

## Factors Affecting Women's Capacities as Traditional Sago Starch Processors in Maluku, Indonesia

Inta P. N. Damanik<sup>a\*</sup>, Siti Amanah<sup>b</sup>, Siti Madanijah<sup>c</sup>, Prabowo Tjipropranoto<sup>d</sup>

<sup>a</sup>*Pattimura University, Jl. Ir. M. Putuhena, KampusPoka, Ambon-97233, Indonesia*

<sup>b,c,d</sup>*Faculty of Human Ecology, Bogor Agricultural University, Jl. KamperKampus IPB Dramaga, Bogor- 16680, Indonesia*

<sup>a</sup>*Email: inta\_damanik@yahoo.com*

<sup>b</sup>*Email: sitiamanahasli@yahoo.co.id*

<sup>c</sup>*Email: smadanijah@yahoo.co.id*

<sup>d</sup>*Email: prabowo\_t@ymail.com*

### Abstract

The objectives of this research were to describe the capacity level of women as traditional sago starch processors and to analyze factors which affected women's capacity in processing sago starch as traditional home industry. Research was conducted in the Districts of Central Maluku and West Seram involved 204 households of sago starch processing as respondents which determined from population (416 households) by Slovin formula with degree of error 5% and drawn by simple random sampling method. Data collection was undertaken in January until April 2012. Data were analyzed using Statistical Package for the Social Science (SPSS v.20). Result showed that characteristics of social economic of traditional sago starch processor (namely age, length of time in business, informal education, motivation, family size, and individual beliefs about the social and cultural values of sago) and support from institution of agriculture extension affected personal capacity. Personal capacity affected business capacity and in the next term business capacity affected productivity. Increasing productivity will increase income. This means that the sago starch processors with higher personal capacity will do better in business.

**Keywords:** sago; sago starch processing; women's capacity

### 1. Introduction

Sago is one of the local foods in Maluku that has potential to support food diversification not only in Maluku, but also in Indonesia.

---

\* Corresponding author. Tel.: +062-813-430-50306 ; fax: - .  
E-mail address: inta\_damanik@yahoo.com

As farm diversification has potential as an economic driver in agricultural regions of the country [1], sago diversification also has many benefits, not only to household income, but also to social life of community and to support food security program. In fact, Maluku has a considerable potential for sago production; with about 31,360 hectares under sago palm and production of 119,168 tons dry starch per year, while utilization of dry starch currently is only about 24% of that total, or about 28,600 tons per year. It means over 90,000 tons of dry starch is potentially wasted in the forest every year [2] and it continues until now.

Sago starch processing in Maluku is generally done by women with individual characteristics that differ one another and using traditional technologies that handed down from parent to child over several generations. There are three traditional products of sago that are always produced, namely *sagulempeng*, *bagea*, and *serut*, but most of people, especially in towns in Maluku tend to consume new types of sago product with a different taste. This has become a new problem to traditional sago processing because according to [3] small scale producers generally lack the knowledge, information and resources to meet quality standard and formal market specifications.

This situation is certainly very unfortunate for the development of sago in Maluku, especially to revitalize sago as a local food through food diversification and to increase household income of traditional sago processor. Therefore it becomes important to increase the capacity of women as sago starch processor so could produce innovative products of sago. One reason to increase their capacity beyond the role of traditional sago starch processing is higher capacity and better skills will make them be able to expand the scale of their enterprises. In the next stage, they will be able to take advantage of market opportunities not only in Maluku, but also in the whole Indonesia. Here, change agent needed to show and give many innovative things that could make business of sago starch processing better. Based on this background, the aims of this research were to: (1) describe the capacity level of women as traditional sago starch processors, and (2) analyze factors that affect the capacity.

## 2. Methods

### 2.1. Research location

Research was conducted in the Districts of Central Maluku and West Seram with considerations that these two districts have a large potential for sago production and as sago starch processing centers in Maluku. To represent selected districts, two sub-districts were chosen by considering as centers of traditional sago starch processing for the district which one is closest to the capital district and another is farther away. The same consideration was used to choose two villages as representative of each sub-district selected. So, there were eight villages were chosen, namely Nolloth, Ihamahu, Suli, and Waai in Subdistrict of Saparua and Salahutu to represent District of Central Maluku; and Piru, Manipa, Lumolli, Iha in Subdistrict of West Seram and Huamual to represent District of West Seram.

### 2.2. Population and sample

The research population was all households that do traditional sago starch processing in the selected villages which still actively processing sago starch for at least five years before the research was conducted. Based on data from the village offices and the information collected in the preliminary research, the population was 416 households. Sample size was determined by Slovin formula [4] as follows:

$$n = N / (1 + N \cdot e^2) \text{ with:}$$

$n$  = sample size  
 $N$  = population size  
 $e^2$  = degrees of error of 1%, 5% and 10%

By choosing the degree of error 5%, then sample size was 204 households for traditional sago starch processing. Sample distribution in each village was determined proportionally based on the population size and used simple random sampling method to draw a sample. Analysis unit was the household of traditional sago starch processing where the primary respondent is the woman who processes sago and runs the business. There were five women

were not agree to be respondent in Ihamahu village, so replacement strategy was used by looked at again to the list of women as traditional sago starch processor in this village and took five of them by simple random sampling.

### *2.3. Data collection*

Data were collected from January until April 2012. To get more information, focus group discussions and in-depth interviews with a number of selected respondents, and participant observation was also conducted. There were six peoples helped to conduct interviews, to collect data, to arrange focus group discussion, and to prepare data tabulation form. Training and discussion how to understand this research and use the questionnaire was done two weeks before. This study used a questionnaire as an instrument to collect data which was designed with closed and open-ended questions. Closed questions were answered using a Likert scale, and open-ended questions was used for additional information.

### *2.4. Validity and reliability instrument*

The instrument's validity and reliability were tested through 30 traditional sago starch processors at different areas with similar conditions of respondents. Validity refers to how far an empirical measure adequately describes the real meaning of the concept under consideration [5]. Questionnaire validity measured by calculating the correlation between the scores of the items and the overall score by using Product Moment Correlation. The trial result showed that the  $r$  values greater than  $r$  tables with  $\alpha = 0.05$  (0.361), so the questionnaire was valid. Instrument reliability was tested with Alpha Cronbach. The trial result showed that coefficient reliability values were at interval 0.803 to 0.895, (greater than  $r$  table ), it means the instrument is reliable.

### *2.5. Data analysis*

Data were analyzed using descriptive statistics and Spearman Correlation. Software of Statistical Package for the Social Science (SPSS v.20) was chose to use.

## **3. Results and Discussion**

### *3.1. Women's capacity in Sago Starch Processing*

In this research, women capacities are the abilities of women processing sago starch. These capacities divided into personal capacity and business capacity.

#### *3.1.1. Personal Capacity*

Personal capacity of traditional sago starch processors was reflected by capacity to: (1) arrange business plan, (2) identify and solve problems, (3) take advantage of opportunities, and (4) maintain business continuity. Majority of traditional sago starch processors have similar levels of personal capacity. About business plan, all processors have a desire to expand business, but the problem is inability to make a business plan, including pre- and post-production planning. The only planning is to keep the business going; it means that doing business is a routine activity.

Traditional sago starch processors have various problems in processing sago starch. The main problem is increasing price additional material such as palm sugar, coconut, and walnut. There are two ways to solve these problems. First, buying those additional materials at market prices and make the selling price of the product higher. Usually processors do this to preserve the quality of products. Second, reducing additional material or decreasing size of product or package to keep the selling price constant.

The majority (62%) of traditional sago processors have medium capacity to take advantage of opportunities. It means just taking advantage of opportunities with an acceptable level of risk, for example opportunities to increase volume of product in school holidays because most students will take some sago products when they go back to their school in another place. Actually, the change in consumers' demand is an opportunity to develop business scale. In Europe, the changes in consumers' demand have forced the food industry to create and develop new products and marketing campaigns that are able to fulfill all these requirements [6], but in sago starch processing, most processors don't want to change their business arrangements include technology because they don't want to take additional risks [7], [8]. Because of that, most of them face difficulties to increase the scale of their businesses. In addition, consumers' tastes are continually expanding, not only about sense of taste, but also color, size, texture, and packing. In other words, besides price and quality, consumers also have consideration about benefit (refers to the potential benefits of product technology); health and food environmental factors (risk concerns of the technology in relation to health safety and food and environmental safety, respectively [9]). Availability of many novel food products nowadays is also a problem for sago processors to increase scale of business.

Nearly 92% of traditional sago starch processors have capacity to maintain business continuity in medium category. It was seen from business conditions that only slightly changed from the previous generation that had been running the business for decades. In other words, for sustainability, they manage business by making choices and entrepreneurial behavior [10].

### *3.1.2. Business Capacity*

There are four components to measure enterprise capacity, namely: (1) capital, (2) labor, (3) technology, and (4) marketing skills. Just over half of the traditional starch processors (52%) have business capacity in medium category. The majority (53%) of traditional sago starch processors have medium capacity to provide money as capital for the business. They generally rely on their own capital because they do not have access to sources of capital, such as banks. This is also founded by [11] in study about technology adoption and women entrepreneurial behavior in rural South Western Nigerian communities. Mostly the business of sago starch processing begin by continuing the efforts of parents or borrowing money from others to use as capital. When a business is already running, some portion of revenue can be saved as working capital.

To fulfill labor need, the majority (54%) of traditional sago starch processors have medium category. So far, there is no difficulty in getting the number of workers needed from outside or inside their family, but workers' skills need to increase. Each processor employed two or three persons.

Technology in processing sago starch was relatively simple and it was apparent in all activities from preparation of sago starch until the baking stage. All works were done by hands without tools so that the processes have a strong traditional feel. Equipment's were used continuously while it could be used and will be replaced if no longer serviceable. Besides technology of equipment, information technology related to sago processing business was also very rare. Lack of available information [7] and lack of capacity to access information become barrier to obtain the required information and hence the pace of adoption slowly.

Market availability is important to traditional sago starch processors for selling their product. A majority (64%) of processors have medium capacity to access markets. It illustrated that all of traditional sago starch processors do not have great difficulty in selling processed products. In addition, the sale price was appropriate and there was no price competition because every processor had own established customers.

The majority (65%) of sago starch processors have business productivity in medium category, as well as the aspect of quantity and quality of the products. About product quantity, 60% of processors felt satisfy because it could increase household income. There is a desire to increase output, but increasing the quantity of product means adding working capital, while the volume of demand rarely increase. So, increasing the quantity of product will be made upon request. According to [12], certain types of product's demand such as *serut* and *bagea* getting lower 40% every year because consumers were getting bored with these products.

Quality of the products is also classified in the medium category. Food products generally were not tested by National Agency of Drug and Food in Ambon, not only because the test cost is too expensive, but also most of sago processors do not know the meaning, method, or significance of the tests. The average revenue of sago starch processing is in the medium category about Rp.2,621,453 (equivalent to US\$ 262) per month. It contributed about 86% to household income.

### 3.2. Factors Affecting Women's Capacities

Not all characteristics of traditional sago starch processor affect capacity to run business, but change agent (extension worker) have important role to increase their capacity as illustrated in Table 1.

Table 1. Correlation Between Characteristics of Traditional Sago Starch Processor and the Role of Extension Worker with Personal and Business Capacities

Characteristics	Personal Capacity	Business Capacity
Age	.226**	.091
Formal education	.006	.077
Informal education	.143*	.035
Length of time in business	.205**	.069
Motivation	.163*	-.014
Family size	.154*	.099
Household's income	.030	.165*
Information access	.031	.003
The value of social function of sago	.253**	.085
The value of culture function of sago	.278**	.108
The role of extension worker	.226**	.174*
Personal capacity		.318**

\*\* : Significant at level  $\alpha = 0.01$ ;

\* : significant at level  $\alpha = 0.05$

Age, length of time in business, informal education, motivation, family size, and individual beliefs about social and cultural values of sago have positive and significant correlation with personal capacity, while the level of formal education, household income, and access to information had no effect. Household income has positive correlation with business capacity. It reflected the fact that although sago starch processing is an income source for women, the condition of the work and the process itself still reflect the traditional character of business. Improving skills in processing sago starch seem to occur along with increasing age of the processor and length of time in business. Because the sago starch business is mostly a hereditary business, the motivation of processors is not only about income, but also to preserve a culture and manage their businesses while maintaining and implementing the social and cultural values of sago. [13] also founded that motivational level had a significant correlation with capacity building. Family size affects the capacity of women in processing sago starch through the availability of family labor as a source of labor. The level of formal education is almost the same for most of sago processors so it doesn't affect capacity, but informal education have positive correlation with capacity. Similarly, the number of family dependents is almost the same and unlikely to cause any big effect on the individual's capacity.

Extension worker has positive and significant correlation with personal and business capacity, but the correlation with personal capacity higher than correlation with business capacity. It means that extension worker through the role as motivator, facilitator, and catalyst has important meaning to increase personal capacity of traditional sago starch processor instead of increasing business capacity.

All components of personal capacity positively affect the capacity of business. This means that the sago starch processors with higher personal capacity will do better in business such as raising capital, providing labor, technology, and having market access. Business capacity will not increase without good personal capacity and the role of women not only in production and consumption, but also to gain greater power over their livelihoods [14].

All elements of business capacity simultaneously has positive and significant correlation with productivity and income, but separate analysis showed that capital, labor, and technology have positive and significant correlation with productivity and income while market access has no correlation as shown in Table 2. Market access has no correlation with productivity and income because all of processors have own customers so market is not a problem. It will be a problem if the quantity of product increases.

Tabel2 Correlation Between Business Capacity with Productivity and Income of Traditional Sago Starch Processing

The component of business capacity	Productivity	Income
Capital	.273**	.294**
Labor	.219**	.194**
Technology	.201**	.236**
Market	.015	.039
Business capacity	.188**	.194**

\*\* : Significant at level  $\alpha = 0.01$

Based on analysis of the factors that affect the capacity of traditional sago starch processors, increasing their capacity could be achieved through efforts to increase the factors that have an influence on personal and business capacity. Things to do are:

- Improving the role of informal education through various extensions and training to give more experiences to traditional sago starch processor. Informal education could be used to improve their knowledge replacing formal education's role. According to [11] most rural women entrepreneurs are reluctant in adopting improved technologies, one of the reasons is their educational level. So, developing the knowledge base is important to improve women's small enterprise development [15] and a strong knowledge base is a power to get success in export product of Dutch agriculture [16]. For that, prepare extension workers with high competency in sago starch processing and business management is important thing. Also to increase frequency of informal education. Besides that, informal education could be used to increase motivation, the value of social and culture function of sago that have positive and significant relationship to personal capacity.
- Helping traditional sago starch processor to have easy access to information, especially about sago starch processing, would improve their situation. Information communication technologies (ICTs) is popular as a significant tool for economic and social development of least developed countries [17]. With ICTs, agricultural information exchanges could be quickly effected among agricultural workers and could bring about synergic agricultural development to the country [18,19] and extension practitioners should not be underestimated farmer using electronic technology [20]. Mobile phones could be chosen as alternative because in many developing countries, mobile phones significantly reduce communication and information costs for the rural poor and give new opportunities for rural farmers to obtain access to information on agricultural technologies and also to use ICTs in agricultural extension services [21]. The information that traditional sago starch processor needed are about business management, production technology for innovative product of sago with good market's opportunity, how to get home industry permit, packaging technology, and capital access. It is necessary to improve the competitiveness of sago starch products with other food products. Others information are needed about market opportunities, price information of sago products, and how to use information media to access markets, for example how to use website for product promotion.
- In the short term, building business capacity of sago starch processing could be achieved by supporting capital and equipment as loans that have to be paid back so there is a responsibility to use and maintain that support. This support should be given selectively to avoid failures. Besides that, important to motivate traditional sago starch processors for willingness and readiness to work together in group so capacity building program will be easier. Groups should grow up from traditional sago starch processors themselves, not be formed intentionally

to get support. Therefore, it takes time to learn, analyze, and prepare traditional sago starch processors as part of the business group.

#### **4. Conclusion and Recommendations**

This study illustrated that the processing of sago starch in Maluku still dominated by traditional business, both the production process and management. Personal and business capacity of traditional sago starch processor are in medium category. That's why increasing personal capacity and business capacity is important.

This study also reinforced the opinion that the development of sago in Maluku, especially sago starch processing into more innovative and economic products is still progressing slowly. In the future, the development of sago in Maluku, especially sago starch processing has to consider and understand factors that affect to personal and business capacity of traditional sago starch processor.

Characteristics of social economics namely age, length of time in business, informal education, motivation, family size, and individual beliefs about social and cultural values of sago affecting personal capacity, while the level of formal education, household income, and access to information have no effect. Extension worker affecting personal capacity higher than business capacity.

Increasing the components of personal capacity is needed because it is still in the medium category. It can be done through various forms of informal education activities, such as training, extension and counseling, as well as mentoring, primarily to increase business capacity. In the next term, increasing business capacity will increase productivity and income.

#### **Acknowledgements**

Thank you to Nuffic-Unpatti for the financial support and to research team during the fieldwork. Special thanks to all women as traditional sago processors who participated in this study.

#### **References**

- [1] A.K.Singha, M.J.Baruah, R.Bordoloi, P. Dutta, U.S. Saikia. "Analysis on Influencing Factors of Technology Adoption of Different Land Based Enterprises of Farmers Under Diversified Farming System". *Journal of Agricultural Science*, vol. 4, pp. 139-146, Dec. 2011.
- [2] Government of Maluku Province. *Proposal Pengembangan Sagu di Provinsi Maluku Tahun 2007-2032*, Maluku, 2006.
- [3] E. Biénabeand Dennis S. "The role of small scale producers' organizations to address market access," in *International Seminar: Beyond Agriculture: Making Markets Work for the Poor*, 2005, pp. 1-16.
- [4] H. Umar. *Metode Penelitian untuk Skripsi dan Tesis Bisnis*. PT Raja Grafindo Persada, 2004, pp. 108.
- [5] E.Babbie. *The Practice of Social Research*. California: Wadsworth Publishing Company, 2004, pp. 293.
- [6] V. Falguera, N. Aliguer, M. Falguera. "An Integrated Approach to Current Trends in Food Consumption: Moving Toward Functional and Organic Products?" *Food Control*, vol. 26, pp. 274-281, Jan. 2012.
- [7] D. Läßle and T. van Rensburg. "Adoption of Organic Farming: Are There Differences Between Early and Late Adoption?" *Ecological Economics*, vol. 70, pp. 1406-1414, Mar. 2011.

- [8] M. Mani. "Motivation, Challenges and Success Factors of Entrepreneurs: An Empirical Analysis." *Social Sciences and Humanities*, vol. 21, pp. 667-676, Aug. 2013.
- [9] E.M. Kikulwe, J. Wesseler, J.F. Zepeda. "Attitudes, Perceptions, and Trust. Insights from a Consumer Survey Regarding Genetically Modified Banana in Uganda." *Appetite*, vol. 57, pp. 401-413, Jun, 2011.
- [10] T. Anthopoulos. "Rural Women in Local Agrofood Production: Between Entrepreneurial Initiatives and Family Strategies. A Case Study in Greece." *Journal of Rural Studies*, vol. 26, pp. 394-403, 2010.
- [11] Akinbami, C.A.O., Aluko, M.A.O., Momodu, A.S. "Technology Adoption and Women Entrepreneurial Behavior: Case of Agro-Allied Businesses in Rural South Western Nigerian Communities." *International Journal of Science and Technology*, vol. 1, pp. 509-523, Oct. 2012.
- [12] K.Ch. Atapary. "Strategi Pengembangan Teknologi dan Investasi Usaha Pengolahan Sagu di Pulau Ambon." M.Si thesis. Bogor Agricultural University, Bogor, 2010.
- [13] N.A.M. Nasharudin, M. Redzuan, Abd. R. Abd. Rahman. "Factors Contributing to Individual Capacity Building Levels Among Women Entrepreneurs." *Social Sciences and Humanities*, vol. 21, pp. 435-448, Aug. 2013.
- [14] M.D. Anderson and A.C. Bellows. "Introduction to Symposium on Food Sovereignty: Expanding the Analysis and Application." *Agriculture and Human Values*, vol. 29, pp. 177-184, Apr. 2012.
- [15] A. Hossain and S. Islam. (2012), "Information Needs of Rural Women: A study of Three Villages of Bangladesh." *Library Philosophy and Practice*. [e-journal]. Available: <http://digitalcommons.unl.edu/libphilprac/693>, 2012 [10 Dec. 2012].
- [16] M. Van de Kerkhof, A. Groot, M. Borgstein, L. Bos-Gorter. "Moving Beyond the Numbers: A Participatory Evaluation of Sustainability in Dutch Agriculture." *Agriculture and Human Values*, vol. 27, pp. 307-319, Aug. 2009.
- [17] C. Asiedu. "Information Communication Technologies for Gender and Development in Africa: The Case for Radio and Technological Blending." *International Communication Gazette*, vol. 74, pp. 240-257, Mar. 2012.
- [18] O.A. Lawal-Adebawale and B.I. Akeredolu-Ale. "Agricultural Worker's Perception of Information and Communication Technology Usage for Agricultural Development in Southwest Nigeria." *Journal of Social Development in Africa*, vol. 25, pp. 147-176, Jul. 2010.
- [19] B. Aleke, B. U. Ojiako, D.W. Wainwright. "ICT Adoption in Developing Countries: Perspectives from Small-Scale Agribusinesses." *Journal of Enterprise Information Management*, vol. 24, pp. 68-84, 2011.
- [20] J.F. Guenther and B.G. Swan. "Extension Learner's Use of Electronic Technology." *Journal of Extension*, vol. 49, pp. 1-9, Feb. 2011.
- [21] J.C. Aker. "Dial 'A' for Agriculture: A Review of Information and Communication Technologies for Agricultural Extension in Developing Countries." *Agricultural Economics*, vol. 42, pp. 631-647, 2011