The Process of Changing Traditional Knowledge into Value for Money: Palmyra Sugar Cake from Borassus Flabellifer in Phetchaburi

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Abstract

The objective of the research was to study the production process with regard to Palmyra sugar cake, which uses the traditional knowledge of local people, to determine and assess the monetary value of producers who use ancient techniques. A purposive sample of 21 producers was studied; financial analysis method was used to assess the monetary value. The research showed that Palmyra sugar cake is a cultural product in Phetchaburi. Initially, palm sugar cake was produced for subsistence reasons and, when demand grew, it became a commercial product. The community produces all materials in the production process. The expenditure for each step demonstrated that total cost (TC) was 254,213 Baht, broken into 144,928 and 109,285 Baht for fixed and variable costs, respectively. The revenue was 2,875,298 Baht, which showed a profit of 2,776,397 Baht. In terms of monetary value, the Net Present Value (NPV) was 1,148,959 Baht with an 8 % discount rate, Internal Rate of Return (IRR) was 28 % and the Benefit and Cost Ration (B/C) was 11.30. Thus, this shows that traditional knowledge generates revenue. The transfer of knowledge and conservation techniques of Palmyra trees need to be further promoted in order to maintain local wisdom and lifestyle.

Keywords: Palmyra Sugar Cake; Value for Money; Traditional Knowledge Process

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Introduction

Borassus flabellifer is a palm tree that descends from one of the oldest families trees in Africa and Asia, especially in Southern Asia. In Thailand, it is called Tantanot or Not which is a local plant in the Songkla and Phetchaburi provinces, and it has become a symbol and an important crop of both provinces (Phaichamnan, M. et al., 2010). A reason for its popularity is that the plant has multiple uses for its roots and leaves. It also has a long life. Every part of the Palmyra palm can be applied to all benefits (Johnson, D., 1992). The potential of the Palmyra palm can create economic value added products. Nowadays, the Palmyra palm is being established by Phetchaburi province in support of the "creative economy" of Thailand to help create stable and sustainable revenue within the province (Department of Intellectual Property, Ministry of Commerce, 2010).

Palmyra palm sugar cake (Figure 1) is a natural product made from the sap of the Palmyra palm tree, which is processed by boiling collected sap until it thickens. The Palm sugar cake obtained after processing is brown and richer in color. The product can be marketed in the form of a brick or a cake. It is highly priced as Palmyra sugar cake also has applications in the food industry; it is an ingredient for cooking both main dishes and delicious sweets, and it is quite popular. As a result, the price of the Palm sugar cake is double that of cane sugar in both this particular province and other regions.

(A) Boiling the sap on an open fire

(B) Stringing the liquid sap

Figure 1 Production process of Palmyra sugar cake

(C) Thickening the concentration

(D) Pouring the thickened sap into a mould

Figure 1 Production process of Palmyra sugar cake (Cont.)

A traditional process for making Palmyra palm sugar cake arises from the use of the potential of Palmyra palm cropping with the traditional tacit practice of village producers, which have been transferred from the older generation to the new generation. These techniques include the Palm sap tapping process at the time of harvesting, Palmyra climbing, the slicing the inflorescence of male and female Palm to exude sap, and collect it in bamboo tubes, filtering the sap using a transparent soft cloth, boiling the sap in massive iron pans and stirring until it thickens. This leaves producers with a range of marketable products (Vengaiah PC. et al., 2013). Traditional production methods create added value. By integrating existing resources and promoting added value, the benefits of producing the product can also increase, as the sugar can be processed into Palmyra sugar granules. The amount of Palmyra sugar cake has increased dramatically (Table 1).

Table 1 The amount of sugar cake produced in Phetchaburi province

Production Year	Yield (tonnes)	Percentage (%)
2013	100,968	27.22
2012	102,579	27.65
2011	102,534	27.64
2010	32,376	08.72
2009	32,440	08.74
Total	370,896	100.00

Source: Phetchaburi Agricultural Office, Thailand (Phetchaburi Agricultural Office, 2016)

Therefore, there is a question as to whether Palmyra sugar cake is capable of producing added value for manufacturers and professionals, and there are question about the possible future value of Palmyra palm sugar cake. Therefore, it is necessary to verify and assess value added products produced using traditional techniques in order to find a long-term value-added industry.

Objective of the study

The aim of the present study was to determine how the traditional process of Palmyra sugar cake production can serve as creative income source in the community and to estimate how much income the community receives in terms of cash value for local workers, as well as at the level of the national economy.

Research methodology

1. Target population and the study areas

The target population was 21 Palmyra palm producers. The districts of Banlad and Mueang in the Phetchaburi province, which is popular for Palmyra palm production, were selected for the study.

2. Data collection

Primary data sources were obtained from a field survey in order to obtain quantitative data. A well-structured questionnaire was also used to collect quantitative data from 21 Palmyra palm producers in the year 2012 – 2013. The researcher used purposive sampling based on the following criteria: (1) the producer must have no less than three year's experience; (2) the producers must have owned or rented Palmyra palm trees; and (3) the producer must have gained revenues from this occupation of not less than 20,000 Baht per annum. In the case of secondary source, these consisted of information concerning the production and marketing of the Palmyra industry. This information was contained in the Palmyra research and relevant academic reports, which have been published and released both in the private and government sectors. These were taken into account in the analysis.

Data used for analysis consisted of producers' level of education, experience, funding source, number of Palmyra trees, number of labourers used for work, production process, the production cost, marketing channels and revenue etc.

3. Methodology and research design

As the purpose of this study was based on determining and assessing the production process of Palmyra palm, which used local traditional knowledge in order to create monetary value within the local area, the following procedures were examined:

1. Tapping palm: the process of harvesting Palmyra sap;
2. Collecting sap: how producers exude and store sap from the flower bund of Palmyra tree;
3. Boiling sap: the process of evaporating liquid palm sap into solid palm sugar cake; and.
4. Marketing: the marketing channels used by villagers to sell their products.

After that, the expenditure in each performance process was estimated and also evaluated in terms of cash and financial function.

4. Data analyses

The expenditure of each process was tallied using the amount of raw materials multiplied by the price of the production factor in the market. The revenue was obtained by looking at total sales, using the current selling price for Palmyra sugar cake in the market. Total profit was equal to total revenue minus total costs, or TR - TC. As one objective is to assess monetary value, the financial analysis tools were applied to estimate the value of products that were produced using traditional techniques, The tools used are as follows:

1. Net present value method. Using the equation:

$$NPV = \sum_{t=1}^{n} \frac{R_t - C_t}{(t+k)^t} \tag{1}$$

where

NPV = net present value
R_t = net cash flow at the year t
C_t = cost of investment at the year t
t = year of the study
n = period of project ie. 10 year
k = discount rate at 8 %

2. Internal rate of return method, IRR. Using the Equation:

$$\sum_{t=1}^{n} \frac{Rt}{(1+r)^t} - C_0 \qquad NPV = 0 \tag{2}$$

where

R_t = net cash flow at the year t
C_0 = total initial investment or cost of project at year 0
t = year of the study
n = period of project, 10 year
r = discount rate at 8 %

3. Cost and benefit ration method or B/C. Using the equation:

$$BCR = \frac{\sum_{t=1}^{n} R_t \quad R_t}{\sum_{t=1}^{n} C_t \quad C_t} \tag{3}$$

where

R_t = revenue at the year t
C_t = cost of project at the year t
t = year of the study
n = period of project, ie., 10 year

Result of analysis and conclusion

In respect to determining how the traditional process of Palmyra sugar cake production can serve as creative income source in the community, the information sought on the background of producers revealed the average age of producers was 61.57 years. Almost all of the producers had received an elementary level education but their experience with Palmyra was very high, averaging 37.28 years. Their funding sources were personal or family based. The number of Palmyra trees used for making Palmyra sugar cake totalled 426, divided into 319 male trees and 107 female trees. All of the producers used household labour in their work.

1. Production of Palmyra sugar cake

This section consisted of three items: harvesting Palmyra sap, Collecting Palmyra sap and boiling the sap. Harvesting Palmyra sap starts with the tapping process, which is done in the morning and the evening. The process includes Palmyra palm climbing, slicing the florescence to exude sap and collecting the sap in bamboo tube sections. Each tapper has to climb 20 to 35 trees each and each tree averages 35 m in height.

They use bamboo wood as a ladder to climb the Palm trees. Traditional techniques used do not involve machine or modern technology.

At the time of collecting sap, producers place some Prayom wood (Shorea floribunda) in the bamboo sections. This is traditionally submerged in Palmyra sap to protect or retard microbial fermentation. All the collected sap in bamboo tubes is poured into gallon jars and sent to the boiling house. All the sap is then filtered by transparent cloth before being transferred into a boiling open iron pan on a traditional furnace.

The sap is boiled in the iron pan until it thickens. During boiling, a white scum arises to the surface, which is skimmed off. This is done to neutralize and remove any contaminant. The boiling process is continued until the sap becomes a semi-liquid brown syrup. The boiling is stopped and the pan is taken from the furnace and stirred until the syrup cools down and thickens. After this, the sap becomes Palmyra palm sugar cake and it is finally poured into jars or plastic containers for market distribution. The product may be kept at the producers' homes for approximately one to two days while awaiting sale.

2. Marketing of Palmyra sugar cake

After finishing the production process, the Palmyra sugar cake is contained in jars, solid blocks and plastic boxes. The product is then ready to be sent to the market. The results from the survey showed that there are two marketing channels for products: 5.05 % are sold directly by producers, and 94.95 % are sold through middlemen in the local area. At the time of the study, the price of Palmyra palm sugar cake was 40 Baht/kg at the production site. The producers' marketing cost are borne by the buyers. The data is tabulated as follows:

Table 2 Marketing channels and value of sale

Marketing channels	Value of sale (Thai Baht)	Percentage (%)
Sold by producers	144,928	5.05
Sold by middlemen	2,727,900	94.95
Total revenue	2,872,828	100

3. Production cost of traditional process

In estimating the production cost of Palmyra sugar cake, it was well known that the process of production uses traditional techniques, so the cost of production is not particularly expensive. Fixed costs include bamboo sections or tubes for collecting sap, bamboo wood ladders for climbing and Palmyra rental or, if owned trees are used,

the opportunity cost is computed. Variable costs mostly include dead wood used as furnace charcoal, Prayom wood and the opportunity cost of household labour compared to the wage rate in the labour market. Table 3 illustrates that the fixed cost of Palmyra palm sugar cake was higher than the variable fixed costs.

Table 3 Production cost of Palmyra palm sugar cake

Category of cost	Amount of cost (Thai Baht)	Percentage(%)
Fixed cost	144,928	57.02
Variable cost	109,285	42.98
Total	254,213	100

4. Analysis of value from the current traditional process in use

This section estimates how much income the community receives in terms of cash value for local workers. The total revenue of Palm sugar cake was 2,872,828 Baht. Palmyra palm sugar made a profit of 2,618,615 Baht (2,872,828 – 254,213, TR-TC). The following table shows calculations in terms of NPV and IRR, both discount – rated at 8 % over 10 years, as well as in terms of Cost and Benefit Ratio (B/C).

Table 4 The value of Palmyra sugar cake

Types of the different financial analysis			
Profit (TR-TC) (Thai Baht)	NPV (at P/F, 8 %, 10 yrs, (Thai Baht)	IRR (at MRR 8 %)	B/C
2,618,615	1,148,959	28	11.30

The product gained values that were higher than the minimum rate of return of 8 % by bank lenders in the financial market. The interesting issue is that the Palmyra sugar cake group was appropriate for long – term investment because of its high rates of IRR and B/C.

Palmyra sugar cake has high potential for creating value added products as well as occupations in Phetchaburi communities. The return on investment is higher than producers' expenditure. The IRR was high at 28 % with MRR and B/C ratio was also high at 11.30. This analysis shows the potential value of traditional knowledge in the Palmyra sugar cake production.

Table 5 The sensitivity analysis with increased expenditure and decreased cash flow

Types of sensitivity analysis at 5 %		
Financial methods	Increased expenditure but revenue unchanged	Decreased revenue but expenditure unchanged
NPV	1,089,304	1,034,544
IRR	26.05	26.02
B/C	9.81	9.78

Table 5 shows the sensitivity analysis, it found that the project of Palmyra Sugar cake created income for producers. This is because the rate of return was higher than the MRR, ie., NPV was higher than 0, IRR was higher than 8 % and also B/C was higher than 1.

Discussion and recommendations for future study

This paper examined how traditional knowledge creates monetary value from the production of Palmyra sugar cake. The study faced a certain phenomenon, which is discussed as follows.

The monetary value of Palm sugar cake was from the use of traditional procedures in the production of Palmyra sugar cake. The traditional processes used to make Palmyra sugar cake create income; the transfer of ancient knowledge and ancestors' experience to contemporary producers. This corresponds with Howkins, J. (Howkins, J., 2007) "creative economy," which illustrates how old culture and wisdom can be applied to a new culture, and then be published or exploited commercially. It is a gift from the ancestors (generation to generation). Profit is made through local knowledge management.

The production of Palmyra sugar cake depends on the support and promotion of planting Palmyra, with more conservation of Palmyra Palm supported by both the private and government sectors. Promoting Palmyra plantations and adding or maintaining Palmyra palm trees and the inherited knowledge in the profession will be useful for a new generation and will create a potential revenue-generating culture in the Phetchaburi province (Oranut, K., 2008).

Palmyra Palm sugar cake production is viable, in terms of both career development and production investment, but it has problems in terms of a lack of specialized labor, and a new generation who are rarely interested in this professional inheritance (Khamrod, P., 2009).

The primary source of intellectual development is oral history. Using traditional knowledge to generate value is still acceptable. This has not yet been classified in the high - potential criteria. It is something that requires further development. Study guides on Palmyra sugar cake products have not yet completely integrated development packaging, modern distribution sources or product prices. Neither have they developed existing know - how into a network of competing professionals that would help make products sell rapidly (Sottipan, P. et al., 2004).

From on - site studies, Palmyra sugar cake can generate income within the community but villagers currently display low interest. Future research should focus on why the new generation has not paid attention to this relatively high - income occupation.

Conclusions

Palm sugar cake is a cash product that originated from a traditional production process. It creates monetary value and high potential for creating value added products; it can also create continuing occupations for communities in Phetchaburi. Its returns are higher than its expenditure. The dominant product uses traditional techniques in production to generate monetary value, as shown by the financial analysis study. These values of Palmyra sugar cake indicate the product is a part of the creative economy of Phetchaburi, which supplies the cultural goods and services market.

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