

Gender Participation in Palm Sugar Processing in Kolaka District of Southeast Sulawesi

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Abstract: - The study aimed to assess gender involvement in palm sugar (*gula aren*) processing. The study was carried out in a palm sugar producing village in Wolo subdistrict, Kolaka district, Southeast Sulawesi. Twenty palm sugar farmer-processors living in the village were selected as respondents. Data collection was done using questionnaire-based interview and Key Informant Interview (KII) methods. Data were analyzed using descriptive statistics as well as scoring method based on five-point Likert Scale responses. Study results showed that women are not involved at all in tapping preparation, tapping, and sap filtering. Women are involved in cooking, stirring, molding, and marketing, but their level of participation is much lower than that of men. Wrapping solid sugar is the only practice where women's involvement is higher than men's. A grand mean participation index of 1.9 for women and 4.4 for men indicated that palm sugar processing is a men-dominated livelihood. Next studies need to examine whether this status of men-dominated livelihood also applies in other sugar palm growing areas within the province. The study recommended that women should be motivated and encouraged to engage more in home-based activities of palm sugar processing.

Key-Words: gender, participation, palm, palm sugar, processing, Sulawesi

Received: March 13, 2019. Revised: November 28, 2019. Accepted: January 10, 2020.
Published: January 15, 2020.

1 Introduction

Agriculture is the backbone of the Indonesian economy. Despite its decreasing contribution to the Gross Domestic Product (GDP) [1], it is still the essential source of food and raw materials, foreign earnings, employment, and livelihood. Agriculture can function as an important engine of growth and a viable intervention strategy for poverty alleviation [2]. However, the sector could be underperforming partly because of the presence of constraints for women to have access to productive resources that reduce their productivity [2]. Alleviation of these constraints will lead to the realization of women's roles as farmers, laborers, and entrepreneurs. It will also place them in a more significant position in the development of agriculture and the rural economy.

Despite the consistent efforts of the Government of Indonesia (GoI) to achieve food self-sufficiency [3,4] as many as 58 districts are still highly vulnerable to food insecurity [5,6], and 25.95 million people are still living below the poverty line [7]. Women are known to be generators of food and income for their families, but at the same time, they are vulnerable to poverty. To improve food security and alleviate poverty, the GoI has adopted various programs, such as rice for the poor [5], micro-credit for the poor, and scholarships for the children from

low-income families. Promoting agro-industry is regarded as a means to contribute to these efforts [8,9]. The GoI itself has committed to the empowerment of women in various fields, including in agriculture and agro-industry.

Women's participation in agriculture and agroindustry can help increase household income, improve rural livelihood, and ensure food security. However, women are usually less able than men to involve in productive activities because they should also involve in reproductive and social activities. In most communities, women are responsible for most of the household chores and child-rearing activities and are also involved in social activities, the rearing of small livestock, and cultivation of subsistence food crops [2]. Doing child care and household chores can be extremely time-intensive, and if included in time allocation, women work significantly than men [2].

Despite being not a strategic commodity in the province of Southeast Sulawesi [10], sugar palm (*aren*) helps employment and generate income for many households in palm growing villages. It is a multi-purpose tree where the human can use almost all of its parts for various purposes. Palm sugar (*gula aren*) is the most essential product obtained from sugar palm (*Arenga pinnata* (Wurmb) Merr.).

Palm sugar is made from the palm sap through a series of processing operations, namely tapping preparation, tapping, cooking, stirring, and molding [11]. Tapping preparation and tapping are done at the location where the palm trees grow, such as forest and dry land, while cooking, stirring, and molding take place at processors' home or homestead.

Numerous studies about gender involvement in agriculture and agroindustry have been carried out, such as in seaweed aquaculture [12], soybean production [13], crop production and management practices [14], livestock activities [15], cowpea storage activities [16], palm oil production [17], and cassava production and processing [18]. Likewise, there have been many studies on various aspects of palm sugar [19-23]. However, information about gender involvement in palm sugar processing is lacking. The present study is conducted to fill the gap to assess men's and women's participation in palm sugar processing.

2 Materials and Methods

The study was carried out in Tolowe Ponre Waru, Wolo Subdistrict, Kolaka District, Southeast Sulawesi. The study location was selected purposively because the village has been one popular palm sugar producing area in Kolaka District. The size of the village is 3,954 ha, with its population accounting for 1,829 persons. The village is situated 52 km from Kolaka, the district capital, and 226 km from Kendari, the provincial capital. Villagers who depend on agriculture as their main livelihood account for 76%. Annual rainfall ranges from 1,441 to 2,343 mm with an average of 1,885 mm. Temperature ranges from 28-32 °C.

The survey was conducted in May-June 2015. Respondents consisted of 20 household heads who were palm sugar processors living in the village. Data were collected through questionnaire-based interviews and Key Informant Interviews (KIIs). In most of the interviews, both husbands and wives were present, thus providing consensual responses. KIIs were conducted with three selected individuals to supplement information obtained from questionnaire-based interviews. Respondents were asked to rate the level of their involvement in each stage of palm sugar processing operations using a Likert scale of 1-5. The value of 1 meant "never," 2 "rarely," 3 "sometimes," 4 "often," and 5 "always." Based on the responses received, the mean score for each of the activities and the grand mean score for all the activities were calculated. The grand mean score was divided by the number of activities to

determine the level of involvement of men and women in palm sugar processing. Based on the mean score and grand mean score, the participation index was determined using a 3-point scale, namely, "low" (1.00-2.33), "fair" (2.34-3.67), and "high" (3.68-5.00).

3 Results and Discussion

Table 1 presents the level of gender participation in all stages of palm sugar processing. Men are predominately involved in all activities with the level much higher than women except in wrapping/packaging. Women never involved in tapping preparation, tapping, and filtering of palm sap. The grand mean score of men's involvement is 4.4, which is included in the high-level category. The grand mean score for women is 1.9, which is under the category of "low" level. The grand mean score indicated that palm sugar processing is men's work.

Table 1. Mean scores of men's and women's involvement in palm sugar processing

Activities	Location	Men		Women	
		Score	Cate-Gory	Score	Cate-gory
Preparation	Forest/dryland	4.1	High	1.0	Low
Tapping	Forest/dryland	5.0	High	1.0	Low
Filtering	Home	4.5	High	1.0	Low
Cooking	Home	4.9	High	2.6	Fair
Stirring	Home	4.1	High	2.7	Fair
Molding	Home	4.9	High	1.6	Low
Wrapping	Home	2.4	Fair	3.5	Fair
Marketing	Home/market	4.9	High	1.9	Fair
Grand mean score		4.4	High	1.9	Low

The non-involvement of women in tapping preparation and tapping is because those operations are labor-intensive, hard, and risky. Before tapping, some preparatory activities should be done, namely to clean sugar palm trunks and to open its fronds. Beating and preparing 20 inflorescence stalks take about 2.5 hours each day. Before tapping the sap, a tapper needs to go through several stages, namely, to climb the tree using a long ladder, to open the bark, to beat and swing the peduncle, and to cut the peduncle [24]. Tapping should be done regularly twice a day. A healthy person might be able to tap 12-16 trees based on an 8-hour working day [25], but in practice, one person can rarely tap more than ten trees. Tapping the inflorescence is risky as the tapper needs to climb the palm tree to slice and bring down the previously collected sap. Tapping must be performed everyday; otherwise the flow of the sap will diminish quickly as t issue healing occurs [25]. Transportation of the sweet sap also

requires a lot of time and energy. A small amount of lime is added into the sap to slow down sap fermentation [11].

The non-involvement of women in tapping preparation and tapping is common in all palm sugar processing areas. This situation might be due to cultural norm common in Indonesia that women are not allowed to climb a tree. There is also a common perception that men should do harder work which involves physical strength. Kameo [26] reported that men are fully involved in tapping sap from the coconut tree. Martini *et al.* [27] stated that in Batang Toru, North Sumatera, men dominated the sugar palm based management system, especially in tapping. Likewise, in Hulu Selatan District, tapping is entirely dominated by men [22]. A similar situation is also reported to occur in Lebak District, Banten [28] and West Pasaman, West Sumatera [29].

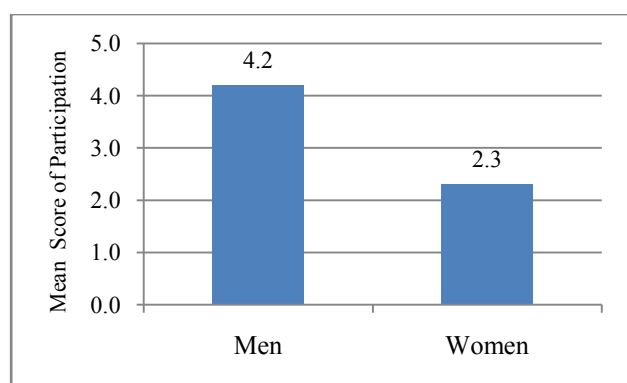


Fig. 1. Mean score of men's and women's involvement in home-based activities of palm sugar processing.

Filtering, cooking, stirring, and molding are done in the kitchen of farmer-processors' houses or in the shed at the homestead. Even in these home-based activities, men are more actively involved than women (Fig. 1), as indicated by the mean score of men's involvement (4.2) which is much higher than that of women's (2.3). Filtering of collected palm sap is done using a plastic fine mesh strainer or other filtering tools to get the clean juice free from dirt, extraneous small debris, or other contaminants. The filtered palm sap is poured into a big wok and is heated on the wood-fired three-stone stove for 4-6 hours at $>100^{\circ}\text{C}$. When the liquid starts boiling, it should be stirred continuously using a wooden spoon until it starts crystallizing and has a typical aroma. The thickened sugar mash is then poured into molds, usually a half coconut shell. The last stage of this palm sugar making process is to wrap the solid palm sugar. As can be seen in Table 1, the mean scores of men's involvement in

filtering, cooking, and stirring are 4.5, 4.9, 4.1, and 4.9, which are higher than the mean scores of women's involvement.

Less involvement of women in *aren* sugar processing in the study village, even for those stages done at home, is noteworthy. According to respondents, the main reason is the hard and laborious nature of cooking. Cooking takes up to six hours to complete, and the women specifically referred to the stirring process as hard. The continued stirring between ten and fifteen minutes to avoid burning and to have well-mixed liquid is said to require a lot of strength and considerable efforts. The same is also said with maintaining the firing, which used large logs of fuelwood. However, in other areas, women are responsible for sap cooking [23,26,29,30]. Besides, in the production of some crops, women are involved in practices that require considerable effort and time. Msuya and Hurtado [12] reported that women are involved more than men in seaweed farming in most developing countries, including in hands-on farming activities. Women participate more than men in the production and processing of cassava, so that cassava is even regarded as women's crop [18]. In Chili, women have taken up men's work in addition to their own during the period of male seasonal migration, and therefore, can adapt well to the hard physical work in the salmon industry [31]

Less involvement of women in cooking, stirring, and molding in the study village agrees to findings of Febriyanti *et al.* [28] and Radam and Rezekiah [22]. In Lebak District of Banten Province, all activities of palm sugar processing, including the cooking process, are performed by men [28]. Likewise, all palm sugar producers in Hulu Selatan District are men [22]. However, other studies revealed that women are in charge of the cooking processes in palm sugar processing. For example, Kameo [26] reported that women cook palm sap while doing household chores. In Borongtala village of Jeneponto District, South Sulawesi, women spent 18.37 days per month to cook the sap [23]. In Buluh Awar Village, North Sumatera Province, generally, women are responsible for all processing activities conducted at home [30]. Erdawati and Yurasti [29] noted that women are responsible for cooking the sap and other home-based activities. Women must cook the sap on the same day to prevent quality loss [32].

Wrapping is the only stage where women's involvement is higher than that of men. Materials used for wrapping the sugar are mostly obtained from the local area, namely, teak leaves, banana

leaves, and palm leaves. Sometimes processors used plastic to wrap the sugar.

Marketing is the delivery of palm sugar to intermediaries or consumers' points. In the study village, again, men are predominantly involved in the marketing process of produced palm sugar. Men are fully involved in selecting middlemen or buyers, negotiating the price or others with buyers, and transporting the products to the market (if sold at the market). In fact, in most cases, it is the middlemen who come to the processors' houses to pay and take the sugars. Women are also involved but with the low participation index, meaning that they only support their partner (husband) in marketing operation.

Given the light and simple operation of the marketing process, less-involvement of women in the marketing seems to disagree with the previous justification from respondents that they did not participate due to the drudgery and laborious nature of the work. It seems that being involved or not is also determined by habits, or by norms and values about what constitutes male and female work. In this regard, the people in the study village might have regarded palm sugar processing as 'men's work.'

Another activity that supports palm sugar processing is fuelwood collection. Palm sugar processing requires a high quantity of fuelwood [11], which is partly met through collection of dead and fallen trees and wood from the forest, farmland, fallow land, and home garden. It was revealed from interviews with respondents that men dominate fuelwood collection for sap cooking, which usually uses a bigger size of logs and branches. Women are also involved in fuelwood collection but are limited in terms of fuelwood size and locations. In this regard, the use of fuel-efficient stoves can reduce firewood requirements, indoor pollution, and the time required for cooking.

Less-involvement of women in home-based palm sugar processing activities needs careful examination as they have an implication on the improvement of household income and rural economy. It has been shown that drudgery and the laborious nature of the work is perceived to be part of the reason, but this might apply only to the study village as women in other areas are doing the work. At the same time, local customs and attitudes that impose domestic workloads mostly to women are certainly not the barriers to their participation since sap cooking, stirring, and molding are done at home or homestead. Based on time allocation, palm sugar processing can be considered as men's work, whereas sugar palm is regarded as men's crop.

According to Gündel [33], men raise cash and export crops as they are responsible for providing cash income to the family, while women grow subsistence crops as they are responsible for feeding the family. In the study village, this division of crop by gender holds for sugar palm as it is cash crops. However, in other popular estate crops such as cocoa, clove, pepper, and patchouli, this division of crops by gender is blurred as both men and women are involved in the tasks. Except for sugar palm, no crops in the study village are grown exclusively by women or by men.

Villagers' perception of palm sugar processing as men's work might have also related to the existence of estate crops. Kolaka District was once well-known as the production center of cocoa and clove [34,35], both of which provided high returns and prosperity to the farmers. During this period, the status of cocoa and clove as the primary source of income was formed and fostered. Other crops or livelihoods were perceived as providing additional income to the farmers. In recent years, however, there has been decreasing productivity and net returns from cocoa and clove [35,36]. Interestingly, respondents still consider cocoa and clove as their primary occupation and palm sugar processing as the provider of additional income even though palm sugar processing provides a considerable amount of net return. Accordingly, the status of palm sugar processing as a provider of additional income might have made women farmers less serious to participate in palm sugar processing; they prefer to involve in cocoa and clove production. In fact, more involvement of women in palm sugar processing activities can increase productivity and quality of the products. More importantly, more involvement of women will enable men to do other productive activities, which in turn provide more income to the households.

4 Conclusion

This study sought to assess men's and women's participation in palm sugar processing. Men fully dominate tapping preparation, tapping, and sap filtering. Women are only involved in cooking, stirring, molding, and marketing, but still in the low-level category with mean scores of participation index of 2.63, 2.68, 1.63, and 2.37, respectively. Wrapping solid sugar is the only practice where women's involvement is higher than men's. A grand mean participation index of 1.70 for women and 4.68 for men indicated that palm sugar processing is men's work. The less-involvement of women is partly due to the nature of palm sugar processing as

physically hard work, but also due to farming system and cultural norms regarding the gender division of labor. The study recommended that women should be motivated and encouraged to engage more in home-based activities of palm sugar processing. The level of gender involvement may vary according to ethnicity, household types, farming systems, agroecological zones, and socio-economical factors, so the next studies need to investigate those factors that are responsible for any gender gap, and to examine whether the status of palm sugar processing as men's work also applies in other sugar palm growing areas within the province.

Acknowledgment:

The authors are grateful to Sitti Kurniansi for her assistance in the data collection during the field survey.

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