

Marketing Procedures and Profit: A Case Study on Medicinal Plants at Selected *Tamu* (Traditional Market) in Sabah, Malaysia

Julius Kodoh[#], Fatin Nur Ain Dzulkarnin, Affendy Hassan, Mandy Maid

Faculty of Tropical Forestry, Universiti Malaysia Sabah, Jalan UMS, 88400 Kota Kinabalu, Sabah, MALAYSIA.
[#]Corresponding author. E-Mail: julius@ums.edu.my; Tel: +6088-320000; Fax: +6088-320876.

ABSTRACT Medicinal plants are the main products of the local herbal industry. These plants were identified as the potential sources of economic growth and socio-economic development of the local people. The marketing of medicinal plants in Malaysia has been developing rapidly based on their importance in the Malaysian economy. High-value herbal products have been categorized as one of the 12 National Key Economic Areas in Economics Transformation Program of Malaysia. However, less attention was given to the marketing and trading chain, targeted market, and income sources for the local people. This research was carried out in selected *Tamu* in Sabah to identify the commonly marketed and traded medicinal plant species; document the part of medicinal plants utilized; identify marketing pattern and market chains of the medicinal plants trade; and investigate the profit margins of the medicinal plant trade. The data were collected from seven major *Tamu* at seven districts in Sabah involving face-to-face interview of 64 local traders using a semi-structured questionnaire. A total of 53 species of medicinal plants were traded at these *Tamu*. The most marketed medicinal plants were Raja kayu (*Koompassia malaccensis*), Mas cotek (*Ficus deltoidea*), Kayu panas (*Goniothalamus roseus*), Jerangau merah (*Boesenbergia stenophylla*), and Halia merah (*Zingiber* sp.). The plants were mostly sold as unprocessed raw plants (69.5%). The most utilized part of plants was leaf and fruit. Three (3) channels of the marketing chain were involved, namely, i) self-collected (29.7%); ii) buy directly from collectors (53.1%); iii) buy from middlemen (17.2%). The sellers' profit margins varied and were mainly affected by the types of marketing chain chosen by the sellers. However, the profit margin contributed significantly to the income of the communities. The average monthly profit margin of selling medicinal plants products by the local traders were 60.33% (RM924.07/USD223.21). The results showed that medicinal plants products have a substantial profit margin, indicating profitable sales for the local traders. This study showed that medicinal plants products have a potential source of income to the local traders involved.

KEYWORDS: Medicinal Plant Products; Local Trader; Local Market; Market chains; Profit Margin

Received 10 June 2021 Revised 23 June 2021 Accepted 15 July 2021 Online 23 December 2021

© Transactions on Science and Technology

Original Article

INTRODUCTION

A medicinal plant is any plant which, in one or more of its organs or in some cases combinations of plants are used for best results, contains substances that can be used for therapeutic purposes or which are precursors for the synthesis of useful drugs (Sofowora *et al.*, 2013; Maikhuri *et al.*, 2010), in some cases combinations of plants are used for best results, contains substances that can be). Medicinal plants play a key role in helping treat diseases, contributing to the preservation of the environment, of knowledge and tradition (Oliveira *et al.*, 2015). More than 90% of traditional medicine remedies contain medicinal plants and have been used in healthcare since time immemorial (Sofowora *et al.*, 2013), as the only therapy of many communities and ethnic groups (Santos, 2008), used for medical purpose to cure illness & symptoms which used by the indigenous people and local communities (Kulip, 2014; Kulip *et al.*, 2010), not only in rural but also in urban areas as an alternative or complementary treatment to official medical treatments (Dorigoni *et al.*, 2001), because of the low standard of living of the population and the high cost of medicines (Newall *et al.*, 2002). Most of the population still uses complementary practices (medicinal plants) for health care to relieve or even cure some diseases, cheaper than manufactured drugs, safe for their health (Oliveira *et al.*, 2015), and has a family inheritance (Vigano *et al.*, 2007; Oliveira *et al.*, 2015). Interest and satisfaction on medicinal

plants as a vegetable garden in their own backyard were also reported by Arnous *et al.*, (2005), and Carvalho *et al.*, (2013).

In Malaysia, local people living in the rural area still depend on medicinal plants since it can be found easily in the nearby forest (Kulip, 1997) and own farm around houses (Kulip, 1997; Kodoh, 2006). The medicinal plants (MPs) have provided useful and valuable materials for the local people of the state of Sabah (Kodoh *et al.*, 2009), as significant resources for the well-being of the local communities (Kodoh *et al.*, 2017). In Sabah, the presence of local market, commonly known as *Tamu*, makes the MPs available to the people of different lifestyles and areas. From a cultural and community perspective, *Tamu* is a place for gathering (Chong & Low, 2008; Michael *et al.*, 2014). The gathering refers to communities that come together, socializing and thus lead towards buying and selling activities. *Tamu* is where most of local traders gather to buy, sell, or barter their farm produce, Non-Timber Forest Products (NTFPs), handicrafts, traditional ware, musical instruments, etc. (Kodoh, 2005). At the *Tamu*, MPs are sold in many forms and derived from different plant parts accordingly to their utilization properties (Kodoh *et al.*, 2017).

Marketing is a process whereby individuals or groups obtain what they need and want by exchanging products, services, and value with others. On the other hand, trading is defined as buying and selling of products or services between buyers and sellers. When many products are successfully sold or traded, it shows that the marketing strategy is effective. In business, marketing and trading are the two co-dependent factors (Khalid *et al.*, 2012). Ingram (2010), defined the value chain context as the entire set of processes and activities involved in getting a product from harvest in the forest, including storage, transportation or processing and marketing to the final consumer.

The marketing of medicinal plants in Malaysia has been developing rapidly based on their importance in the Malaysian economy. High-value herbal products have been categorized as one of the 12 National Key Economic Areas (NKEA) in the Economics Transformation Program of Malaysia (ETP Annual Report, 2014). However, less attention was given towards the marketing and trading chain, targeted market, and the role as income sources for the local people. This research was carried out at seven selected *Tamu* in Sabah to identify the commonly marketed and traded medicinal plant species; document the part of medicinal plants utilized; identify marketing pattern and market chains of the medicinal plants trade; and investigate the profit margins of the medicinal plant trade. *Tamu* is where the plants are sold, which can be the most basic ground in understanding the medicinal plants that have been used by people (Andel *et al.*, 2008; Michael *et al.*, 2014). In addition, this study helped on identifying the most traded MPs and their profit margin, which showed MPs as a potential source of income to the local traders.

METHODOLOGY

Study Sites

Sabah is the second largest Malaysian state (Sabah Statistics Dept., 2000) and known with its ethnics group diversity and richness in NTFPs (Tongkul, 2002). In Sabah, most NTFPs sellers traded their products such as MPs regularly at *Tamu* which scheduled weekly at daytime. This research was conducted on October and November 2015 at seven (7) selected *Tamu*.



Figure 1. Study area of 7 selected *Tamu*

Sampling Techniques

The survey was conducted in October and November 2015 during weekday and weekend. Two types of sampling techniques were applied in this research which was selective sampling and stratified random sampling. Seven (7) *Tamu* were selectively chosen for this research, namely, *Tamu* Ranau, *Tamu* Papar, *Tamu* Tambunan, *Tamu* Beaufort, *Tamu* Keningau, *Tamu* Tenom and *Tamu* Sipitang (Figure 1). These *Tamu* are the main local market in its region. Local people buy and sell various kinds of goods and service at these *Tamu*. MPs trading is not be the main business at these *Tamu*, but the trading activity of MPs is not infrequent or atypical. These selected *Tamu* were not supposed to reflect or represent the dynamics of all *Tamu* in Sabah as every region or districts have various variables such different main ethnicity, plants species composition, forest cover area and landform. At the selected *Tamu*, 100% sampling of the sellers that sell MPs was done. Interviews were done on each one of MPs' sellers once a week at every *Tamu*. The stalls were divided into 3 sizes which are small (<1 m³), medium (>1 m³ <3 m³), and large (>3 m³). These procedures were done to achieve the equitable respondent that can riposte to the research question and contribute to ample edifying findings. The sampling technique is shown in Figure 2.

Research Tools and Data Collection

This research was done based on both primary and secondary information. This research employed three main tools: analysis of secondary information, market and trading survey using specifically designed semi-structured questionnaire and observation during the field survey.

i. Secondary information analysis

The literature review conducted in this field has helped in determining the gap of research on MPs. Available and reliable literature were reviewed and analyzed meticulously throughout this research and compared with the findings of this study. Research also was done on these literatures to construct the questionnaire.

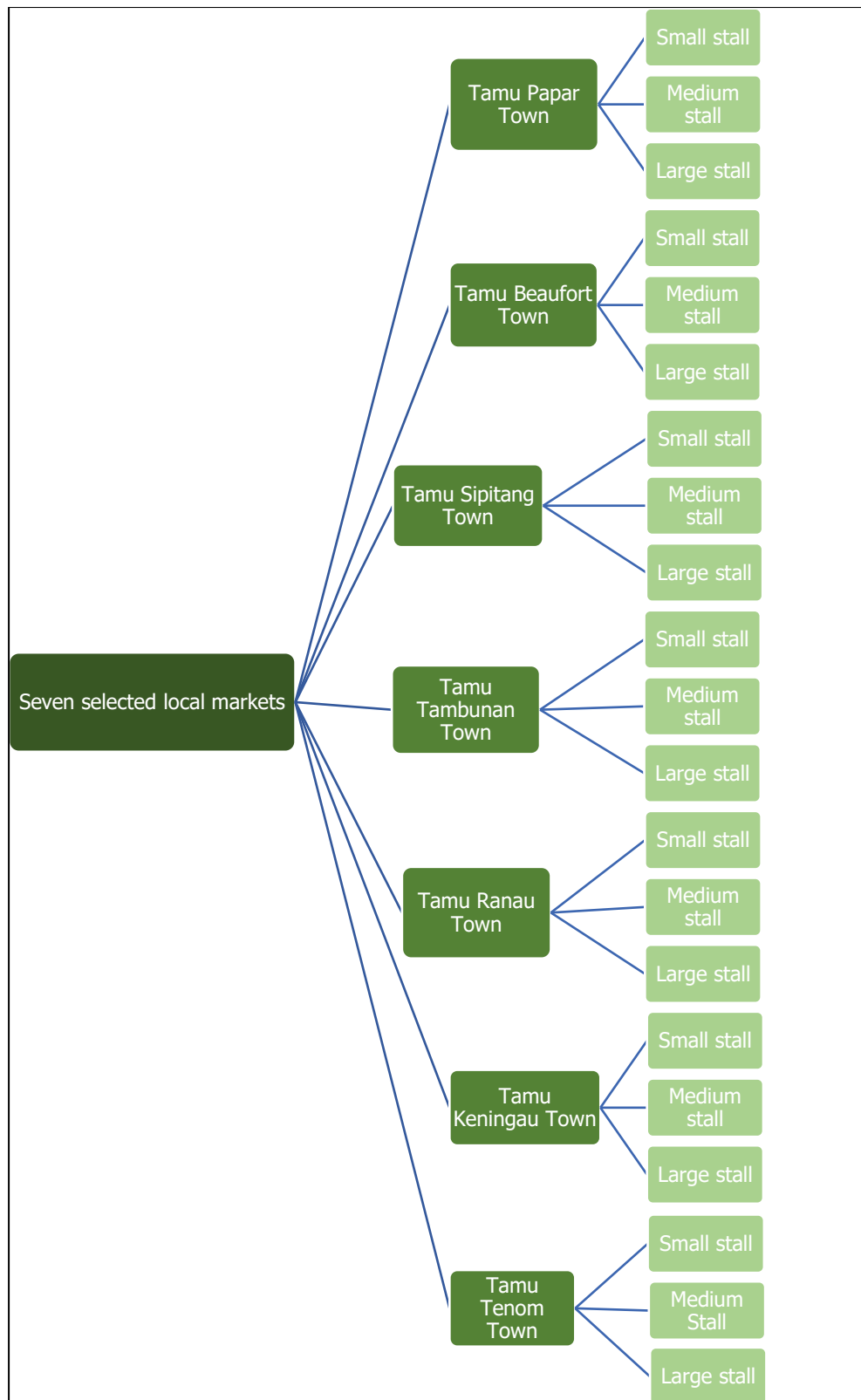


Figure 2. The sampling techniques used for selecting respondent.

ii. Marketing and trading survey using semi-structured questionnaire

A reconnaissance survey was done at the field (*Tamu*) prior to the finalization of the questionnaire to validate that the questions can fulfil the research objectives. Questionnaires by Kodoh (2006) and Kodoh *et al.* (2009) were modified and used in this study. The completed questionnaires from the interviewed respondents were analyzed. The questionnaire was divided into four categories: 1) demographic information, 2) MPs information, 3) marketing pattern and chain, and 4) profit from

MPs trading. MPs information includes their medicinal values, species and family names, product types, part utilized and collection place. Marketing pattern define by the seasons or month in which MPs sold the most. A marketing chain refers to the supply chain of the MPs from the point of origin to the customers.

iii. Observation

The observation was done simultaneously during the questionnaire survey. The atmosphere and dynamics of the MPs marketing and trading at the *Tamu* were observed, recorded and photographed during the field survey.

Data Analysis

The most traded MPs are calculated and analyzed using descriptive analysis. Besides, the sellers' profit margin was calculated using descriptive analysis concept fundamental. The profit margin calculation was as follows (Profit Margin Analysis, 2011).

$$\text{Profit margin} = \frac{\text{income} - \text{cost}}{\text{cost}} \times 100\% \quad (1)$$

The marketing chain and pattern were determined using the data from the answered questionnaire, and the diagram of the marketing chain was illustrated.

RESULT AND DISCUSSION

Surveyed Sampling

A total of 64 respondents were guided interviewed using the semi-structured questionnaire (Table 1). Each one of the respondents only represents one stall at one *Tamu*. Based on the interview done, *Tamu* Tambunan has highest frequency of respondents with 14 sellers and *Tamu* Papar has the lowest with 6 sellers. The difference of sellers' frequency may be explained by the popularity of the *Tamu*. Tambunan, Keningau, and Sipitang are parts of tourism attraction place. Therefore, their respective *Tamu* has more visitor and tourist which led to more customers. One MPs stall at *Tamu* Papar was closed and moved to *Tamu* Tambunan as the profit gained is higher.

Table 1. Frequency of respondents in seven (7) *Tamu*.

<i>Tamu</i>	Frequency*	Percentage
Papar	6	9.4
Beaufort	7	10.9
Sipitang	10	15.6
Tambunan	14	21.9
Ranau	7	10.9
Keningau	12	18.8
Tenom	8	12.5
TOTAL	64	100.0

(* different traders at each *Tamu* with unrepeated respondents)

Table 2 shows the stratified classification of the respondent according to their stall size. A total of 46 (71.9%) respondents owned a small stall (<1 m³). There was no large stall (>3 m³) at any of the *Tamu*. Most of the respondents (46 sellers) marketed their product only using the small stall. Only 18 respondents have medium size stall medium (>1 m³ <3 m³). The MPs product are sold in small quantities and small doses are enough for each use. For example, a packet of *Raja kayu* at

approximately 100 gram can be used for two months per person. Another example is *Mahkota dewa*, only a small proportion is enough to remedy the ailments.

Table 2. Number of respondents according to stall size at each *Tamu*.

<i>Tamu</i>	Large stall		Medium stall		Small stall		Total	%
		%		%		%		
Papar	0	0	1	1.6	5	7.8	6	9.4
Beaufort	0	0	3	4.7	4	6.3	7	10.9
Sipitang	0	0	3	4.7	7	10.9	10	15.6
Tambunan	0	0	5	7.8	9	14.1	14	21.9
Ranau	0	0	1	1.6	6	9.4	7	10.9
Keningau	0	0	3	4.7	9	14.1	12	18.8
Tenom	0	0	2	3.1	6	9.4	8	12.5
TOTAL	0	0	18	28.1	46	71.9	64	100.0

Demographic and Socio-economic Information

The dominant gender as sellers in *Tamu* was male (67.2%) and only 32.8% was female. However, its acceptance among womenfolk as a way of earning steady income is increasing (Sheng, 2001). The most common age among the sellers was higher than 50 years old with 38 respondents (59.4%), there was no respondent below than 35 years old. This situation might be explained by the general perception among the youth that other line of works such as civil servant has better compensations, stable income every month and non-tangible benefits such as health insurance (Subrat, 2002). Besides, according to Smadiyah (2003), the younger generation of Sabah is more inclined to work in a field that demand less labor-intensive activities.

The highest percentage of education level was the informal education with 34.4 % while the lowest was PMR with 14.1%. The highest frequency of education level was the informal education. This trend can be related to the fact that the 61.3% of the respondents were above 50 years old. Back in the days, people did not have the chances and facility like nowadays. This result may stem from poverty and a lack of awareness of the importance of education among their parents. Rural people did not have the means or knowledge to provide access to higher education for their children. They tend to depend on the sales of MPs or other forest produce as a means of livelihood (Kulip, 2003). Besides, they are more interested in following the steps of their forefather of continuing the business on selling forest produce based on the sense of familiarity (Sumner, 2000).

There were nine ethnicities documented through the interview: with respondents, namely, Rungus, Kadazan, Murut, Malay, Bruneian Malay, Dusun, Bajau, Lundayeh, and Bisaya. The most common ethnic among the respondents was the Murut (26.6%) followed by Dusun (23.4%) and Kadazan (21.9%). The least common ethnic found among the respondents was Bisaya (1.6%). Similar results were found by Kodoh *et al.*, (2009) in selling at *Tamu* in Sabah.

Most sellers (51.6%) had an income of RM1001 to RM 2000 per month, while 21.9% of the sellers have income higher than RM2000 per month and 26.6% have income between RM500 to RM1000 per month. The income level of the respondents at each *Tamu* differ between and within one another. The sellers that gained above RM2000 income are from *Tamu* Tambunan. Based on observation, the market competition among the MPs sellers at *Tamu* Tambunan is more intense as there are more sellers than

the other six *Tamu*. The sellers at *Tamu Tambunan* are more creative in marketing their products. Some sellers combined several MPs into one and marketed them as a multipurpose MPs product. Besides, to compete, they also in the urge to find the scarce MPs and introduce them to the market. Their efforts made them gain steady and profitable income even with the intense competition and reached maximum profit. Most of the respondents (56.3%) rely on MPs trading as their primary income compared to agriculture (21 respondents) and seven respondents relied on other source of income. The number of household members under the respondents' responsibility can drive them to gain more income. Most of the respondents that gain income higher than RM2000 have seven to nine household members. These differences can explain that MPs trading were not as vigorous at *Tamu Papar* and *Tamu Ranau* as compared to *Tamu Tambunan* and *Tamu Keningau* which had led to less MPs seller and sales. Shackleton *et al.* (2007), argue that local markets for non-timber forest products (NTFPs) such as medicinal plants are important especially for poor people. The character of local markets could increase the value of forest for NTFP (Vuola, 2013), improve the price bargaining power of locals, and provide an avenue for villagers to sell their products.

Medicinal Plants Demand and Supply

Based on this study, 42.2% of the respondents mentioned that the MPs were collected from tropical forests. The primary sources of MPs in Sabah were plants growing wild in the primary or secondary forest (Kodoh *et al.*, 2009). The other 35.9% was collected from their surrounding villages, either planted or naturally grown. Our result is supported by Kulip (1997) that some commonly used plants are planted around houses. Another 14 respondents (21.9%) are unaware of MPs' source, and only the MPs availability is essential. The vital role of MPs in the rural people's life made them grow MPs in their backyard. The situation was similar throughout the tropics area. People utilized NTFPs within the household and traded them for money and other products locally (Kodoh *et al.*, 2009; Tiwari, 1994). This indicates differences in demand and commercialization of MPs in Sabah (Aziz, 2004).

The scarcity of MPs can easily be overcome by sustainably cultivating more MPs species and supporting research. The rare, valuable MPs and their medicinal values should be recorded for future research. Studies that engaged in mapping the regional popular culture might favour certain medicinal species for further studies (Bolson *et al.*, 2014). So that MPs are not left unnoticed and forgotten by the younger generations. The MPs in high demand and those that are endangered by loss should be given attention. These MPs are the ones that should be studied in advance to find out the effectiveness on the clinical level, they can be marketed on the international level.

There are 53 species of MPs were identified in all the seven *Tamu*. Every species has a different frequency of appearance at each *Tamu*. Their local name, scientific name, family, and partly utilized were recorded in Table 3.

Table 3. Medicinal Plants local name, scientific name, family, and part utilized.

No.	Local name	Scientific name	Family	Part Utilized
	Akar			
1	embun/malam	<i>Ageleae macrophylla</i>	Conneraceae	Roots
	Akar			
2	mengkudu	<i>Morinda citrifoliaa</i>	Rubiaceae	Leaf, fruit, root
	Asam			
3	aroi/gelugor	<i>Garcinia atriviridis</i>	Clusiaceae	Fruit
4	Bawang hutan	<i>Scorodocarpus borneensis</i>	Olaceae	Rhizome

Table 3. Medicinal Plants local name, scientific name, family, and part utilized (*cont.*).

5	Binuang Buah	<i>Octomeles sumatrana</i>	Datisceae	Bark, wood chip
6	mentayang	<i>Caesalpinia bonduc</i>	Leguminosae	Fruit
7	Bulitotok	<i>Sida acuta</i>	Malvaceae	Bark, roots
8	Daun pinang	<i>Areca catechu</i>	Arecaceae	Leaf and nut
9	Dukung anak	<i>Phyllanthus niruri</i>	Phyllanthaceae	Bark
10	Durian belanda	<i>Annona muricata</i>	Annonaceae	Fruit
11	Gangon	<i>Artabotrys roseus</i>	Annonaceae	Fruit
12	Getah jadam	(na)	(na)	Resin
13	Gingor	<i>Spatholobus sp.</i>	Leguminosae	Roots
14	Ginseng	<i>Renellia borneensis</i>	Araliaceae	Rhizome
15	Halia	<i>Zingiber officinale</i>	Zingiberaceae	Rhizome
16	Halia merah	<i>Zingiber sp.</i>	Zingiberaceae	Rhizome
17	Jerangau merah	<i>Boesenbergia stenophylla</i>	Zingiberaceae	Rhizome
18	Kacip fatimah	<i>Labisia pumila</i>	Primulaceae	Leaf, Seed
19	Kamunting	<i>Lochnera rosea</i>	Apocynaceae	Bark, roots
20	Kayu jati	<i>Tectona grandis</i>	Lamiaceae	Wood chip Bark, wood chip
21	Kayu panas	<i>Goniothalamus roseus</i>	Annonaceae	Bark, wood chip
22	Kayu putih	<i>Nelaleuca leucadendra</i>	Myrtaceae	Bark, wood chip
23	Kelapa	<i>Cocos nucifera</i>	Aracaceae	Fruit Bark, wood chip
24	Kemangi	<i>Oscimum basilicum</i>	Lamiaceae	chip
25	Keruing	<i>Dipterocarpus kerri</i>	Dipterocarpaceae	Bark
26	Kokos	<i>Dichapetalum gelonioides</i>	Dichapetalaceae	Leaves
27	Kulempiau	<i>Amarydium medium</i>	Aracaceae	Leaf
28	Langir	<i>Albizia saponaria</i>	Fabaceae	Fruit
29	Lemon	<i>Citrus limon</i>	Rutaceae	Fruit
30	Limau kasturi	<i>Citrus microcarpa</i>	Rutaceae	Fruit
31	Limau purut	<i>Citrus hystrix</i>	Rutaceae	Fruit
32	Lingzi	<i>Ganoderma sp.</i>	Ganodermaceae	Roots
33	Lintotobu	(na)	(na)	Rhizome
34	Mahkota dewa	<i>Phaleria macrocarpa</i>	Thymelaeaceae	Fruit, seeds
35	Mas cotek	<i>Ficus deltoidea</i>	Moraceae	Leaf
36	Misai kucing	<i>Orthosiphon stamineus</i>	Moraceae	Leaf
37	Pakodita	<i>Alphitonia excelsa</i>	Rhamnaceae	Leaf
38	Panggi	<i>Pangium edule</i>	Flacourtiaceae	Leaf

Table 3. Medicinal Plants local name, scientific name, family, and part utilized (*cont.*)

39	Peria hutan	<i>Momordica sp.</i>	Cucurbitaceae	Fruit
40	Pokuntiou	(na)	(na)	Wood chip
41	Raja kayu	<i>Koompassia malaccensis</i> <i>Koordersiodendron</i>	Leguminosae	Wood chip
42	Ronggum	<i>pinnatum</i>	Anacardiaceae	Roots
43	Rosok	<i>Syzygium sp.</i>	Myrtaceae	Fruit
44	Samsan	<i>Andrographis paniculata</i>	Acanthaceae	Leaves, Roots Grinded
45	Sapang	<i>Caesalpinia sappan</i>	Leguminosae	woodchip
46	Semambu/neem	<i>Azadirachta indica</i>	Meliaceae	Leaf
47	Serai wangi	<i>Cymbopogon nardus</i>	Poaceae	Rhizome
48	Stevia Sungkang	<i>Stevia rebaudiana</i>	Asteraceae	Leaf, Seed
49	seribu	<i>Diospyros foxworthyi</i>	Ebenaceae	Fruit
50	Tampan merah	<i>Xylocarpus granatum</i>	Meliaceae	Roots
51	Tapako	<i>Drynaria sp.</i>	Polypodiaceae	Fronde
52	Tongkat ali	<i>Eurycoma longifolia</i> <i>Helminthostachys</i>	Simaroubaceae	Shoot, Root Leaves,
53	Tunjuk langit	<i>zeylanica</i>	Ophioglossaceae	Rhizomes

The high frequency of MPs indicates high demand among the consumers. Table 4 below shows the complete frequency of all MPs at the involved *Tamu*. The highest frequency is Kayu Panas (98.4 %), followed by Mas Cotek (95.3%), Raja Kayu (93.8%), Jerangau Merah (87.5%) and Halia Merah (85.9%). The forms of marketed MPs according to their species with unprocessed raw form is the most marketed (69.5%), followed by unprocessed raw with protective packaging (18.6%), then secondary processing with protective packaging (10.2%) and other forms (1.7%). Saha and Sundriyal (2012), reported that the profit from NTFPs e.g. medicinal plants could be increased significantly through semi-processing and grading. Awono *et al.* (2013) highlighted that adding value and efficient operation through simple equipment can boost production, speed up processing times and reduce losses. Product packaging can also make a significant difference in price and quality.

Table 4. MPs and their frequency of marketed at *Tamu*.

No.	Local name	Scientific name	Frequency	%
1	Kayu panas	<i>Goniothalamus roseus</i>	63	98.4
2	Mas cotek	<i>Ficus deltoidei</i>	61	95.3
3	Raja kayu	<i>Koompassia malaccensis</i>	60	93.8
4	Jerangau merah	<i>Boesenbergia stenophylla</i>	56	87.5
5	Binuang	<i>Octomeles sumatrana</i>	55	85.9
6	Halia merah Akar	<i>Zingiber sp.</i>	55	85.9
7	embun/malam	<i>Ageleae macrophylla</i>	51	79.7
8	Sapang	<i>Caesalpinia sappan</i>	49	76.6
9	Akar mengkudu	<i>Morinda citrifolia</i>	46	71.9
10	Mahkota dewa	<i>Phaleria macrocarpa</i>	46	71.9

Table 4. MPs and their frequency of marketed at Tamu (cont)

11	Stevia	<i>Stevia rebaudiana</i>	44	68.8
12	Kayu putih	<i>Nelaleuca leucadendra</i>	39	60.9
13	Asam aroi/gelugor	<i>Garcinia atriviridis</i>	37	57.8
14	Kelapa	<i>Cocos nucifera</i>	36	56.3
15	Serai wangi	<i>Cymbopogon nardus</i>	35	54.7
16	Langir	<i>Albizia Saponaria</i>	31	48.4
17	Misai kucing	<i>Orthosiphon stamineus</i>	28	43.8
18	Kacip fatimah	<i>Labisia pumila</i>	27	42.2
19	Kokos	<i>Dichapetalum gelonioides</i>	25	39.1
20	Limau purut	<i>Citrus hystrix</i>	24	37.5
21	Kemangi	<i>Oscimum basilicum</i>	23	35.9
22	Sungkang seribu	<i>Diospyros foxworthyi</i>	23	35.9
23	Kayu jati	<i>Tectona grandis</i>	19	29.7
24	Halia	<i>Zingiber officinale</i>	18	28.1
25	Tunjuk langit	<i>Helminthostachys zeylanica</i>	18	28.1
26	Lemon	<i>Citrus limon</i>	14	21.9
27	Ginseng	<i>Renellia borneensis</i>	13	20.3
28	Tongkat ali	<i>Eurycoma longifolia</i>	13	20.3
29	Keruing	<i>Dipterocarpus kerri</i>	11	17.2
30	Samsan	<i>Andrographis paniculata</i>	11	17.2
31	Buah mentayang	<i>Caesalpinia bonduc</i>	9	14.1
32	Tampan merah	<i>Xylocarpus granatum</i>	9	14.1
33	Limau kasturi	<i>Citrus microcarpa</i>	8	12.5
34	Lingzi	<i>Ganoderma sp.</i>	8	12.5
35	Ronggum	<i>Koordersiodendron pinnatum</i>	8	12.5
36	Daun pinang	<i>Areca catechu</i>	7	10.9
37	Getah jadam	(na)	7	10.9
38	Kamunting	<i>Lochnera rosea</i>	7	10.9
39	Rosok	<i>Syzygium sp.</i>	7	10.9
40	Kulempiau	<i>Amarydium medium</i>	6	9.4
41	Panggi	<i>Pangium edule</i>	6	9.4
42	Bawang hutan	<i>Scorodocarpus borneensis</i>	4	6.3
43	Tapako	<i>Drynaria sp.</i>	4	6.3
44	Dukung anak	<i>Phyllanthus niruri</i>	3	4.7
45	Gangon	<i>Artabotrys roseus</i>	3	4.7
46	Peria hutan	<i>Momordica sp.</i>	3	4.7
47	Bulitotok	<i>Sida acuta</i>	2	3.1
48	Gingor	<i>Spatholobus sp.</i>	2	3.1
49	Pakodita	<i>Alphitonia excelsa</i>	2	3.1
50	Semambu/neem	<i>Azadirachta indica</i>	2	3.1
51	Durian belanda	<i>Annona muricate</i>	1	1.6
52	Lintotobu	(na)	1	1.6
53	Pokuntiou	(na)	1	1.6

Marketing Chain and Pattern of Medicinal Plants at Tamu

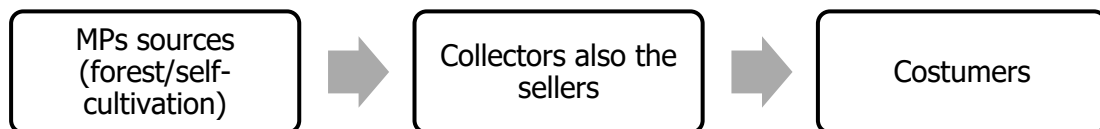
Three patterns of marketing chains were identified. The marketing chain differs from the supply chain regarding consumer(s) presence at the end of the marketing chain. One without consumer(s) is

called the supply chain. The most common supply chain at 53.1% was the respondents (sellers) buy the MPs from collectors. The second most common (29.7%) was the respondents (sellers) cum collectors of the MPs at *Tamu*. The supply chain that involved middleman was only 17.2%. The sellers were not registered with any herbal practitioner's association. Table 5 shows the supply-chain pattern, and Figure 3 shows the marketing chain pattern of medicinal plants of the *Tamu*.

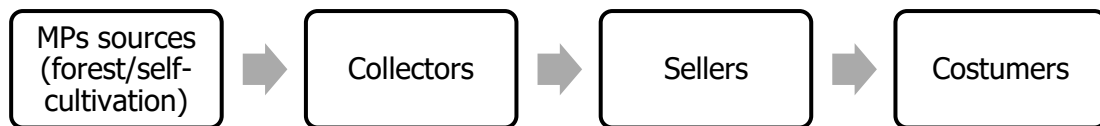
Table 5. Marketing chain of Medicinal Plants to sellers at all seven *Tamu*.

Tamu	Marketing Chain					
	Respondents	%	Collectors	%	Middleman	%
Papar	0	0.0	3	4.7	3	4.7
Beaufort	2	3.1	5	7.8	0	0.0
Sipitang	4	6.3	5	7.8	1	1.6
Tambunan	4	6.3	9	14.1	1	1.6
Ranau	2	3.1	3	4.7	2	3.1
Keningau	4	6.3	6	9.4	2	3.1
Tenom	3	4.7	3	4.7	2	3.1
TOTAL	19	29.7	34	53.1	11	17.2

i) Pattern Marketing chain 1



ii) Pattern Marketing chain 2



iii) Pattern Marketing chain 3



Figure 3. Marketing pattern of medicinal plants at the seven (7) *Tamu*.

A total of 53.1% of respondents bought the MPs from the collectors. Usually, each MPs is collected from different collectors from different villages. Thus, the respondent (seller) can reduce cost due to the absence of the middleman. The respondent can buy the MPs in their favour or by market demand without the control of the middleman. A clear understanding of supply issues and the driving factors of MPs demand and size is crucial in marketing (Dudley & Stolton, 2004).

While 17.2% of the respondents depend on a middleman to obtain MPs. The middleman usually increases the value of MPs through processing, packaging in small doses, and pack as a mixture of medicinal herbs (Bechu, 2008). The price of the MPs is usually higher due to the modern packaging, transportation costs, and middleman surcharge expenses (FAO, 2001). Most respondents that source

their MPs from middleman did not sell MPs as the main income. They were selling multiple products such as agricultural produce, wild edible plants, clothing, and homeware. The respondents did not have time to collect the MPs from the cheapest source and relied on the middleman. The middleman is approachable and provides personal services. Occasionally, the respondents were doing the middlemen a favor by helping to market the MPs at the *Tamu*.

The marketing chain has been changing for the past years resulted from several factors such as the sellers try to cut off the extra cost, depleting in MPs source make the middleman can't buy in bulk from the collectors and sellers starting to grow their own source of MPs. Based on the results, 29.7% of the respondents collected the MPs source by themselves and sell it at *Tamu*. Some commonly used plants are cultivated around houses (Kodoh, 2005; Kulip, 1997).

Net Profit Margin of Respondents from Medicinal Plants Trading at Tamu

The highest and lowest monthly profit margin of selling medicinal plant products by the local traders were 78.6% (RM1100/USD270.43) and 22% (RM330/USD81.13) respectively, with an average monthly profit margin of 60.3% (RM924.06/USD227.18). The highest profit margin was from a respondent of *Tamu* Beaufort and another one from *Tamu* Tambunan. Maximum income was achieved when sellers collected the MPs grown and from other collectors instead of the middleman. The lowest profit margin is 22% from a seller of *Tamu* Keningau. The sellers that gained a low-profit margin usually involved in other trades and have multiple sources of income. Therefore, they were not motivated to improve their MPs trading profit. Selling MPs is considered a side economic activity.

CONCLUSION

Fifty-three Medicinal Plants (MPs) species were marketed at the seven *Tamu*. The commonly marketed species were Raja kayu (*Koompassia malaccensis*), Mas cotek (*Ficus deltoidea*), Kayu panas (*Goniothalamus roseus*), Jerangau merah (*Boesenbergia stenophylla*), and Halia merah (*Zingiber* sp.). Cultivation of these plants should be intensified to meet the high demand and due to reduced wild populations. Three patterns of the marketing chain were identified. The middleman was no longer a vital factor in MPs marketing. The seller has resorted to cultivating the MPs instead of harvesting from the wild to increase production. The profit margin of the sellers shows that the trading of MPs can bring a considerable profit if using the best marketing strategies and reduce cost. The average profit margin of all the sellers at all *Tamu* is 60.3%. This statement brings into light that the MPs are not just important in health but economics. The locals are absolutely depending on MPs trading as their source of income. This study showed that medicinal plant products have a potential substantially profit margin, indicating profitable sales for the local traders.

ACKNOWLEDGEMENTS

The authors wished to acknowledge Universiti Malaysia Sabah for funding this project (Project Code SBK0138-STWN-2014).

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