

# Staple Food Shift in Papua, Indonesia: A Discussion based on the Study of Diabetic Patients and the Cultural Significance of Sago Palm

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**Abstract:** This paper focuses on the shift in staple food from sago to rice in Papua, Indonesia, by investigating the background of food choices among diabetic patients. In addition to the fieldwork, a literature review was conducted to further discuss sago's cultural significance. There has been a lifestyle shift enforced by modernization and communities migrating from outside the island at the author's field site in the town of Bade in Papua, and diabetes is emerging as a new health issue.

A follow-up survey of the diabetic patients revealed that they had rice more frequently than sago as their staple food. To unravel the background of their food choices, the authors conducted fieldwork and interviews with 11 patients along with medical surveys in Bade from 2012–2013. The investigation focused on: (1) the financial background regarding obtaining sago and rice (a “rice distribution policy” intervention by the Indonesian government made the price of rice affordable to the people), (2) the lack of workers relating to sago management and starch refinement (linked to changes in labor structures), and (3) an aspiration toward rice with the historical background of rice as a prestigious food. Moreover, we found that the doctors at the Puskesmas Public Health Center recommended that their participants eat rice instead of sago in the absence of adequate information about local diet and health.

When discussing the decline in sago intake, understanding its cultural background was crucial. For this reason, we conducted a literature review to deconstruct and grasp sago's significance in society, with a particular focus on people's beliefs and values. The findings suggested that sago holds a strong mythical presence in the New Guinea region and contributed to the structure of the gendered division of labor. Sago had—and perhaps still has—an important position in the socially constructed society. However, it was difficult to find recent literature regarding the contemporary understanding of sago in Papua. Therefore, the attitude toward sago in the local community is a topic for future research.

**Keywords:** Diabetes, Food choice, Papua Indonesia, Staple food

## 1. Introduction

The increase in type 2 diabetes in Southeast Asia is becoming a social problem (Dans, 2011), a serious issue, especially in developing regions. Lifestyle changes, including those brought about by colonization, may particularly affect the health of indigenous people. In March 2012, a medical survey was conducted in Bade—a town near the Digul River

in the Mapi Regency, Papua, Indonesia. Here, there was a shift in the market economy from the traditional lifestyle. The local native ethnicity is Auyu; however, rubber plantations have recently attracted a large number of migrants to the town. Bade's population is 4,643, out of the Mapi Regency's total population of 81,781 (Regional Account and Statistics Analysis Division, 2013). Among the survey participants of

119 community-living adults (aged 40 years and older, male = 62; female = 57), 6% were diagnosed as diabetic, and 11% had impaired glucose tolerance (Kimura et al., 2013). The statistics of diabetes in this area had never been reported. However, a health survey conducted in 1999 with the Dani tribes living in the central highlands of Papua (Matsubayashi et al., 2000) reported that only 2 of 176 subjects had high blood sugar levels. These results indicate that only limited cases of suspected diabetes were found (Fujisawa et al., 2000).

The survey in Bade observed a unique background of diabetes—in contrast to “excessive nutrition,” a generally common lifestyle background of diabetes, misunderstandings about food were the underlying cause in this region. We previously reported the case of a female patient who consumed a large amount of rice daily because she believed that eating rice could help her recover from her physical impairment (Kimura et al., 2013). During the survey in 2012, the author (Kimura) conducted a nutrition interview with the diabetic patients and found that they ate rice more frequently than their traditional food, sago starch. Given those experiences in this fieldwork, the research question was raised: why are these people consuming more rice despite their traditional staple food being

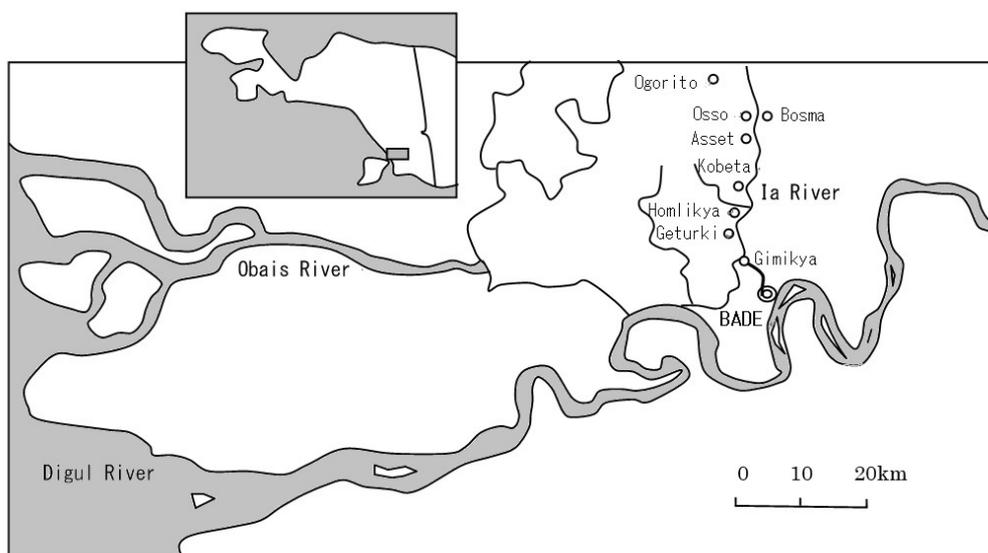
sago? This question led to a hypothesis that the increase of diabetes in this region developed due to a shift of staple food from sago to rice. However, the reasons behind the shift in staple food (sago to rice) were not yet understood.

This article reports the results of the interview survey conducted in 2013 in Bade, Papua, in Indonesia on diabetic patients and explores the background of their food choices. It summarizes the qualitative interview data on the reasonings behind the shift from sago to rice as a staple food. To further discuss the cultural importance of sago, an anthropological literature review was conducted with a particular focus on people's beliefs and values regarding sago in society.

## 2. Survey on the background of food choices of diabetic patients

The study site is Bade, a small port town on the lower coast of the Digul River, located in southwest Papua (Figure 1). Sago, starch from the sago palm tree, has been a traditional staple food for the people of Bade, and it is originally produced from local sago trees (Figure 2). In this community, sago starch is often prepared by baking on an iron plate or wrapped in banana leaves and baked over a charcoal fire.

During the survey in 2013, the author (Kimura)



**Fig 1.** Map of the study site, Bade, in Mapi Regency in Papua  
\*Cited by the reference (Inamura, et al. 2013)



Processing sago in the field (left), sago cake with cassava leaves at a meal (right)

**Fig 2.** Processing sago starch and cooked sago

revisited the diabetic patients' homes to follow-up on their health and dietary status. An interview survey was conducted on 11 patients (3 men, 8 women, ranging from 42–72 years of age) about their food choices. The survey included body weight and height measurements for obtaining body mass index (BMI, kg/m<sup>2</sup>), a blood test, and nutrition assessment using the 24-hour recall method revealing the daily food

intake. The interview inquired about the frequency of sago/rice consumption, favorite food, and who regularly cooked household meals.

The basic characteristics of the subjects are shown in Table 1. The major staple food was identified by asking the frequency of food intake in a week. Three people ate sago more frequently than rice, and seven people believed that “rice is a healthy food.” A

**Table 1.** Basic information of the subjects

	Age	Sex	Diabetic status*	BMI (kg/m <sup>2</sup> )	Person who regularly cooks household meals	Major staple food	Favorite food
A	69	F	DM	34.1	Daughter	Rice	Rice
B	65	M	IGT	20.4	Wife, daughter	Sago	Sago
C	56	M	DM	24.1	Wife	Rice	Everything
D	56	F	DM	26.9	Herself	Rice	Sago
E	68	F	IGT	19.1	Daughter	Sago	Sago
F	72	F	IGT	21.7	Herself	Rice	Rice, banana
G	62	M	IGT	23.0	Daughter	Rice	Nothing
H	59	F	IGT	26.3	Daughter	Rice	Fish, rice
I	43	F	DM	33.2	Herself	Rice	Rice
J	62	F	IGT	25.7	Daughter	Sago, tubers	Rice
K	60	F	DM	26.2	Herself, daughter	Rice	Rice, vegetables

\*For ensuring the diabetic status, diabetes mellitus (DM) or impaired glucose tolerance (IGT) was diagnosed under World Health Organization criteria.

woman who suffered from diabetes and obesity strongly believed that rice consumption relieved her physical fatigue, which encouraged her to keep eating large amounts of cooked rice daily (about 300 g per meal). According to the nutrition assessment of a particular day, over 84% of her energy intake came from rice. Some stated, “rice gives more energy than sago,” and to enhance this, a particular woman had sprinkled sugar on her rice when she felt tired. As the reason for not eating sago, one explained that “sago is expensive” and that sago from the market is not as tasty as sago processed at home. On the other hand, some said that “processing sago is hard work, and we cannot continue doing it because our sago is located far from home.” It has seemingly become increasingly difficult for older people to sustain homemade sago on their own.

### 3. Fieldwork of social issues surrounding sago and rice

Fieldwork was also conducted in public facilities such as markets and the town’s health center to further understand the situation underlying sago and rice. Table 2 shows the different prices of foods at a market in Bade and the capital city of Papua, Jayapura. The market in this region is comprised of a gathering of small shops and individual traders; therefore, food prices varied. The prices listed in the table are an average from multiple shops and traders. Sago in the market in Bade was sold in a plastic bag in the form of dried powdered sago, 800 to 1 kg per bag (Figure 3). On the other hand, sago in Jayapura and Sentani markets was sold in large chunks. Its minimum portion was 2 kg per piece. The price of rice varied according to its grade, where the cheapest cost was around 10,000 IDR/kg (nearly 1 USD/kg), which was almost

**Table 2.** Price of foods in a market in Bade, Jayapura and Sentani in 2012 and 2013 (Unit: Rp.)

	Sago	Rice	Chicken	Sugar	Oil
Bade	10,000/1 pack (800g-1kg)	83,300- 100,000/10kg	20,000/kg	15,000- 18,000/kg	33,333/l (Coconut oil)
Jayapura (Sentani*)	20,000/1piece (2kg)	104,750- 145,000/10kg	29,900- 52,690/kg	13,500- 14,500/kg	13,000-14,7000/l (Palm oil)

\*The prices of foods at markets includes a market in Jayapura and one in Sentani, a neighborhood city of Jayapura.



**Fig 3.** Sago starch and various local foods sold at a market in Bade, Papua

the same as the price of sago per kg. This means that rice has become affordable to people at the equivalent cost of sago—a historically and traditionally recognized costless food source accessible from the forest within local communities.

The reason rice is favored over sago may be tied to social status. Until the 1960s, rice was not distributed to the public. It was exclusively handed to those living in the dorms of government workers and schools. Rice was introduced to the island as food eaten at the Dutch missionary school or by government associates, thereby accounting for its status as superior food. As rice was the “new food” from outside the island, it also evoked a strong sense of admiration. These socially constructed meanings may contribute to the reason behind the preference for rice over sago.

When speaking with the elderly, they often mentioned advertisements that frequently promoted eating rice on television. This advertisement may have been due to the Indonesian government’s strong focus on increasing rice production, which grew significantly in the 1980s. In 1998, a rice distribution policy, RASKIN (Rice for the Poor Program), encouraged the eating of rice and assisted in delivering cheap rice to poor areas. This political background might strongly affect the dietary habit in local communities in Papua. Rice became more accessible for people while, on the contrary, acquiring sago became more complex.

Investigating the opinions (above mentioned) that processing sago requires hard labor, we found more households with sago trees generally grown in neighboring towns or towns near the Digul River. Thus, more elderly people struggled to obtain homemade sago. Moreover, with the industrial shift in Bade, the number of workers in the rubber production industry grew, and household incomes soared (Inamura et al., 2013). Today, with the harsh reality of unstable jobs and the prospect of higher education schools, many young families are choosing to leave Bade. These factors may contribute to less household production of sago starch.

Furthermore, the scarcity of health information regarding lifestyle-related diseases from Puskesmas might have spread misunderstandings about an adequate diet. The two doctors on duty in Puskesmas in Bade were from outside New Guinea, having been hired on a short-term contract. They had a poor understanding of the sago diet. They gained an impression that sago was unsanitary when they witnessed the process of retrieving sago starch with brown water, then stored in damp conditions. The doctor told patients not to eat sago when they were sick and recommended eating rice porridge instead. This recommendation might be one reason for the misunderstanding of rice: that rice can contribute to recovery from illness. The absence of cultural information was thought to have influenced the widespread misunderstanding about rice. At this Puskesmas, there were few measures for lifestyle-related diseases, as infectious diseases are the number one issue in this region. Carrying the “double burden of disease” in developing regions (Boutayeb, 2006) is not rare in Papua. While measures against growing lifestyle diseases are required, infectious disease control was a priority at this Puskesmas. Thus, the preference for rice had spread based on social and economic backgrounds, a sense of admiration, and a lack of adequate information on food and its effect. In addition, the interview subjects (older adults with diabetes) shared their negative opinions of sago, in contrast to their preference for rice. Obtaining homemade sago had become too much work, and buying it was too expensive.

#### **4. An anthropological literature review of the cultural meaning of sago**

The shift in staple food has been explored thus far. Nevertheless, this change is contemporary. The reasons for this shift lie in the socioeconomic backgrounds influenced by globalization and Indonesian government policies. However, sago has traditionally been eaten until today, which may be tied to its cultural significance. Yet, since the ethnographic fieldwork for

this research was conducted on a selected group of people, we struggled to conduct a comprehensive review about sago's cultural and historical relevance. For this reason, a literature review was conducted to gain a cultural lens for understanding further how people's beliefs about sago contributed to society. There is not much literature about sago in Papua, especially western New Guinea. Therefore, this literature review incorporated a wider region, including some areas in the entirety of New Guinea.

The literature review revealed that sago had a strong mythical presence and contributed to the gendered division of labor. Sago, with strong roots in myths, has influenced the people's understanding of life. For example, there are beliefs that the birth of sago triggered the world's birth. Alternatively, branching from the idea that sago is female, the plant often symbolizes the life cycle. Therefore, the plant is used for coming-of-age rituals (Ruddle et al., 1978). In addition, Chao found that the Marind-Anim tribe, mainly living west of the Maro River in West Papua, believes that humans and sago have the same ancestry. They believe that all relationships are founded on respect and exchange. The sago palm dedicates food and ingredients to the Marind-Anim tribe, which in turn performs rituals to honor the sago palm. Through this exchange, it is believed that humans and sago will grow together and prosper (Chao, 2019). Cultures where sago and humans live together exist further, especially in the Daiden region along the Ramu River in Papua New Guinea (Poser, 2013). For the Bosmun living in Daiden, sago intertwines with life; when a child is born, a sago palm is planted, and this child grows with his or her specific sago palm. When the sago reaches 12 to 15 years, the child is considered an adult. When the sago changes form, usually by developing flowers, the human body also begins to mature (Poser, 2013). This physical change signals the child's societal debut (Poser, 2013). Sago appears in myths as giving crucial assistance to the development of human society; these myths provide insight into the construct and mechanism of social relationships.

In addition, sago encourages and builds the gendered division of labor. In the Chimbu region of the New Guinea Highlands, men grow the sago, and women prepare meals (Brookfield and Brown, 1963). The Bosmun tribe reinforces gender roles through sago labor, as Poser centralizes this observation by relying on phenomenology (Poser, 2013). In provinces along the Sepik River in Papua New Guinea, men are in charge of cutting/transporting sago. The women cook and transform the plant into household objects (Toyoda et al., 2005; Toyoda, 2008). Women also symbolize change, thereby bringing vitality and versatility to the village farms. Much as in the Sandaun Province of Papua New Guinea, a woman married to Sowom from Atiape introduced sago frying, a new style of cooking, to her husband's region (Toyoda et al., 2005). Interestingly, despite the vital gender roles existing around sago, this falls apart in certain circumstances. On occasions when crops that are not sago (such as vegetables or starch) are harvested (Townsend, 1974) or when sago is produced for economic purposes (Ruddle et al., 1978), the gendered division of labor becomes flexible. This poses a premise that because sago has a deep-rooted history, it contributed to the gender division of labor. Meanwhile, foreign crops introduced might lack such profound cultural significance. With these cultural perceptions of the crop, some areas forbid women from cultivating sago (Toyoda, 2008). From the lens of gender, the sago palm's contribution to the construct of society can be observed.

## 5. Discussion

First, the interview survey and fieldwork in Bade revealed that rice was preferred over sago among diabetic patients. Thus far, we have explored the background of their food choices: (1) price changes (political influence), (2) social changes in obtaining sago, (3) an aspiration toward rice.

Few recent studies have been published on the social background of the staple food sago and its recent changes in Papua. However, decreasing sago

consumption in other regions in several Indonesian islands has been reported. For example, sago production in South Sulawesi has decreased by 86% from 2006 to 2013. Nevertheless, the growing area of sago palm had not changed vastly (Metaragakusuma et al., 2017). Girsang reported that socioeconomic factors had influenced the decline of sago consumption in the Maluku Region of Indonesia, discussing from an angle of food security issues (Girsang, 2014). In his research, the influence of political intervention on the price of rice was introduced as a vital factor in persuading people to choose rice. The same situation was found in our field research. Coincidentally, the price of rice introduced in Girsang's research on Maluku Island was similar to the price observed in Bade, Papua, in 2012–2013. Girsang also pointed out that the shift of the market economy, explained through household expenditures in three different regions, and education of the young generation are affecting the decline in choosing sago. The processing of sago starch is time consuming. The elderly patients in our survey claimed that it was challenging to obtain sago traditionally, regardless of having sago trees in their neighboring villages. Social change, especially with the industry's drastic shift, has significantly affected the sago intake in local communities of Papua.

Furthermore, in contrast to the lingering colonial historical influence on aspiration toward rice, research subjects had a negative image of sago. Nevertheless, people's beliefs and social values should affect sago's position as a traditional food, since there has been a history of dependence on sago since ancient times. Hence, an in-depth literature review on sago's cultural significance was conducted. Through the literature review, while myths and legends may sound abstract in deconstructing the mechanism of society, these stories hold many hints for understanding social orders and societal constructs. Stories are essential where there is scarcely written history. The myths and legends of some Papua and Papua New Guinean communities explained how human beings came to be;

in these stories, sago played a crucial role as the life source that allowed humans to prosper. Moreover, sago grounded the gendered division of labor, subconsciously embedding gender roles in society. Considering the findings from Townsend—that foreign crops introduced to the region collapsed the gendered division of labor (Townsend, 1974)—we cannot indeed argue that the rice newly introduced in Bade will replace sago, carrying historically rooted ideas. However, younger generations' dietary habits in Papua are still being studied; thus, the perception of sago in the current society needs further research.

Syartiwidya and colleagues surveyed five villages in the Kepulauan Meranti District, Rian Province, Indonesia. They suggested that sago consumption was higher among older subjects than younger ones (Syartiwidya et al., 2019). They also reported that the subjects who consumed more sago were less likely to be overweight and obese. Food choices and preferences might differ across generations; therefore, this can lead to different health outcomes across various age groups in the future. Our interviews of the doctors at Puskesmas and their patients shed light on the increased rice consumption: it lay in cultural misunderstandings founded on prejudice toward the production and eating of sago.

This study is only an initial attempt at discussing the hypothesis: the severity of diabetes in this region developed due to a shift of staple food from sago to rice, through limited fieldwork findings. However, the selection of rice over sago raises concerns about its negative effect on health, namely diabetes. Many factors influence diabetic status—peoples' diets, exercise habits, physical activities, age, and susceptibility, including genetic predispositions. At the same time, previous research by systematic review reported that white rice consumption is related to diabetes (Hu et al., 2012). The risk of depending too much on rice consumption could be explained by white rice having a high glycemic index (GI) value (Foster, 2002). On the other hand, sago starch had lower GI values, even though the types of processed

products were reported to be varied (Henry, 2021; Wahjuningsih, 2016). Sago starch also contains a high level of amylose, which is beneficial for diabetic patients. It normalizes the insulin response with continuous consumption (Behall 1995).

In addition, from the viewpoint of nutrition, rice consumption as a staple food can lead to a diet with poor variety. The authors found that patients eating too much rice had less diversity of food intake in their daily meals. From a nutritional perspective, food diversity is essential for individual health, as consuming a variety of daily foods has been reported to be closely associated with longevity (Kant, 1995). Several dietary guidelines have long emphasized the value of eating a variety of foods. Girsang also mentioned food diversity from food security in his research (Girsang, 2014), noting that people never consume sago alone but always with fish, tubers, and vegetables.

Girsang's findings suggested that the local production of rice only supported 40% of the total rice demand, and the heavy import of the new staple food was becoming an issue in the Maluku Region. Hence, the greater the dependency on rice, the more problems with food security rises. Sago brings hope for resisting the decline in food security. Sago is environmentally friendly, resistant to climate change, and grows well in marginal lands (Girsang, 2014). However, with the pressure of capitalism and the control of the Indonesian government, land use and market-oriented perspectives posed obstacles for sago to reach its full potential in the local community. As Girsang argues, while emphasizing higher powers as main actors of various social issues is crucial, the reality is that their consequences trickle down to the local community. Therefore, it is equally vital to spotlight the voices of ordinary people. Regarding sago use and the changes in staple food, an understanding of the local community's apprehension of sago allows us to formulate the resolution to problems such as lifestyle-related diseases or food security.

So far, we have seen how consumption has shifted

from sago to rice due to socio-economic impacts. We extended this discussion by considering how this shift also might influence the severity of diabetes. When considering this alarming issue in the case of sago in Papua, we still do not know whether this trend away from sago and toward rice as a staple food is long-term or temporary. Therefore, considering sago's cultural background is essential, as people's various beliefs and perspectives can contribute to these changes. This is shown through our literature review, where it is important to understand sago's strong significance in society or gender roles.

Limitations of this study lie in the fact that interviews were conducted solely with older adults who had diabetes, so perceptions among the younger generation were not included. Moreover, there were limited recent anthropological findings and discussions of the meaning of the sago diet and its changes in Papua. Therefore, the change in sago's position in Bade in Papua remains unknown. Further study on the current situation is anticipated.

## 6. Conclusion

Changes in staple foods were primarily affected by socio-economic background in Bade, Papua. The replacement of sago with rice as a staple food might lead to future concerns such as health issues and the loss of sago-related culture, its oral history, and rituals. Further research on the cultural perspectives of sago in contemporary society must be conducted.

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