raw material. For example, Bios dynamis with raw materials (produced) in Mindanao is sold at USD 1.2 per kg in Mindanao and USD 3.9 per kg in Manila. Also, another product labelled as organic but without certification and produced from Davao del Norte has the same price as Bios Dynamis sold in Davao City at USD 1.2 per kg. Another brand (Sun Made) which is based in Mindanao sold at USD 1.4 per kg which is higher than Bios Dynamis. However, this is still relatively cheap compared to those sold in Manila. This also indicates high marketing or retail costs in Manila.

Table 3. Average price of traditional varieties by location

Location	Ave. Price(USD)	% difference
Luzon	2.6	
Mindanao	1.4	85

Table 4. Average price of traditional varieties by type of label, and by location

Label	Luzon		Mindanao	
	Average Price (USD)	Price Difference to certified organic	Average Price (USD)	Price Difference to certified organic
Certified organic	3.4		55	
Organic*	2.6	33%	1.3	-9%
Not labelled as organic	1.7	107%	1.8	-32%

* Labelled as organic but without certification

4.3 Type (color and glutinous)

On the average, red rice is priced higher by 7% and 17% than black and brown rice respectively (**Table 5**). Violet/ glutinous rice is priced differently since it is not used as staple food but as ingredient to special delicacies. On the average, Luzon price is 105% higher than the price in Mindanao.

If we consider the label, certified organic red rice sold in Luzon has an average price of USD 3.4/kg with price ranging from USD 2.9 – USD 3.9 per kg. This is 44% higher than those without certification (**Table 6**). Similar to red rice, price of brown rice, black rice, and violet/purple/glutinous rice sold in Luzon are also higher by 63%, 49%, and 60% respectively compared to those without certification. But this is not the case in Mindanao wherein certified organic rice is lower by 24% and 16% for red rice and brown rice, respectively.

Table 5. Price of traditional rice by type of product and by location

Product	Ave. Price (USD)	% difference to Red rice	Ave. Price (USD)		Difference between Luzon & Mindanao
			Luzon	Mindanao	
Red	2.5		2.9	1.4	110%
Black	2.4	7%	2.9	1.2	146%
Brown	2.2	17%	2.4	1.5	58%
Violet/Glutinous	2.5	2%	2.5		
Average	105%				

Table 6. Average price of traditional varieties by type of product and location

Label	Luzon		Mindanao	
	Average Price	Price Difference to organic (%)	Average Price	Price Difference to organic (%)
Red Rice				
Certified organic	3.4		1.2	
organic*	2.4	44	1.6	-24
Brown Rice				
Certified organic	3.9		1.2	
organic*	2.4	63	1.4	-16
Not labelled as organic	1.6	47	2.0	-28
Black rice				
Certified organic	3.9		1.2	
organic*	2.6	49	1.2	-
Violet/purple/Glutinous				
organic*	2.7			
Not labelled as organic	1.7	60		

Clearly, labelling (eg certification), location and variety or type (eg color) affect price of traditional varieties of rice. The above results also show that ecolabeled products such as organic (with or without certification) fetch a higher price. In what follows, factors that affect the willingness of consumers to pay based on the survey results are discussed.

5. Willingness to pay for ecolabeled products

In terms of demographics, about 73% of the respondents are women and 58% are below 44 years old. Majority of the respondents are highly educated. More than half (53%) went to college, 41% with post-graduate studies, 6% went to high school and less than a percent had elementary education. More than a third of the respondents have monthly income from USD 326 to USD 652, 22% have income below USD 326, 18% between USD 652 to USD 1,087 and about 14% have income higher than USD 1,087.

In terms of psychographics or lifestyle, 80% of the respondents consider themselves health conscious. However, only 15% of the sample have been using products that are labelled organic. In terms of the frequency of using organic products, about 39% consume regularly or at least once a week and 61% said they rarely consume organic products. There is a higher percentage of respondents who said they consume either regularly (at least once a week) or rarely than those who consume products that are labelled organic. This can be attributed to possible reasons. One is the notion that the product referred to when they were asked about the frequency of consumption is not necessarily certified or labelled as organic. The other possibility is that those there were some respondents who consume regularly or rarely do not consider themselves as someone who consume products that are labelled organic as this means regularly consuming more than once a week. When asked about the reasons for not consuming or regularly consuming organic products, about 35% said that they are not available in the market, 31% found price expensive and the same percentage said they are unsure if they are really organic.

5.1 Willingness to pay

About 95% of the respondents are willing to pay for price premium for certified organic rice. This is only 1% higher compared to the percentage of respondents who are willing to pay for organic rice without certification. This is perhaps one of the reasons why of the 16 brands of traditional rice varieties (red, brown and black) surveyed, only 3 or 18% have organic certification either from OCCP (Organic Certification Center of the Philippines) or NICERT (Negros Island Certification). However, a different story emerges if one examines the specific price premium that consumers are willing to pay (see below).

The high percentage of respondents willing to pay for price premium can be due to their high level of income and education. About 94% of them have gone to college and 78% having monthly income of more than USD 326. Further insights can be gleaned on the factors that affect level of price premium through the models estimated (see discussion below). In addition, the high percentage of respondents who are willing to pay show the size of the market for these products if they are made available, affordable and claims verified.

5.2 Price premium

In terms of the price premium respondents are willing pay for all rice products, about 26% are willing to pay above 21% price premium where 16% are willing to pay price premium between 21 % to 40% and only 10% are willing to above 40% premium. Approximately 39% are willing to pay between 10% to 20% price premium and 35% are willing to pay below 10% price premium. This trend follows the law of demand such that the willingness to pay (WTP) decreases as the price premium increases. This is illustrated in **Figure 4** which shows the average % of respondents of all products (y axis) against the price premium (PP) categories (x axis).

Figure 4. Consumers' willingness to pay price premium for all ecolabelled products

Figure 4, however, shows a “kinked demand curve” since the percentage of respondents WTP the lowest range of price premium (below 10%) is lower than the next higher range of price premium (10% to 20%) but not compared to the other range of price premium. This kink implies that majority of the respondents are willing to pay a minimum or threshold price premium between 10% to 20% to compensate for environmental claims or attributes.

It is interesting to note that the kinked curve applies to all products except for rice without certification which follows a normal (without a kink) downward sloping demand curve (**Figure 4**). This indicates that certification differentiates the product such that it fetches a higher threshold level.

There are also some notable differences in the price premiums that consumers are willing to pay when it comes to specific products. For example, while there is only 1% difference in the percentage of respondents who are willing to pay for price premium between certified organic rice and organic rice without certification, there is a large difference in terms of the price premium consumers are willing to pay between these products. For rice products without organic certification, about 56% of the respondents are willing to pay a price premium of less than 10% compared to only 26% for rice with organic certification. Also, about 35% of the respondents are willing to pay price premium higher than 20% for rice with certification compared to only 14% for rice without certification. Thus, more consumers are willing to pay higher prices for certified organic products. This is consistent with the existing prices surveyed in market outlets of 17 brands where average price of 3 brands that have organic certification was 25% higher compared to brands without certification.

5.3 Factors affecting level of price premium

Results of the survey as well as the model estimated show that there are several demographic and psychographic factors that may affect the level of price premium that consumers are willing to pay. Demographic factors include gender, age, education and income and psychographic factors include level of health consciousness and whether the respondent is a consumer of organic products.

5.3.1 Demographic factors

In terms of gender, women are willing to pay higher price premium than men. For all ecolabelled products, an average of about 86% of men are willing to pay price premium below 20% compared to only 70% for women. On the other hand, only 14% of men are willing to pay more than 20% price premium compared to 30% for women. Particularly for certified organic rice, 41% of women are willing to pay more than 20% premium compared to only 15% for men. Also for products certified to preserve heritage sites, only 13% of men are willing to pay for price premium above 20% compared to 27% for women but the opposite is true for price premium below 20%.

For age, there is not much a pattern in terms of the willingness to pay. Respondents who belong to three age categories below 44 years old do not have much difference in terms of their willingness to pay across price premium categories. On the average, about 77% of them are willing to pay price premium below 20% and 23% of them are willing to pay price premium above 20%. This is different compared to respondents belonging to age group 45-54 where 63% are willing to pay price premium below 20% and 37% are willing pay above 20% price premium. About a quarter in this age group are willing to pay premium between 21%-40%.

In terms of educational attainment, there is a big difference in the willingness to pay between respondents who went to high school compared to those who went to college or did some postgraduate studies. On the average considering all products, most of those who went to high school (about 90%) are willing to pay price premium below 20% compared to 73% for those who went to college or post-graduate studies. The difference between those who went to college and to those who went to postgraduate studies is not as big compared to those who went to high school. However, there is a relatively a higher percentage of respondents who went to post graduate studies who are willing to pay for higher premium compared to those who went to college. About 45% of those who went to post-graduate studies are willing to pay price premium between 10% to 20% compared to 34% for those who went to college. On the other hand, only 29% of those who went to post-graduate studies are willing to pay price premium below 10% compared to 39% for those who went to college. The pattern is similar at the product level.

Income appears to be not affecting the level of price premium that respondents are willing to pay. The percentage of respondents willing to pay price premium lower than 20% does not vary across income brackets which ranges from 71% to 80%. In fact, when these income brackets are aggregated from five into two brackets (those below USD 652 per month and those above USD 652 per month), the difference between the percentage of respondents willing to pay below 20% premium between these two income categories is almost nil (only 1%). However, there is some difference when we disaggregate the price premium below 20%. A larger percentage of respondents are willing to pay price premium below 10% for those who have lower income but the opposite is true for higher price premium between 10% to 20%. In this case, more of those who have higher income are willing to pay higher premium albeit the difference is only 6%.

5.3.2 Psychographic factors

The effect of a respondent who is already consuming organic products on the level of price premium he or she is willing to pay is compared to the one who is not consuming organic products. Considering all ecolabelled products covered, the data show that there is not much difference between those who are already consuming organic products and those who are not. About 41% of those who are already consuming organic products and about 43% of those who are not, are willing to pay price premium below 20%. The small difference between the two types of respondents generally applies at a product level except for certified organic rice where the difference is quite significant. About 83% of those who are not consuming organic products are willing to pay less than 20% compared to 63% for those who are consuming products. Thus, only 17% of those who are not consuming organic rice are willing to pay price premium more than 20% compared to 37% for those who are already consuming. As expected, those who are already consuming organic rice are willing to pay higher prices compared to those who are not consuming organic products. In fact, almost a quarter of those who are already consuming organic rice are willing to pay price premium between 21% to 40%.

The effect of the level of health consciousness on the price premium is similar to the one whether the respondent is

a consumer of organic products or not. Generally, there is no significant difference between the price premium that a consumer who considers himself health conscious is willing to pay compared to a consumer who does not consider himself health conscious. Considering all products, about 78% of the respondents who are not health conscious are willing to pay less than 20% price premium compared to 73% for those who are health conscious. Alternatively, there are 27% of health conscious respondents are willing to pay more than 20% price premium compared to only 22% for those who are not health conscious. However, the difference becomes bigger in the case of certified organic rice. For example, 41% and 23% of health conscious respondents are willing to pay price between 10% to 20% and 21% to 40% respectively. For those who are not health conscious, only 12% are willing to pay price premium between 21% to 40%. Also, about 39% of those who are not health conscious are willing to pay less than 10% price premium compared to only 23% for those who are health conscious.

An econometric model using integral regression was estimated to simultaneously examine the effect of both demographic and psychographic factors on the level of price premium that consumers are willing to pay.

Generally, the results are consistent with the findings in the previous section where each demographic or psychographic factor is related to the level of price premium that consumers are willing to pay. The advantage is that it provides whether the relationship between these factors and the price premium is statistically significant. The model also provides a quantification of the magnitude and the direction of this relationship.

For certified organic rice, the older the respondents the higher their willingness to pay price premium. A respondent is willing to pay 0.2% more for certified organic rice than a respondent that is one year younger. Respondents that consider themselves health conscious are willing to pay 4.3% more for certified organic rice. Respondents who are already consuming organic-labeled products are willing to pay 4% more for certified organic rice compared to those who have not consume organic-labeled products. The five income levels were represented in the model by four dummy variables, each representing the first four income level. The 5th income level is represented in the model when all the dummy variables are all zeros. Thus, the coefficients of the four dummy variables can be interpreted as the difference in price premium respondents from the first four income levels are willing to pay from the respondents from the last income level. For example, a respondent from the fourth income level is willing to pay 14% more than the respondents from the fifth income level. Positive coefficients of the four dummy variables indicate that the four lower income level is willing to pay more for certified organic rice than the respondents from the fifth (highest) income level. Also, except for the fourth income level, the value of the coefficients declines as we move up in the income levels (0.16, 0.13 and 0.11 for income levels 1, 2 and 3). Therefore, we can infer from the sample that the higher the income the respondents have the lower the price premium they are willing to pay for certified organic rice (**Table 7**).

Table 7. Certified organic rice, interval regression results

Missing or incomplete observations dropped: 2					
Lower limit: eL, Upper limit: eU					
Standard errors based on Hessian					
	Coefficient	Std. error	z	p-value	
Const	-0.149234	0.0922376	-1.618	0.1057	
Age	0.00271338	0.00101394	2.676	0.0074	***
Healthconscious	0.0430959	0.0234174	1.840	0.0657	*
Consumeproducts1~	0.0406419	0.0242781	1.674	0.0941	*
Gender	-0.0179708	0.0278757	-0.6447	0.5191	
DIncomeLevel_1	0.164823	0.0651434	2.530	0.0114	**
DIncomeLevel_2	0.134602	0.0597059	2.254	0.0242	**
DIncomeLevel_3	0.112156	0.0598957	1.873	0.0611	*
DIncomeLevel_4	0.147769	0.0636814	2.320	0.0203	**
Chi-square (8)	17.49189	P value		0.025376	
Log-likelihood	-54.37245	Akaike criterion		128.7449	

Table 7. cont.

Missing or incomplete observations dropped: 2 Lower limit: eL, Upper limit: eU Standard errors based on Hessian				
	Coefficient	Std. error	z	p-value
Schwarz criterion	148.6347	Hannan-Quin		136.4156
Sigma = 0.0698099 (0.00805244)				
Left-unbounded observations: 0				
Right-bounded observations: 0				
Bounded observations: 52				
Point observations: 2				
Test for normality of residual –				
Null hypothesis: error is normally distributed				
Test statistic: Chi-square (2) = 31.474				
with p – value = 1.4639e-007				

For rice products certified to preserve banawe rice terraces as a cultural heritage site, the older the respondents the higher their willingness to pay (price premium). A respondent is willing to pay 0.3% more for rice products certified to preserve banawe rice terraces as a cultural heritage site than a respondent that is one year younger. Unlike in the “certified organic rice” case, this time all the coefficients of the income levels, except for the third income level, have, more or less, the same value. However, results still show that the four income levels are willing to pay more compared to the fifth income level. This may be due to the discrepancy in sample size from the fifth income level (**Table 8**).

Summary of the effects of psychographic and demographic factors is presented in **Table 9**.

Table 8. Rice products certified to preserve banawe rice terraces as a cultural heritage site, interval regression results

Missing or incomplete observations dropped: 2 Lower limit: fL, Upper limit: fU Standard errors based on Hessian					
	coefficient	Std. error	z	p-value	
Const	-0.138025	0.0714361	-1.932	0.0533	*
Age	0.00342714	0.000788688	4.345	1.39e-05	***
Healthconscious	-0.0117332	0.0188956	-0.6209	0.5346	
Consumeproducts1~	0.0219005	0.0195023	1.123	0.2614	
Gender	-0.0245018	0.0221820	-1.105	0.2693	
DIncomeLevel_1	0.112761	0.0492654	2.289	0.0221	**
DIncomeLevel_2	0.121456	0.0448713	2.707	0.0068	***
DIncomeLevel_3	0.0779774	0.0450695	1.730	0.0836	*
DIncomeLevel_4	0.110548	0.0482271	2.292	0.0219	**
Chi-square (8)	24.99446	P value		0.001558	
Log-likelihood	-41.22813	Akaike criterion		102.4563	
Schwarz criterion	122.3461	Hannan-Quin		110.1270	
Sigma = 0.0535422 (0.006092)					
Left-unbounded observations: 0					
Right-bounded observations: 0					
Bounded observations: 51					
Point observations: 3					
Test for normality of residual –					
Null hypothesis: error is normally distributed					
Test statistic: Chi-square (2) = 46.1715					
with p – value = 9.4184e-011					

Table 9. Effects of demographic and psychographic factors on price premium

Ecolabelled Products	Statistically significant variables	Quantitative effect of significant variables
Certified Organic rice	Gender Consuming organic products	<ul style="list-style-type: none"> • Women are willing to 8.5% higher compared to men • Those who are already consuming organic products are WTP 6% more compared to those who are not consuming organic products
Rice products labelled/sold as organic but without official organic certification	Gender Age Income	<ul style="list-style-type: none"> • Women are WTP 5% higher compared to men • PP increases by .17% per additional year (age) • Consumers with income above USD 652 per month are WTP 4% lower compared to those with income below USD 652 per month
Rice products certified to preserve Ifugao rice terraces as a cultural heritage site	Gender Consuming organic products	<ul style="list-style-type: none"> • Women are willing to pay 6% higher compared to men • Those who are already consuming organic products are WTP 5% more compared to those who are not consuming organic products

6. Concluding comments

Most consumers are willing to pay for ecolabelled products but the willingness varies depending on the level of price premium. These include products certified to conserve agro-biodiversity, indigenous varieties including rice, cultural heritage (eg hadwoven products from abaca), certified organic rice, etc.

The willingness to pay decreases as price premium increases which follows the normal demand curve. However for most ecolabelled products except rice without organic certification (the only one without certification), there is kinked demand which implies that there is a minimum price premium that most consumers are willing to pay.

Certification fetches higher price. All the nine ecolabelled products considered are certified except one on rice products sold as organic but without certification. The latter follows the normal downward sloping demand curve with majority of the respondents willing to pay the lowest possible price (below 10%). This is consistent with the actual prices monitored from various market outlets.

Majority of the respondents are willing to pay price premium for ecolabelled products that range from 10% to 20%. About 75% of the respondents are willing to pay price premium for ecolabelled products below 20% and about a quarter are willing to pay above 20%. About 15% of the respondents are already consuming organic products. One of the possible reasons is that currently, ecolabelled products such as the traditional rice varieties (red, brown and black) labelled as organic with or without certification are currently price more than 20%, in fact 104% more compared to those traditional rice not labelled organic. Thus, a lower price may expand the market. In fact more than 30% of the respondents cited high price of organic product as one of the reasons why they don't purchase it.

Modelling results show that gender, age, income and being an organic consumption consumer significant affect the level of price premium.

7. Funding Statement

This work was supported by the Food and Agriculture Organization (FAO)

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Figure 5. Consumer's willingness to pay price premium by product

Figure 6. Consumers' willingness to pay price premium by product