UNDERSTANDING CHANGES IN PATTERNS IN FERMENTED FISH PASTE (PRAHOK) PRODUCTION AND CONSUMPTION AMONG CAMBODIAN PRAHOK MAKERS IN TONLE SAP LAKE

by

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AUTHOR'S DECLARATION

I, Uon Sokmoly, declare that the research work carried out for this thesis was in accordance with the regulations of the Asian Institute of Technology. The work presented in it is my own and has been generated by me as the result of my own original research, and if external sources were used, such sources have been cited. It is original and has not been submitted to any other institution to obtain another degree or qualification. This is a true copy of the thesis, including final revisions.

Date: 18 April 2023

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ABSTRACT

This study aims to understand how the changes in prahok production and consumption among prahok makers are affected by and led to different perceptions of women for these changes. The qualitative method (phenomenology) was applied in this study. There were 20 female and 11 male respondents selected for in-depth interviews. This study was conducted in two different categories of areas: seasonally flooded village (Preaek Sramaoch and Mok Wat villages) and displaced village (Chhnok Tru village).

This study found that there were some factors that affected prahok production and consumption patterns among prahok makers in Tonle Sap Lake including livelihood strategies; increasing price of inputs; changes in consumers' preference; decrease in the amount of fish caught; changes in market trend; time-saving and the easiest of selling fresh fish or semi-processed prahok; lack of capital; time-consuming of producing prahok; and change in living patterns. The effects of these factors made prahok makers into different groups of prahok production and changed their prahok production and consumption patterns in different ways. Due to these effects, the study revealed that there were four groups of prahok production: Home consumption Prahok makers (group 1); Professional Prahok makers (group 2); Fresh fish/Semi-processed Prahok sellers (group 3); and Quitting Prahok makers (group 4). In prahok production patterns, there were some key different changes among these four groups including types of prahok for producing, purposes of producing, sources of fish for processing, production scale, labor use, gender roles, income getting from prahok, amount of producing, and significant roles of prahok production. In prahok consumption patterns, there also had some key different changes among these four groups such as types of prahok for consumption, where to get prahok, amount of using, and ways of using prahok.

This study also figured out why women from different groups of prahok production changed their prahok production and consumption. Women from different groups had different reasons for these changes including lack of time, change in food preference, decrease in revenue from selling prahok, gender stereotypes, household's economic matters, household work burden, change in food culture, business competition, the decrease amount of producing prahok, health issues, job alternatives, changes in gender roles in the family, decrease in household members, and limited food expenses. Based on these reasons, this study indicates that women who had abilities for working with other jobs might less engage in prahok production. Conversely, those women who mainly relied on prahok production as their primary career or family income might like to continue processing prahok though there were some changes in prahok production. Remarkably, women who were no longer relying on prahok production as their primary career or family income might like to switch career as prahok makers to do other jobs to adapt to their livelihoods. It's also realised women who were no longer in good health and had assistance from their family members or those who could find other better jobs than processing prahok might like to quit prahok production.

Keywords: Changes, patterns, production, consumption, fermented fish paste, Prahok makers

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

FAO	: Food and Agriculture of Organization
FIA	: Fisheries Administration (Cambodia)
GDP	: Gross Domestic Product
Kg	: Kilograms
UNIDO	: United Nations Industrial Development Organization
USD	: United States Dollars
KII	: Key Informant Interview
HH	: Household
Yr	: Year

CHAPTER 1
INTRODUCTION

1.1 Background of the Study

Fisheries have a vital role in ensuring the national economy, household food security, and livelihoods for Cambodian people across locations in the country (Richardson & Suvedi, 2018). The total production of Cambodia's marine and freshwater capture fisheries is estimated at about over 400, 000 tons per year (accounted for around USD 1.6 billion) which contributes approximately 12 percent to the country's GDP (Nam & Bunthang, 2011). Additionally, fisheries sectors provide huge job opportunities for Cambodians which is about 45 percent of the total population including full-time jobs in fisheries and fisheries-related activities, and also secondary jobs of income and foods for daily consumption (Nam & Bunthang, 2011). With an estimated annual consumption of 52.4 kg (81.5% of the total animal protein intake), Cambodian citizens are among the world's top per capita consumers of freshwater fish (Nam et al., 2009).

Regarding inland fisheries, Tonle Sap lake is a main source and area of Cambodian's inland fisheries products (freshwater fish), and it is the biggest and most productive lake in South East Asia which connects to the Mekong river (Richardson & Suvedi, 2018). The average area of Tonle Sap lake surface is more than fourfold, from 3500 Km^2 during the dry seasons (December to April) to a peak of 14,500 Km^2 during the rainy season (July to September) (Richardson & Suvedi, 2018). The total amount of fish produced in Cambodia in 2018 was 910,153 tons, with inland capture fisheries accounting for 59%, followed by aquaculture and marine fisheries, which accounted for 28% and 13%, respectively (Kamsan, 2019). Based on its potential productive ecosystem, Tonle Sap offers a large amount of freshwater fish with numerous fish species that can provide food security and job opportunities for Cambodian people, especially for those who live on the Tonle Sap lake (floating villages) and surround the Tonle Sap lake (Lamberts, 2006).

Along Cambodia's inland fish value chain, fish processing is recognized as a significant process that can create numerous employment for Cambodian people, especially poor women surrounding Tonle Sap lake (Ratha et al., 2021). Notably, around 57 percent of women work in the fisheries sector while most of them are highly involved in post-harvest activities, particularly in trade, processing, and marketing activities (Kusakabe & Sereyvath, 2014).

Fish processing techniques in Cambodia are different depending on locality and tradition, but the traditional method is commonly used for processing fish products by households and small-scale levels (Lamberts, 2006). In addition, it was recorded that a large amount of total fish production in Cambodia has been processed into dried fish such as salted-dried fish, fermented fish, fermented fish paste (Prahok), smoked fish, fish sauce, and other derived products through traditional techniques including sun-drying, salting, smoking, steaming, and fermentation (FAO, 2019).

In terms of food, fresh fish and dried fish products have a long history and are closely linked to all Cambodians that it is a significant source of nutritious food in the daily diet, a primary source of income, and have strong cultural and religious importance (Richardson & Suvedi, 2018). In particular, fermented fish paste like prahok is a very famous food ingredient for Khmer traditional food in Cambodia (Nam et al., 2009). Indeed, prahok is a great food for the elderly or small children, and it is commonly kept and used in all Cambodian households (Nam et al., 2009). Furthermore, Cambodia has hundred years old tradition of producing fermented fish, salted-dried fish, smoked fish, and fish sauce which are popularly consumed in the domestic market as well as exporting (Ratha et al., 2021).

As mentioned earlier, fish processing in general and fermented fish (prahok) in particular contribute to numerous advantages for Cambodia including the country's economic growth, job opportunities, food tradition, culture, and identity of the locality. In addition, women play a vital role in fish processing in Cambodia where they can earn secondary income to support their family. However, Cambodian women's roles in this sector are often overlooked and have many challenges for those who work as small-scale fish processors/entrepreneurs due to gender norms and socio-economic constraints (UNIDO & FIA, 2021). Therefore, the next section will highlight the issues of Cambodian fish processors, especially fish processors in floating areas that they used to face, and how fish processing means to their livelihood.

1.2 Problem Statement

Fermented fish paste (Prahok) produced in different regions of the country has distinct sensory characteristics that consumers prefer (LeGrand et al., 2020). Indeed, popular fish processing products, especially prahok is most consumed by Cambodians originated from the areas surrounding Tonle Sap lake (e.g. Kampong Chhnang, Siem Reap, Kampong Thom, Battambang, and Pursat provinces) where most fisher households often processed fish for

their daily consumption and selling (Seng, 2017). Interestingly, traditional practitioners and experienced fish processors in rural communities continue to play vital roles in changing the food system of Cambodia (LeGrand et al., 2020). Furthermore, Prahok is a special traditional product that is necessary for daily cooking. On average, each household consumes prahok over 10 Kg of fish paste a year (Sokhorng, 2016). In terms of production, the volume of fermented fish paste (prahok) in 2018 was quite high which accounted for 29, 881 tons while other dried fish products (from freshwater fishes) such as dry salted fish and smoked fish had been produced only 18,221 tons and 3,183 tons respectively (UNIDO & FIA, 2021).

However, Cambodian fish processors in general and fermented fish paste (prahok) makers in particular, have faced many challenges due to environmental and cultural changes in the areas of their fishing, particularly women processors (Mousset et al., 2016). Meanwhile, the changes of socio-economic include changes in fishing patterns, market prices either inputs and fish products, environmental, cultural, and seasonal changes, a decreasing quantity of freshwater fish, and lack of capital are also the key challenges for Cambodian fish processors and workers (UNIDO & FIA, 2021). Recently, the Cambodian government announced relocation of people who live on the water of Tonle Sap Lake in some areas by suggesting them to move their livings on the ground instead of living on the water in order to reorganize the Tonle Sap Lake's environment as well as keep the lake as conservation areas for freshwater fishes in the country.

Another issue is that freshwater fisheries in 2020 yielded 250,000 tons of fish, down 965 tons from the same period last year due to a report from the Ministry of Agriculture, Forestry and Fisheries, released in October (Sarath, 2020). Moreover, there had been a 78 percent drop in exports and 94 percent reduction in fish processing (Sarath, 2020). Thus, these changes have affected the livelihoods and careers of people who used to live on Tonle Sap water, particularly those who have relied on fishing and fish processing activities.

Due to these changes, Cambodian who live in the Tonle Sap lake (including relocating people from the floating villages and others who lived in seasonally flooded areas of the Tonle Sap lake) have difficulty in making prahok as the amount of catching fish less than before. In particular, some people in Chhnok Tru village (displaced village) gave up processing prahok while other still continue to make prahok, but the amount of prahok just enough for home consumption or less amount for selling compared to the previous times. Indeed, this change led to decrease in their primary income due to the decrease in prahok production.

Furthermore, some people in the village have switched from making prahok to work as hired labor in and outside the community to earn more income for supporting their livelihood (Sarath, 2020). According to these issues, it is necessary to understand how the changes in prahok production and consumption among prahok makers are affected by and led to different perceptions of women for these changes.

1.3 Rationale of the Study

Fish and fish processing activities have played a very important role in providing a source of food security and nutrition, and income to millions of Cambodians, especially for rural poor people in Cambodia (Norng et al., 2011). In the fisheries sector also, Cambodian women are more likely to engage in post-harvest activities (such as fishing processing, trading, and marketing) while men are more likely to involve in fishing activities, transportation, and so on. Regarding Cambodian's inland fisheries areas, Tonle Sap lake is one of the most potential sources that provides a significant productive ecosystem and supports the livelihoods of at least two million people, particularly a large number of small-scale fishers (Seng, 2017). Households who live near Tonle Sap Lake primarily participate in small-scale artisanal and subsistence fishing, supplemented by agriculture, livestock raising, aquaculture, off-farm work, and remittances (Bond, 2015). Nonetheless, many of the poorest households rely on one source of income, which is typically fishing and processing fish (Nuorteva et al., 2010).

Dried fish products, as preservation food, remain a core component of food production, food security, trade, economic value, and cultural heritage value across many nations in Asia (Belton et al., 2022). In the context of Cambodia, fermented fish paste (Prahok) is a kind of dried fish product that is popularly consumed by Cambodians for Khmer traditional food across locations in the country. Indeed, local fermented fish paste like prahok has a long history and represents great value and various meanings for Cambodians in terms of food security, traditional food culture, and locality identity (LeGrand et al., 2020). Furthermore, fermented fish paste like prahok generates job opportunities and main source of income for millions of Cambodians who live surrounding Tonle Sap lake, especially women (LeGrand et al., 2020).

Currently, the Cambodian government announced to relocating of people who live on the water of Tonle Sap Lake by suggesting them move their living on the ground instead of living on the water in order to reorganize the Tonle Sap Lake's environment as well as keep the lake

as conservation areas for freshwater fishes in the country. However, this change might affect the livelihood and careers of people who used to live on the water, particularly people who have relied on fishing and fish processing activities. In particular, freshwater fisheries in 2020 yielded 250,000 tons of fish, down 965 tons from the same period last year due to a report from the Ministry of Agriculture, Forestry and Fisheries, released in October (Sarath, 2020). Moreover, there had been a 78 percent drop in exports and 94 percent reduction in fish processing (Sarath, 2020).

Therefore, this study focuses on how the changes in prahok production and consumption among prahok makers are affected by and led to different perceptions of women for these changes. In addition, gender analysis in prahok production and consumption among prahok makers is necessary to obtain the main purposes of this study. Particularly, it was used to understand the changes in patterns in prahok production and consumption among women as prahok makers, different perceptions about the changes, the issues of gender roles or gender relations in the household, prahok production, and prahok consumption among prahok makers that might affect their prahok production or consumption. Furthermore, this study also aims to explore the reasons for changes in prahok production and consumption patterns among prahok makers. Last but not least, this study can be significant for further research and project implementers who prefer to explore and work related to Cambodia fish processing, especially women in fermented fish paste (prahok) processing.

1.4 Research Questions

This study aims to answer the question "How are the changes in prahok production and consumption among prahok makers affected by and led to different perceptions of women for these changes?". In order to answer this question, a gender analysis of the production and consumption of prahok is needed. This main question followed by two sub-questions as following:

(1) What are the changes in patterns in prahok production and consumption among prahok makers?

(2) Why have prahok makers changed the production and consumption patterns?

1.5 Objectives of the Study

1.5.1 Overall Objective

This study aims to understand how the changes in prahok production and consumption among prahok makers are affected by and led to different perceptions of women for these changes.

1.5.2 Specific Objectives

There are two main objectives in this study:

- To explore the changes in patterns in prahok production and consumption among prahok makers.
- To explore and analyse the reasons for changes in prahok production and consumption patterns among prahok makers.

1.6 Scope of the Study

This study centered on how the changes in prahok production and consumption among prahok makers are affected by and led to different perceptions of women for these changes. Indeed, this study only focused on people who used to make prahok at household levels (micro or small size production) before, but now they still continue or do not continue processing prahok anymore. The contents of this study covered the changes in patterns of prahok production and consumption among prahok makers; identifying factors that affected prahok production; feelings about the changes and reasons for changes among prahok makers. Additionally, this study also further looked at perceptions on how they see their prahok production after they changed it.

Among the potential areas in Tonle Sap lake, three villages that had different access to fish resources were selected as the target areas of this study namely: Preaek Sramaoch village (Siem Reap province), Mok Wat village (Siem Reap province), and Chhnok Tru village (Kampong Chhnang province). To obtain the purposes of the study, the qualitative method was applied in this study through in-depth interviews with 31 respondents in the study areas. This study conducted from mid-October to the end of December 2022.

CHAPTER 2
LITERATURE REVIEW

This chapter reviews the information related to fermented food products from various studies across national and international locations. This chapter also reviews and discusses the relationship between food and culture, food and consumption, and how food processing could link to gender. Indeed, the chapter also illustrates significance roles of fish processing (including fermented fish paste) among Cambodian and how gender issues emerged in processing fish process, especially women and men processors. There are nine main parts that are reviewed and illustrated in this chapter namely: overview of fermented foods, food and culture, food and consumption, women's food enterprises, women and men in (fermented) fish processing, fish processing in Cambodia, the roles of fish processing (dried fish products) for Cambodians, gender issues among Cambodian women and men in fish processing in general and specifically in fermented fish paste processing, and conceptual framework.

2.1 Overview of Fermented Foods

Fermentation is one of the earliest biotechnologies for making food products with desirable qualities, like a long shelf life and good organoleptic properties (Smid & Hugenholtz, 2010). It plays various roles in food processing. In terms of food fermentation, it typically has improved microbial safety and stability, and also can be stored at room temperature. Indeed, the products produced by fermented food processes are also more enticing to consumers (R. C. Ray & Joshi, 2014). In addition, fermented food has been practiced for thousands of years which include various types of fermented foods including cereals, fish, meat, vegetables, milk, and other dairy products. Nowadays, people view fermented foods as essential part for their diet (R. C. Ray & Joshi, 2014). Particularly, there are many different kinds of fermented food products available in Asia, including alcoholic beverages, fermented bread and porridge, fermented fish, vegetables, and fruits (Hasan et al., 2014).

Furthermore, fermentation is a traditional method of food preservation. Techniques of fermented foods are frequently used on a small scale and at the household level. They are processed using basic, non-sterile machinery, random or natural inocula, uncontrolled conditions, sensory fluctuations, inadequate durability, and unattractive packaging of the processed goods, resulting in food of varying quality (Oyewole & Isah, 2012). Currently,

diverse populations around the world consume more than 5,000 different types of fermented foods, many of which are native and produced in modest quantities to fulfill the requirements of particular groups (M. Ray et al., 2016). For instance, fermented foods have become a significant component of Indian diets for centuries because fermentation is a low-cost technology that preserves food and enhances its nutritional value. Based on the significance and popularity of fermented foods, some fermented fish food products have undergone extensive research in fermented food culture in Asia (Lee & Kim, 2013).

2.1.1 History of Fermented Foods

Fermentation has been used as a food processing technique for millennia. The historical record of fermented foods is lost in ancient times. It was found out that the processing of fermented foods originated in the Indian Sub-continent (R. C. Ray & Joshi, 2014). Additionally, it is found that cheese is the earliest food product of fermentation processing technique (R. C. Ray & Joshi, 2014). In this part, I will review three kinds of fermented foods which are popular consumed across the countries in Asia including fermented vegetables, fermented meat, and fermented fish.

Regarding fermented vegetable products, Kimchi is a unique type of fermented food with a long history in Korea (Lee & Kim, 2016). Today, Kimchi remains a main side dish of Korean's foodies which commonly eat it with rice or cook with other ingredients. There are more than fifty different kinds of kimchi, which vary depending on the raw materials used, the processing methods used, and the preparation's season and location (C. H. Lee & Kim, 2016). In addition, it is claimed that pickled vegetables and fermented vegetables are popular dietary practices in either Asia or Europe (C. H. Lee & Kim, 2016).

Relating to fermented meat products, it is categorized into two groups: (i) fermented meat products produced from whole pieces of meat, for example hams; (ii) and fermented meat products made from chopped meat, such as different types of sausage. Fermented meat products were produced by limited a low-energy and biological-acidulation preservation techniques that create distinct meat properties such as flavor, color, and a variety of other favorable traits Asia (Ockerman & Basu, 2014). Besides fermentation, meat products are also undergo by different traditional processing methods including drying and smoking (Rawat et al., 2018). The foods made from fermented meat seem to be gaining popularity on a global

scale; for example, pizza made from fermented meat is rising in popularity in Asia. (Ockerman & Basu, 2014).

In terms of fermented fish products, it has created a significant status when addressing the origins of Asian cuisine. The preservation of fermented fish food products varies by country, but typically involves salting and fermentation. Fermented fish is thought to have originated near the Mekong River and spread to Korea and Japan during China's Han Dynast (Lee & Kim, 2013). Additionally, it was discovered that there were two cultural contexts (macro and micro) in which fermented fish could be studied. The macro context of fermented fish culture is concerned with the current state of fermented food, eco-cultural approaches to fermented food in a particular region and local ways of life (Lee & Kim, 2013). The micro context is concerned with its manufacturing process, ideological worldviews discovered through fermented food production and consumption of each country. Southeast Asian countries such as Cambodia, Thailand, Vietnam, Indonesia, and Laos have popular consumed products of fermented fish in various ways. Indeed, fermented fish food products such as anchovy sauce are also available in some places in Europe. Furthermore, food products of fermented fish constitute an significant portion of the Asian's diet, and its culturally significant areas are closely connected to areas where salt is produced, rice is grown, monsoon climates have distinct dry and wet seasons, and, of course, there is a fishing season (Lee & Kim, 2013).

2.1.2 The Meaning, Significance roles, and Contribution of Processing Fermented foods for Processors and Countries

Fermented foods are widely connected to the production, lifestyles, regional environment, and dietary practices of various regions (Lee & Kim, 2013). As fermented fish products are popularly consumed in Asia, many studies have figured out their meaning, significant roles, and contribution to processors and countries in the regions. The study by Siddhnath et al (2022) shows that fermented foods like dried fish (including fermented fish products) provide a significant amount of critical micronutrients to the diets of the poor in parts of South and Southeast Asia countries, and its production and exchange are important sources of employment and business (Siddhnath et al., 2022). For instance, in developing countries like India, fermented fish products are primarily made from low-cost fish. Consequently, it is essential for sustenance and national food culture (Siddhnath et al., 2022). On the other hand, fermented foods can transform poorly digested, reactive foods into nutritious foods. Additionally, there are numerous instances of fermentation by-products that can be fed to

livestock in a safe manner to supplement their nutrition while also enhancing the livelihood system (Hasan et al., 2014).

The study by Lee and Kim (2016) also illustrated that fermented foods have long been at the heart of dietary culture throughout nations in the Asia region. The products of fermented foods continue to be an important part of global production, trade, diets, and cuisines, notably in the Global South (Belton et al., 2022). Millions of people are employed in fermented foods processing, particularly women, who make up the majority of the food processing workforce in numerous locations (Belton et al., 2022). The study by Materia et al (2021) stated that traditional fermented foods are unique in that they have been a significant part of the diet in every culture since the beginning of civilization. Fermented food provides advantages for both producers and consumers through improving diets and health, and contributing to local livelihood and food security. Interestingly, fermented foods offer significant economic opportunities for processors at the micro and small-scale household level, particularly for women and marginalized groups (Materia et al., 2021).

Some real examples from many countries reflect that fermented foods play significant roles and contributions to a country's economy and culture, particularly in developing countries (Adesulu & Awojobi, 2014). In India, fermented foods are a fundamental part of ethnic heritage (Rawat et al., 2018). Meanwhile, fermented food products play a vital socio-economic role in Nigeria (Oyewole & Isah, 2012). Some of the importance of fermented foods include employment provision opportunities, reduction in mortality rate, industrialization, food security, poverty alleviation, market improvement, food supplement, and food availability (Oyewole & Isah, 2012). Therefore, fermented food plays crucial roles for the producers, consumers, and the country in terms of food preservation, economic value, and cultural heritage value.

2.2 Food and Culture

Food is a crucial part of each individual’s life, and its meaning is larger than survival of people (Sibal, 2018). According to Preucel and Hodder (1996), food is a means for people to interact with each other (as cited in Missagia et al., 2013, p. 153). Indeed, food is an important element in how we perceive and distinguish people, and it also has an impact on people’s culture (Sibal, 2018). Culture is what distinguishes people based on who they are

and where they come from. It encompasses all parts of people's lives including how people communicate and interact with one another (Sibal, 2018).

Different nations have different cultures, and each culture has various kinds of food and ingredients which show the representative of food with their culture (Sibal, 2018). It means that food can transmit the meaning from one culture to another. Conversely, the individual, household level, gender, and power of decision making in the family are key crosscutting to determine the interacting among these channels throughout which culture can affect food, particularly food security (Briones Alonso et al., 2018). Thus, food and culture has a strong connection to each other which includes the religious, tradition, gender, and identity of each group of people in each nation and from one country to another country.

In another way, it was pointed out that food-related activities shape relationships between men and women, and their identities throughout cultures (Cairns et al., 2010). Gender illustrates many of the conceptual and normative aspects of food practices. It was found that gender-specific tasks associated with food production, acquisition, preparation, cooking, and disposal, and the distribution of these tasks varies by culture (Monterrosa et al., 2020). Gender norms always keep women's power from economic and political positions in the public space of food production even though women work in either public or private food production.

In terms of food preparation, women and men are affected by gender norms in various ways. In most cultures, home food preparation is frequently considered women's work rather than men's work. For instance, the division of girls' and boys' chores in the family is divided in different ways. Girls seem to be assigned for cooking and cleaning works in the family, whereas boys seem to be assigned for maintenance works such as lawn mowing, repairing items, or taking out the trash (Cairns et al., 2010). Through this ideology, women often conduct themselves as recognizably womanly, which needs to play a good role in cooking and taking care of all family members. Thus, the imperative to cook for others shows the way that food defines women's identities (Cairns et al., 2010).

Another study argued that dominant gendered discourses continue to shape how these practices are understood even as men become more involved in domestic food work. This is due to the fact that men do not typically cook in a way that is connected to the traditional feminine associations with food, care, and responsibility (Cairns et al., 2010). In the same

meaning of this, gender relations must be understood in the context of larger institutions and social structures. In terms of the food industry, women in many developing nations, particularly in the informal food sector, rely on it as a significant source of income and employment (Grace et al., 2015). Women actively participate in informal markets as consumers, producers, and many other roles throughout the value chain. Women are primarily responsible for preparing food for their families in the majority of developing countries (Grace et al., 2015).

The study on gender and value chain revealed that men and women frequently encounter various barriers to participating in value chains due to gender differences in social norms and access to resources such as land, financial capital, social capital, information, and education (Quisumbing et al., 2015). These distinction result in highly gendered food production, processing, sale, preparation, and consumption processes, with men and women filling a variety of roles along the value chain that are frequently segregated or complementary. (Grace et al., 2015). For instance, men were more active in production and slaughter or collection, while women were more likely to work in processing and retail. In contrast to the fish and dairy value chains, which were gender-segregated, dual-gender tasks were also prevalent in the poultry and livestock value chains (Grace et al., 2015).

In some cases, women and men were segregated in processing and marketing tasks. Some value chains included an important processing stage, which was often dominated by women (e.g producing traditional dairy products and smoking or drying fish in West Africa) (Grace et al., 2015). The study also figured out that men were more likely to sustain occupational injuries while working in livestock production, fishing, hunting, and slaughterhouses. Women were more likely to be exposed to food-borne pathogens while processing, selling, and preparing food (Grace et al., 2015). Through all of these gender roles, it also reflects one part of women's and men's identities in terms of the food value chain. Therefore, food, food production, food preparation, and foodie are all shaped by dominant gender structures that associate femininity, and it is also linked to women's and men's identities.

On the other hand, food practices are primarily passed down from parents to their children. which means that from one generation to the next generation (Monterrosa et al., 2020). Women's and men's attitudes, beliefs, motivations, values, knowledge, and skills, develop when they go through life and are exposed to various social and cultural norms (Monterrosa et al., 2020). In terms of foodways (including food processing, food preparation, sharing, and

consumption) are main elements of second-generation culture in most countries and are significant to maintaining their sense of cultural or ethnic identity. In other words, cultural food processing, preparation, sharing, and consumption practices are deeply ingrained in people's cultural histories and have been passed down through generations (Wright et al., 2021). Despite the fact, that technological advancement has decreased the size of the labor force directly involved in food production at the present, we believe that the deep culture of a society that has been passed down through out generations stems from the traditional techniques of producing food through intensive agriculture, horticulture, raising livestock, and fishing. All whilst, a country's dominant food production method determined its cultural characteristics (Tang, 2017).

The study by Sharif et al (2013) agreed that the transmission knowledge of family food from one generation to the next is an example of informal education, and its process was mostly unplanned and involved mothers and daughters. Conversely, today's youth are not willing to learn and practice their traditional ethnic foods (Shariff et al., 2013). It is very crucial for the ethnic communities to continue and practice their food knowledge to maintain the continuation of their ethnic identity (Shariff et al., 2013). The study of Malay traditional food knowledge by Sharif et al (2013) illustrated that food knowledge transmission can spread accidentally and without intention. Within little motivation and inspiration from parents, family members, neighbors, senior communities, young generations can cultivate an interest in acquiring and practicing traditional food knowledge. In addition, regular practice and knowledge sharing through communication are critical components to ensure that traditional food knowledge is preserved for future generations. Family food traditions should be maintained and developed along with social and technological advancement (Shariff et al., 2013).

2.3 Food and Consumption

In daily life, different people have different option and perception in terms of food and amount of consumption. Food choice and food preference are often seen in the relationship between food and consumption (Bartkiene et al., 2019). Regarding food choice, there are some factors that can affect consumer food choices such as social status, gender, age, education, knowledge about healthy eating and attitude to food (Bartkiene et al., 2019). These elements may lead to the creation of new food product technologies as well as foods with fresh flavors, textures, and flavours in an effort to enhance the variety of foods on the market

(Bartkiene et al., 2019). In terms of food preference, gender is a significant factor that often emerges and influence in food preference among consumers (Fiala et al., 2015). For instance, men normally preferred ethnic foods, meat, and fish, whereas women preferred starchy and sweet foods, fruits, and vegetables (Fiala et al., 2015). Another example, men were less picky about healthy food than women, and their food consumption was generally higher (Fiala et al., 2015). However, there were some instances where the observed variations in food preferences did not correspond to actual consumption (Fiala et al., 2015).

Some studies claimed that preferences as an important factor in determining consumption (Brug et al., 2008; Pérez-Rodrigo et al., 2003), whereas others did not find any correlation between preference and consumption (Iglesias-Gutiérrez et al., 2008). The study by Fiala et al (2015) found that low preferences do not automatically mean low consumption. Conversely, consumption might actually increase compared to highly rated preferences (Fiala et al., 2015). Another finding of this study also showed that preferences do not have to be the most significant factor in determining consumption though children and adolescents are expected to "eat primarily what they like" (Fiala et al., 2015). On the other hand, increasing consumption of items with low preferences may be depending on a variety of factors such as certain foodstuffs, a person's knowledge of a particular food item's overall value and health benefits or a combination of these factors (Fiala et al., 2015).

The study by Lazaridis and Drichoutis (2005) argued that preference differences are more major factors of consumption levels than income and food availability. Indeed, food prices have little impact on consumer preferences. Generally, while income and prices play an important role in shaping differences among countries, their importance diminishes as other factors (cultural differences, differences in tastes, information, demographics, etc.) increase (Lazaridis & Drichoutis, 2005). While prices are still important in explaining food demand, as people become more prosperous, income and prices play less of a role in food purchasing decisions. It means that each consumer's diets, preferences, and tastes are all vary (Lazaridis & Drichoutis, 2005). Trends such as rising obesity, a large portion of food budget spent outside the home, aging populations, an increase in households with all adults working outside the home, and increased consumption of functional and organic foods are reshaping food demand both inside and outside the home (Lazaridis & Drichoutis, 2005).

The study by Kearney (2010) revealed that food consumption are all influenced by a variety of factors, including geography, demography, disposable income, socio-economic status,

urbanization, globalization, marketing, religion, culture, and consumer attitudes. Particularly, increase in income or lower prices have resulted in increased consumption of animal-based and processed foods (Kearney, 2010). While well-educated people can choose to live a healthy lifestyle, the poor have fewer food options and less access to nutritional education (Kearney, 2010). Urbanization has numerous consequences, including new and improved marketing (with greater access to modern mass media), distribution infrastructure, the attraction of large supermarkets dominated by multinational corporations, and improved transportation systems, all of which improve access to foreign suppliers and the importance of imports in the overall food supply (Hawkes, 2006).

Rapid urbanization has had and continued to have a significant impact on food consumption patterns (Kearney, 2010). In addition to increased consumption of modern processed foods in developed countries, developing countries are creating processed versions of traditional dishes (Kearney, 2010). As a result of the globalization of food systems, traditional diets in developing countries are being transformed as more meals in the fast-food calorie-rich pattern of developed countries become available, and these are becoming increasingly abundant and cheap due to advances in food processing and modern technology (Kearney, 2010). Furthermore, consumer attitudes and behavior also influence on food consumption (Kearney, 2010).

On the other hand, the differences in food consumptions can also be found in relation to age (Casini et al., 2015). For instance, younger adults frequently devote less time to food preparation (Casini et al., 2015). They are also distinguished by a higher consumption of foods consumed away from home. This characteristic is related to the different lifestyle of the younger generations, which is projected toward more social and working activities outside of the home, leading young people to increase their consumption opportunities outside of the home (Casini et al., 2015). Concerning health, middle aged and elderly individuals tend to be more health-oriented than young people (Casini et al., 2015). Therefore, food habits and consumption are linked to the characteristics of the family unit.

In the sense of fermented food like Kimchi, it was reported that Kimchi consumption has recently declined due to a number of social changes (Kim et al., 2007). In addition, it was noticed that Kimchi is a special traditional food from Korea, which is no longer as well known or as preferred (Kim et al., 2007). This raises some doubts. The majority of eating habits are formed before adolescence and are greatly influenced by foods consumed at home

as a child and as an adolescent, which then affects subsequent food choices (Kim et al., 2007). According to a study on kimchi consumption patterns during the growing season, eating kimchi is recognized as being beneficial to one's health and a traditional dish (Kim et al., 2007).

Kimchi production has already declined, while the market for commercially produced Kimchi has raised (Kim et al., 2007). Kimchi production and consumption have been impacted by changes in dietary habits (Kim et al., 2007). Kimchi consumption has gradually reduced as traditional home-made Kimchi has given way to commercialized and industrialized Kimchi (Kim et al., 2007). According to the statistical findings in the market acceptance of commercially produced Kimchi, respondents believed that it was convenient, more hygienic, maintained good taste, and degree of fermentation (Kim et al., 2007). As the market for commercially made Kimchi has grown and the proportion of home-made Kimchi has steadily declined, it is a key challenge to expect that the next generation will learn how to make Kimchi (Kim et al., 2007).

Currently, Weidhaas (2013) showed that the average consumption of Kimchi declined among all general characteristics (gender, age, residential area, marital status, job status, education level, and household income). In particular, Korean women in adult ages expressed significantly reduced average consumption of Kimchi in their dietary (Weidhaas, 2013). The reason for this is that most of them changed their ways of eating, such as skipping breakfast, frequent having meal outside, smoking, and consuming alcohol (Weidhaas, 2013). Additionally, the changes of social and economic contexts result in more working women, higher household incomes, an increase in the number of single-parent families, and greater access to fast foods and outside meals, the traditional Korean diet of rice, soup, side dishes, and kimchi has given way to a more Westernized eating pattern. (Weidhaas, 2013). Thus, this shift in dietary habits is linked with a general decrease in daily consumption of Kimchi among young adults.

The same things, Kimjang is a kind of Kimchi that demonstrates the sharing culture and sense of community that are part of the Korean tradition of making Kimchi (Surya & Lee, 2022). At the present, Kimjang faces numerous challenges due to modernization of foods, which may jeopardize its survival (Surya & Lee, 2022). Intensive farming has made it possible to grow cabbages and radishes all year long, regardless of the seasons (Surya & Lee, 2022). As a result, almost year-round, even in the winter, kimchi is always available at the market

(Surya & Lee, 2022). Furthermore, the declining number of people in Korea, modern living lifestyles, fewer family members, and a convenience-oriented ways of life have made Koreans currently reducing Kimjang consumption (Surya & Lee, 2022).

Similarity to Kimchi, fermented fish plays a significant role in Asian culture and cuisine. The market and production of fermented products in a country are effected by the people's eating habits and market demands (Essuman, 1992). In developing countries of Southeast and South Asia, there is a good market and large consumers for fermented fish products (Narzary et al., 2021). The seasonal availability of fish and its scarcity during the long dry months have been the primary reasons for fish fermentation in these regions since ancient times (Narzary et al., 2021). However, these products are typically made at the family or village level in the region and using traditional methods (Narzary et al., 2021). Thus, the limitation of quality, technology, people's life style, and preference also lead to change consumption patterns of fermented fish among people in Asian countries (Narzary et al., 2021).

2.4 Women's Food Enterprises

In the food sector, women are typically more responsible for ensuring nutrition, food safety, and food quality. They are also frequently in charge of processing and preparing food for their households and the national economy. However, some studies show that women's food production or selling business shapes their identity and vice versa. Before going into detail on this issue, I want to review the concept of identity which refers to this part. The literature on identity is vast and covers a variety of disciplines. Shortall (2014) also agreed that identity shows who we are, who others are, and us knowing how the other person understands their identity. Social interaction shapes identity, and identity formation, like gender, is a process of doing (Shortall, 2014).

There are various types of identities, which can be linked to roles (for instance, occupation), groups and categories (nationality, gender), and our personal characteristics (kind, honest). Couples are extremely important sources of identity verification (Shortall, 2014). A significant amount of research has been conducted on how the farm shapes the farm family, gender roles, and the identity of family members (Shortall, 2014). Likewise, women's food enterprise or food production often shapes their identity and conversely.

As food production has a strong connection to culture and social tradition, women's food

enterprise or food production often shapes their identity through these two factors (Mazonde, 2016). In general, entrepreneurship is defined by cultural and social traditions (including gender norms (Mazonde, 2016). Zampetakis (2016) also argued that the image of the entrepreneur has historically been masculinized and rooted in masculine discourse. For example, women in some countries were restrained from starting or owning their business or establishments due to the social circumstances, and it sometimes force them to perform their activities in a different way than men (Mazonde, 2016). Allen and Sachs (2007) also states that social relations of food have been organized along gender lines. It was found out that the worldview for female entrepreneurs appears promising and their potential for economic growth and job creation is substantial (Rao, 2014).

However, their efforts to fully engage in entrepreneurial activities are hampered by a variety of limitations and many of these connect to gender norms (Mazonde, 2016). Gender influences employment decisions, business location, and business focus, all of which affect competitiveness and access to funding (Mazonde, 2016). Shinnar et al (2012) show that there is gender differences in women's entrepreneurial experiences, including their business performance. In fact, women's identities are shaped by their entrepreneurial experiences in accordance with their context and are constrained structurally by gender discrimination. Having said that cultural beliefs can also influence societal gender roles and stereotypes regarding occupations appropriate for women (Shinnar et al., 2012).

In the context of food production, women's food involvement shapes who they are in the world as individuals, family members, and workers which are found in complex and frequently contradictory ways (Allen & Sachs, 2007). Relating this issue, many scholars of food studies disagree on whether women's food work gives them power in the family or reinforce their subordinate gender role ways (Allen & Sachs, 2007). For instance, women perform the majority of food-related work, but they have little power in both household and social levels. Anthropological research into different countries, regions, and ethnic groups illustrate how women construct their identities, cultures and class positions through food work (Allen & Sachs, 2007). It means that the integrations of gender, race, ethnicity, and class define what kinds of work and conditions that men and women should perform in the food production (Allen & Sachs, 2007).

Women's works related to food reflect their familial ties while also upholding cultural traditions that are central to many women's identities (Allen & Sachs, 2007). However, food

productive work is usually prioritized by men, while women are required to juggle the two types of tasks (Household chores and child care) that shape the different benefits such as well-being, time being, wage gap, and identity of women (Weeratunge et al., 2009). Thus, food and all that its production entails is significant source of self-worth and value for many women of various cultures, but it also shapes identity of women throughout cultural belief, social tradition, and gender disparity.

Conversely, many studies argued that the identity of women shapes women's food production or food businesses. Chasserio et al. (2014) differentiated between private social identities (such as parents and spouses) and public social identities (such as occupational identity or citizen identity). He also revealed that women's traditional social identities are primarily associated with the private sphere: mother, wife, daughter, or sister (Chasserio et al., 2014). Furthermore, within the domains of traditional social identities, women are supposed to take on specific feminine roles and tasks (caring for and nurturing children, maintaining the household, supporting the husband) (Mazonde, 2016).

Similarly, entrepreneurship discourse is analogized to a masculine viewpoint in which women are valued less than men and regarded as something other than entrepreneurs, and are assumed to be responsible for the household sphere. As a result, women must master new social identities (mostly masculine) and new roles while maintaining their traditional social responsibilities (Mazonde, 2016). Women business owners faced numbers of tension as they try to reconcile their identities; these frequently include conflicts between the role of entrepreneur or business owner and social norms based on their gender (Weidhaas, 2013). Furthermore, by studying research on women business owners and the history of women specifically in food production and generally in the workforce, we can see that additional pressures for women, such as work/life integration and household obligations are emerging. It was proposed that entrepreneurship provided a way for women to avoid traditional workplaces that devalued women or placed extra pressure on women who tried to balance home and work responsibilities (Weidhaas, 2013).

As we have been discussing, women entrepreneurs face many challenges to their personal identity. Particularly, the issues related to addressing the needs of family and work burdens, as well as moral attacks linked to the decisions they make about how to construct their work/lives (Weidhaas, 2013). Many scholars show that push and pull factors are the reasons why women-owned businesses choose entrepreneurship as their occupational choice

(Weidhaas, 2013). For instance, a woman may be forced to leave a traditional workplace due to an inflexible timetable that limits her ability to care for her family. Indeed, women-owned businesses often struggle to balance their family's work and career (Weidhaas, 2013). Zampetakis et al (2016) also agree that an individual's identity in general, and gender identity (or related gender roles) in particular, can contribute to significant differences in entrepreneurial behavior between men and women. Gender identity influences how entrepreneurs see themselves, how they perceive the world around them, and how they interact with others, as well as what they hope to achieve in the future (Zampetakis et al., 2016). Therefore, women's food enterprise or food production often shapes their identity and conversely.

2.5 Women and Men in (fermented) Fish Processing

Generally, fermented food processing is women dominated which can be seen as household activities and shifting production and sales away from the household level. This action resulted in women shifting away from predominantly women processors in households and toward male-biased small-scale production systems (Materia et al., 2021). Fermented food processing represents an area dominated by females, with knowledge passed down through generations (Materia et al., 2021). Through traditional processing of fermented foods, women processors can make a significant contribution to local, national, and global food security, economic growth, and added value at the local level. Consequently, women's income from producing fermented foods can contribute to the needs and livelihood of their family and saving (Materia et al., 2021).

In the context of (fermented) fish processing, women play a significant role in the aquaculture value chain of the Asian region in general and dried fish processing in particular. For instance, thousands of women have worked in the fishing industry throughout history and across nations (De Silva, 2011). Women play a major role in subsistence and small-scale fishery production, particularly in primary production schemes. Moreover, women are the keepers of traditional fish processing and preservation techniques (De Silva, 2011). As a result, they perform an essential role in the transmission of knowledge from one generation to the next generation (De Silva, 2011). However, women's contributions to the fish value chain are frequently overlooked, and the true benefits of their participation in the activity are not selected for further assessment (Rabbanee et al., 2012). Due to cultural barriers and household duties, women's roles in the processing process are prominent inside the

processing factories as processing labor whereas the supervisory roles are mainly done by males (De Silva, 2011).

Even though women play vital roles in (fermented) fish processing, many studies figured out and discussed gender issues that often emerged in the processing process across the countries. The study by Lwenya and Abila (2019) on women's and men's roles in fish processing and trading in Kenya shows that the majority of fish traders and processors were females. According to the findings, most females work in fish processing and trading because it is a family business, an area of their living, and it requires little capital to start the business (Lwenya & Abila, 2019). Indeed, the results of the study also expressed that women fish processors and workers often received less attention from both government and factories though women play a major role in fish processing (Lwenya & Abila, 2019).

Similarly, the study by Thorpe et al (2014) found that there is a gender division of labor in fish value chain production in general and the processing process in particular. For example, while most women are dominated in fish post-harvesting processing, most of them are divided to work in fish processing rather than other parts such as marketing, logistics controlling, and so on compared to men workers (Thorpe et al., 2014). This gender inequality is limit women to access new knowledge and skills, training, resources, and wage gaps as well (Thorpe et al., 2014). In other words, gender identity, roles, and relationships in the labor market and household (and community) have negative impacts on women in terms of property accumulation, entrepreneurship, marketing opportunities, social capital, and social norms (Thorpe et al., 2014).

Besides gender issues, women in small-scale enterprises and workers in fish processing also faced many challenges in their jobs and business. Regarding women in small-scale enterprises or traders, most of them face difficulties in terms of access to capital, power, upgrading skills, technology, market, imbalance in income-generating activities with household work, cultural and environmental changes, and lack of fund support from the government and other relevant organizations (Okorley et al., 2004; Siason et al., 2002). Respecting women workers, many of them face some challenges such as poor working conditions, household care burden, wage gaps, limited opportunities to gain new knowledge and skill, and so on (Manyungwa et al., 2019). Based on the above literature review, it shows gender differences in how men and women involve and invest in food processing and food security respectively.

2.6 Fish Processing in Cambodia

2.6.1 Overview of (fermented) Fish Processing in Cambodia

Tonle Sap Lake is one of Cambodia's most significant natural resources which provide plenty of freshwater fish and job opportunities for Cambodian people who have lived around the Tonle Sap Lake, particularly for those who live in Pursat, Kampong Chhnang, Battambang, Siem Reap, and Kampong Thom province. The lake has a surface area of 250,000 hectares during the dry season, and it is Southeast Asia's largest freshwater lake (Aldin-Lundgren et al., 2008). Normally, people in those areas usually caught a large number of fish from the lake during the peak season to process dried fish such as fish paste (Prahok), fermented fish (Pha-ork), sweet fish (Mum), smoked fish, and fish sauce for their consumption and selling (Aldin-Lundgren et al., 2008). Among these kinds of dried fish, Prahok has been recognized as traditional and popular fermented food for Cambodian people which has been produced for centuries in the wider areas of Cambodia (Aldin-Lundgren et al., 2008).

Fish processing, as a part of the fisheries sector in Cambodia, plays an important role for Cambodian people and the country's economy. For instance, the processing of prahok and fish sauce can offer food security and income for Cambodian people in either fishing or non-fishing communities (Aldin-Lundgren et al., 2008). In Cambodia, post-harvest distributions as well as processing are both largely dominated by women while men are commonly seen in almost every part in the fisheries sector. In Cambodia, 57% of women are involved in the fisheries sector (Kusakabe, 2014).

In terms of fermented fish paste (Prahok) processing, Prahok is a salted and fermented fish that carries more than three months to produce and is a famous ingredient in Khmer cuisine (Norng et al., 2011). There are two kinds of prahok products that Cambodian fish processors produce including boneless and bony prahok (Nam et al., 2009). Many small-scale and medium-scale households and modern/industrial-scale prahok processors are located in the provinces surrounding the Great Lake, which include Siem Reap, Battambang, Kampong Chhang, Kampong Thom, and Pursat provinces (LeGrand et al., 2020). In 2013, official production records of at some larger scale modern processing facilities indicate that more than 15,000 tons of prahok was produced in some potential areas of Cambodia including Siem Reap, Battambang, Kampong Chhang, Pursat, Kratie, and so on in purpose for domestic and export market (LeGrand et al., 2020).

A significant proportion of traditionally processed prahok is produced by small and medium-scale processors at the household level for domestic consumption, especially for Cambodian people who live in floating villages and surrounding areas of Tonle Sap lake (LeGrand et al., 2020). Among these areas, Kampong Chhnang province has the largest amount of small-sized prahok processing and also has many floating people (Sophea et al., 2010). During the peak season, most small and medium-scale processors can make prahok from 15 to 20 kg per day (LeGrand et al., 2020). The national potential markets of prahok include Phnom Penh capital, Kandal, Prey Veng, and other provinces in Cambodia (Sophea et al., 2010).

The fish processing techniques of Cambodian processors are different in various areas and scales. Regarding the general fish processing size in Cambodia, there are four main scales of fish processing practices: micro, small, medium, and large scales (Nam et al., 2009). Relating fermented fish (prahok) processing techniques, it is divided into two categories and will be used depending on different facilities and quality products: traditional and modern techniques. Firstly, traditional techniques can be divided into 3 groups: (i) small-scale technique (It is a common practice for Cambodia people who prefer to produce dried fish depending on seasonal fish catch, and it is done at the family level for purpose of home consumption.), (ii) medium-scale (Families who frequently reside close to fishing villages, lots, and landings perform it for the purpose of selling rather than for home consumption. Their processing is operated by using family's labor, their relatives, and some hired laborers during the peak season.), (iii) and large-scale (In general, the processing is carried out by fisheries enterprises and fish sauce factories and using a large number of labor between 40 and 60 workers.) (Nam et al., 2009).

Secondly, modern processing techniques are also divided into 3 groups: (1) small-scale (The annual fish input is less than one ton which is produced by households. Their production is for both consumption and selling, and there is no license requirement.), (2) medium-scale (The annual fish input is less than fifty tons. The majority of their production is for commercial purposes, and it is required license.), (3) and large-scale (The annual fish input is always more than fifty tons with large investment, and it is also required license.) (Nam et al., 2009). Therefore, the different places or provinces may have various experiences of small-sized fish processing (prahok) practice.

2.6.2 Women and Men in Fish Processing in Cambodia

Cambodia is also the same with other countries in Southeast Asia that women are often dominated in fish processing, especially at the level of micro and small-scale households fish processing (De Silva, 2011). In this sense, women take a vital part in the fish processing activities. Even though both Cambodian women and men engage in fish processing, the work is often suitably and preferably done by females. Thus, Cambodian women's involvement is often seen as oriented on fish processing (De Silva, 2011).

The study by Nam and Bunthang (2011) shows that many Cambodian women are actively engaged in inland fisheries around the Tonle Sap lake including fishing, fish cage operation, fish grading, fish processing, fish selling, and fishing gear and fishing equipment construction and repair (Nam & Bunthang, 2011). The findings of the study also found that Cambodian women's role and engagement in fisheries are not recognized as significant due to women not going out for fishing like men. Most of them often get less support in terms of training and extension services. Indeed, documentation on their participation in inland fisheries is limited, undependable, and does not reflect their importance. Furthermore, traditional gender roles in Khmer society also a key challenge for women in participating in the fisheries sector (Nam & Bunthang, 2011). The study by Siason et al (2002) also states that Cambodian women have limited education and lack basic skills. For instance, males outnumber females in terms of higher education. Thus, all of these issues limit opportunities for women to take action in fish value chain, particularly fish processing process comparison with men.

In terms of fish processors, Cambodian women and men fish enterprises also face some challenges in the practices of fermented fish processing. De Silva (2011) illustrated that Cambodian processors often face difficulties in high cost of water and electricity, lack of support industries (e.g. packaging materials and processing machinery), lack of quality control, poor information on domestic and foreign markets, poor technology and equipment, lack of capital, low level of education and technical skills, high informal taxes, poor research and development infrastructure, and lack of trained human resource in food-processing. Similarly, the study by Ratha et al (2021) also claimed that poor knowledge and technology on fishery products, changes of prices and raw material, slow adoption of sellers/processors to new technology, limited local material supply to support the production chain of fish, and climate change are key challenges for Cambodian processors for producing fish products. Regarding fermented fish (prahok) processors, prahok processors in Cambodia often face two main problems including high price of salt and increasing price of inland small-sized fish

(fresh fishes). Besides, they also faced technical problems and low price of small-sized fish prahok (De Silva, 2011).

2.7 The Important Roles of Fish Processing for Cambodians

Notably, fish processing plays significant roles for Cambodian livelihood, especially for poor people and women in terms of food security, nutrition, source of income, and cultural preference (Gayathri et al., 2020). In terms of prahok it is a necessary ingredient among other fish products in a wide range of dishes of Cambodian diet throughout history and food culture in the country. Fermented fish paste (Prahok) is also an essential part of food nutrition and security for rural families. In Particular, Cambodian people consume an estimated 18 g of prahok per capita per day (LeGrand et al., 2020). In addition, prahok processing and sale is an important source of income, particularly for families or widows with limited earning potential from other sources (LeGrand et al., 2020). Another role of prahok, prahok is often provided for donations to victims of flood or drought by charities and other organizations due to ease of store and preservation (Norng et al., 2011). Furthermore, dried fish like prahok is considered as a traditional fermented food, food culture, and identity of Cambodian people across the locations (LeGrand et al., 2020).

2.8 Gender Issues among Cambodian Women and Men in Fish Processing

In Cambodian fish processing, women are overrepresented in the fish processing industry, particularly in small-scale operations. However, women's roles and values are not recognized due to social and gender constraints. Generally, processors commonly experience higher losses than others amongst value chain actors, and among them, processors as women are more at risk of losses than men such as lack of mobility, lower bargaining power, time poverty, and vulnerability (Cole et al., 2018). Based on these constraints, most women processors usually rely on low-quality raw materials that are more likely to result in losses (Diei-Ouadi et al., 2015).

The study by Kusakabe (2014) argued that gender norms and roles keep Cambodian women sedentary and make barriers to them to be involved in business and new markets. The study also suggested that it is better to organize women processors (small-scale entrepreneurs) in ways that can change social and family power relations for their benefit through analyzing the power relations of their daily lives as well as their resources (Kusakabe, 2014). On the other

hand, systematic gender discrimination is also limited women access to education, new knowledge, resources, fair income, engagement in associations or networks, decision making, representation, and ability to policies and regulations (Alonso-Población & Siar, 2018). This sense links to the situation of fish processing and fermented products in Cambodia. Most Cambodian women processors often face some key constraints such as lack of entrepreneurship, lack of credit, government intervention and support, poor market development, a shortage of qualified labor, and inadequate technology (UNIDO & FIA, 2021). In addition, the gender division of labor appears to indicate that women manage the majority of tasks requiring process knowledge, such as selecting, sorting, salting, smoking, and managing fish fermentation (UNIDO & FIA, 2021).

Gender division of labor is also a key constraint for women to gain other skills as well as unequal income and health problems. Women's processing tasks, in particular, expose them to a number of risks, such as smoke causing eye, lung, and back pain, and they sometimes miss lunch and sleep due to the nonstop nature of the work process (UNIDO & FIA, 2021). Furthermore, gender division of labor also indicates that women normally are supposed to have good knowledge and skills related to the post-harvest sector while men are supposed to participate in transport or tasks that require particular physical strength, or support women in their work rather than doing tasks in process knowledge (UNIDO & FIA, 2021). Thus, complementarity is a benefit for businesses, but women enterprises may be disadvantaged because they lack manpower and mobility. Through the above literature review, we can know that gender norms and perspectives affect women's and men's processing tasks in various ways. Additionally, it generates a large burden for women in terms of imbalance between productive and reproductive work.

2.9 Conceptual Framework

The figure 2.1 below shows the conceptual framework of this study. To investigate the experiences of changes in producing prahok among prahok makers, this study started to look at the influential factors that affected the production of prahok. The initial idea of this starting point is informed by the literature review. The information from the literature review showed that prahok production is often affected by the increasing price of inputs, lack of capital, and market challenges (De Silva, 2011). All of these key constraints caused matters on prahok production among Cambodian fish processors, especially in processing prahok. The influential factors might directly affect prahok production and indirectly affect prahok

consumption in the household of prahok makers through the changes in their prahok production.

The study by Nam and Bunthang (2011) revealed that traditional gender roles in Cambodian society were key constraints for Cambodian women in engaging in the fisheries sector in general and fish processing in particular. Their study also showed that Cambodian women's roles and engagement in fisheries are not recognised as significant due to women not going out fishing like men. In addition, another study illustrated that women normally have limited access to resources, education, fair income, engagement in associations or networks, and decisions making in their households and careers (Alonso-Población & Siar, 2018).

Thus, this study aimed to look at production patterns, the amount of producing prahok, gender roles, and decisions making in prahok production to examine and understand the changes in prahok production among prahok makers. Similarly, this study also looked at prahok consumption patterns, the amount of prahok consumption in the household, gender roles, decisions making in the household of prahok makers to examine and understand the changes in their prahok consumption. As prahok consumption in the household of prahok makers is closely linked to their prahok production, this study also looked at how the changes in prahok production patterns might affect prahok consumption patterns. The experiences for changes in prahok production and consumption of each prahok maker might also come from different reasons. The study by Weidhaas (2013) revealed that women-owned businesses often struggle to balance their family's work and career, and are constrainted by gender norms. This study also supposed that lack of time, gender stereotypes, household economic matters, changes in food preference, health issues, and so on might be other reasons that prahok makers decided to change their prahok production and consumption.

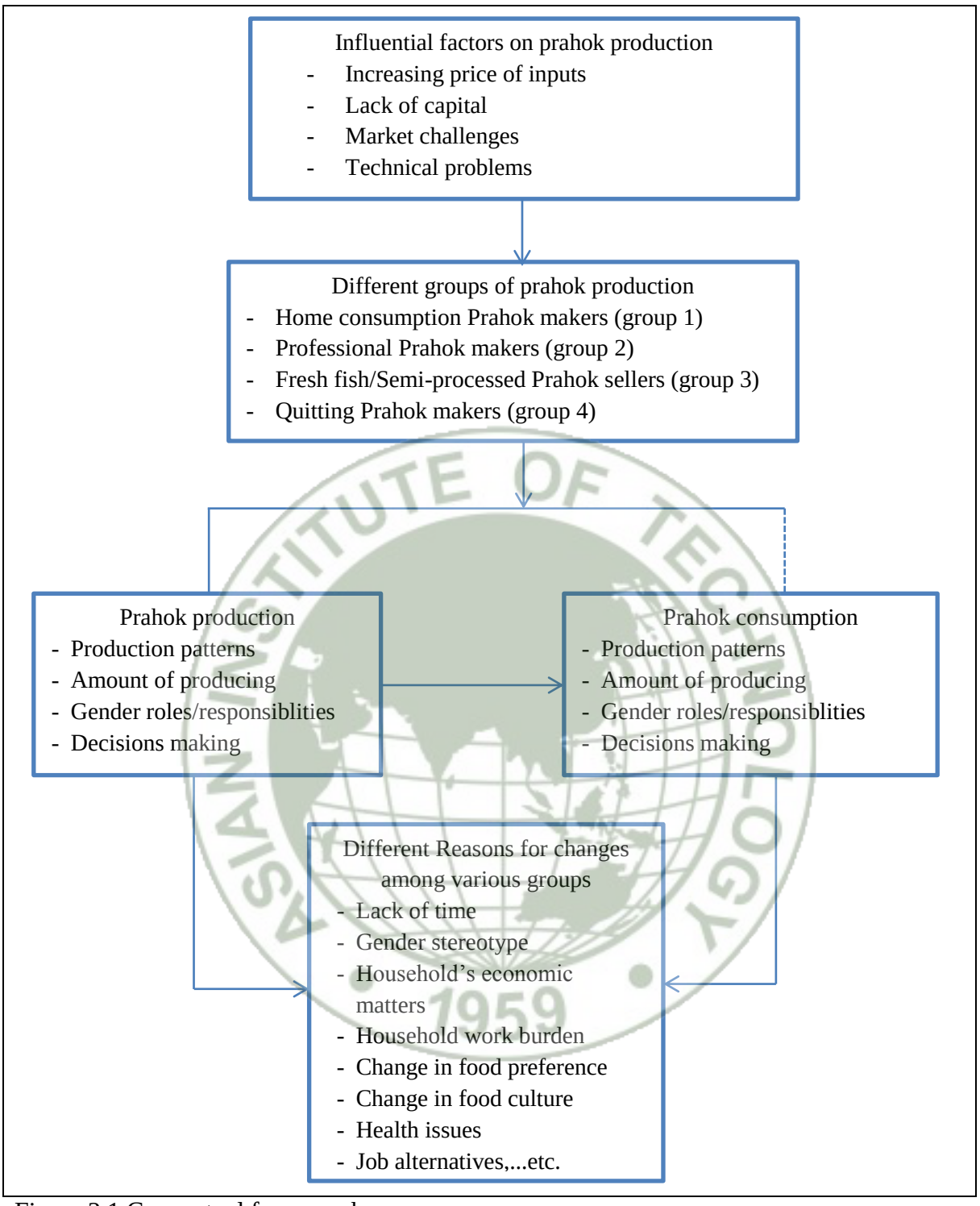

Figure 2.1 Conceptual framework

CHAPTER 3
METHODOLOGY

The chapter aims to illustrate and explain the methods of how the study was conducted, collected, and analysed to obtain the objectives of the research. There are eight sections in this chapter including the research method, selection of study sites, selection of respondents, data collection strategies, data analysis, ethical consideration, limitation of the study, and research design tools. The detailed explanations of these sections were presented as following.

3.1 Research Method

The qualitative method (phenomenology) was applied in this study to understand how the changes in prahok production and consumption among prahok makers are affected by and led to different perceptions of women for these changes. Rossman and Rallis (2016) suggested that "phenomenology explores the meaning of individual lives experience, through the intensive and in-depth interview" (p.187). Within this tradition, it was applied to document the experiences, feelings, and perceptions about the changes in fermented fish paste production and consumption among prahok makers in the study areas. The semi-structured in-depth interview was used as a primary for gathering data in this study. There were two main purposes that this qualitative study was used to achieve. Firstly, the qualitative method was applied to document the changes in patterns in prahok production and consumption among prahok makers across areas of the study, and further figured out the factors that affected prahok production and consumption among prahok makers. Secondly, the qualitative method was applied to explore the reasons for changes in prahok production and consumption patterns among prahok makers, their feelings, and their perceptions about the changes.

3.2 Selection of the Study Sites

Among five provinces (Kampong Thom, Kampong Chhnang, Siem Reap, Battambang, and Pursat) that are located on and around the Tonle Sap Lake, two provinces were selected for the study areas: Siem Reap province and Kampong Chhnang province. There were two villages were selected from Kampong Khleang commune, Soutr Nikom district, Siem Reap province namely: Mok Wat village and Preaek Sramaoch village. Another study area, one

village was selected from Chhnok Tru commune, Baribour district, Kampong Chhnang province which was known as Chhnok Tru village. All these three villages were known as the gathering places of fishers and fish processing, especially fermented fish paste (Prahok).

In addition, these three villages have some characteristics in terms of geographical locations and access to fish resources. Preaek Sramaoch village (seasonally flooded village/village 1) is located on the flooded plain area of Tonle Sap Lake, and the area does not have good access to fish resources during the dry season. Mok Wat village (Seasonally flooded village/Village 1) is located on Tonle Sap water for 6 months and on the land for 6 months. This area has good access to fish resources during the rainy season, but it also has some difficulties in the dry season for access to fish resources. Chhnok Tru village (Displaced village/Village 2) has been known as a displaced area and has many difficulties in access to fish resources at the current time. Before relocation, the area was a floating village (floating on the water for a whole year) and had very good access to water body and fish resources.

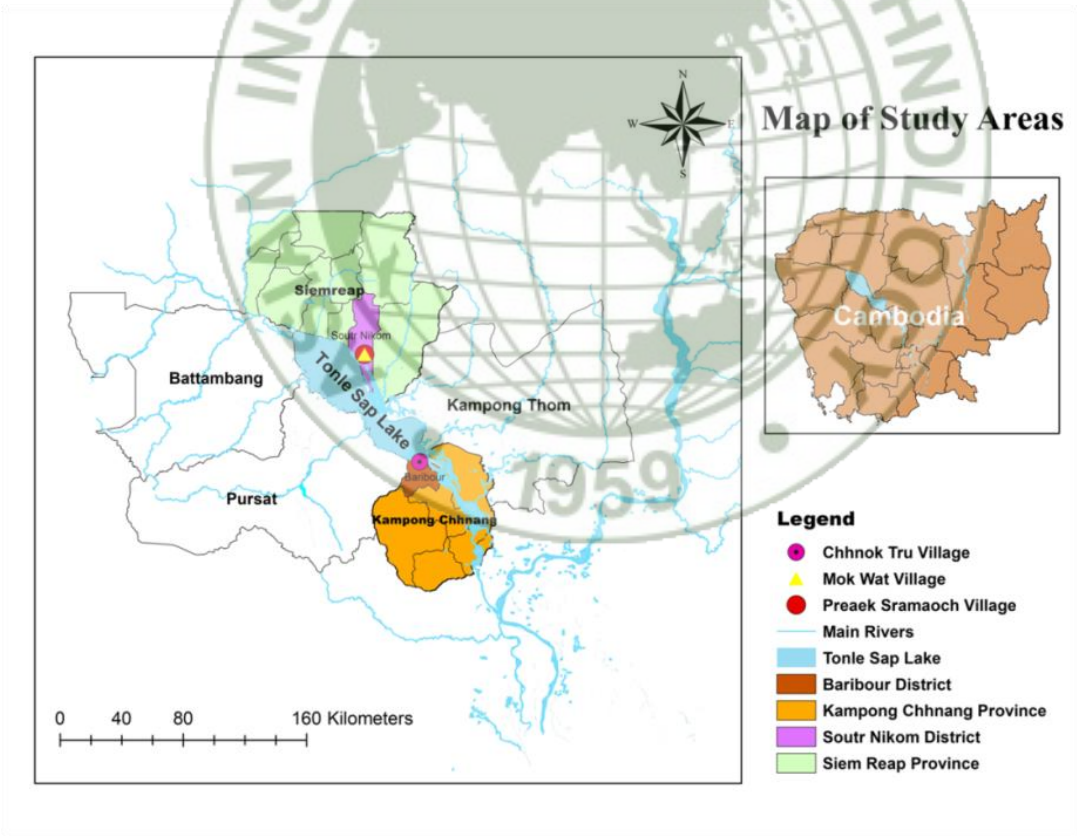

Figure 3.1 Map of the study areas

3.3 Selecting of Respondents

Purposive sampling was applied to choose participants for this study. There were 31 respondents in total who took part in this study, and 20 of them were female respondents (Table 3.1). Based on the information from KII in each village, it was shown that the total number of households who currently engage in producing prahok in Preaek Sramaoch village is from 10 to 15 households. The total number of households who currently engage in producing prahok in Mok Wat village is around 35 households while there are approximately 20 households of prahok makers in Chhnok Tru village. Thus, there were 10 respondents were conducted in Preaek Sramaoch village (V1), whereas 10 respondents and 11 respondents were conducted in Mok Wat village (V1) and Chhnok Tru village (V2) respectively. According to the information on the total number of prahok makers in each village, this study realised that the data from the selected number of respondents in each village could represent the prahok production and consumption among people in each village and enable obtain enough information in order to achieve the objectives of the study. In addition, this study observed that the number of selecting respondents in each village reached saturation in which there was no other new information came out after interviewing 10 or 11 respondents per village.

Among 31 respondents, there were various varieties of respondents in this study including males, females, young people, middle-aged people, old age people, married, widowed, less experiences in engaging in prahok production, and numerous experiences in engaging in prahok production. Indeed, all male and female respondents were over 18 years old. Female respondents were persons who used to make prahok at household levels (micro and small-size productions) for either consumption or selling. The respondents who currently start producing prahok, but they never made prahok before were excluded from this study. Remarkably, male respondents in this study were selected from those households whose wives are prahok makers. This is because prahok productions are dominated by women. Even though men do not directly engage in prahok production, men's perceptions see women's activities in prahok production are also important for this study. In the fisher households, men are often household heads and play important role in earning income to support the family. Therefore, this study also chose to interview men whose wives are prahok makers. The data from male respondents were used to examine men's perspectives on the engagement of women in prahok production according to the changes in prahok production in their

households. In addition, the data from male respondents were also used to examine their perceptions about the factors that affected prahok production, analysed gender roles and decisions making in prahok production and consumption in the household.

Table 3.1 Number of In-depth Interview Participants

Sex of participants	Number of participants
Female	20
Male	11
Total	31

Source: Field survey, 2022

3.4 Data Sources and Data Collection Techniques

The main data sources for this study were primary and secondary sources. To gurantee the accuracy and dependability of the study's findings, both set of data are used. The study used semi-structured in-depth interviews to gather data, which was then transcribed, coded, and thematically analysed to obtain study's objectives. The detailed descriptions of primary and secondary data in this study are presented in the sub-sections below.

3.4.1 Primary Data

The primary data was collected through field surveys in the target areas of the study. It was the main information of the research that was gathered throughout numerous methods: in-depth interviews, key informant interviews, and field notes. The primary data in this study was collected from mid-October 2022 until the end of December 2022.

a) Key informant interviews

Key informants interviews were conducted with potential persons including village heads, the chief of the fishery network, and the leader of the fish processing team through semi-structured questionnaires to collect general information about the study areas. The total numbers of key informants interviewed in three villages were six respondents, of which two potential persons from each village were conducted. In addition, informed consent was used for key informant interviews in this study to protect the rights of the respondents. The informed consent and confirmation were informed and confirmed beforehand before having a

meeting, discussion, and interviewing with the key informants. The numbers of key informant interviews is shown in Table 3.2.

Table 3.2 Numbers of Key Informant Interviews

No.	Job's Position	Nationality	Working's Location
1	Village head	Khmer	The local authority in Preaek Sramaoch
2	Leader of Preaek Sramaoch fish processing team	Khmer	The fish processing group in Preaek Sramaoch
3	Village head	Khmer	The local authority in Mok Wat
4	Former village head	Khmer	The local authority in Mok Wat
5	Village head	Khmer	The local authority in Chhnok Tru
6	Chief of Fisheries Network	Khmer	The fisheries network group in Chhnok Tru

Source: Field survey, 2022

a) In-depth Interview

There were 31 respondents was conducted through semi-structured in-depth interviews. The semi-structured in-depth interviews was a primary method to collect detailed information related to the changes in patterns in prahok production and consumption among prahok makers in the Tonle Sap Lake, explore the affecting factors, figure out and analyse the reasons for changes in prahok production and consumption patterns among prahok makers. Moreover, it was used to analyse how gender roles, identity, stereotypes, or culture (if any) of making prahok affected these changes. Furthermore, this method was applied to deeply understand and analyse feelings, experiences, and personal stories about prahok production and consumption among various groups of prahok makers to compare and contrast. On the other hand, informed consent was used for in-depth interviews in this study to the protect rights of the respondents. All the in-depth interview respondents were volunteers to participate in the interviews and understood informed consent (verbal consent) before starting the interviews. The below table is illustrated the background information of in-depth interview respondents (Table 3.3).

Table 3.3 Background Information of In-depth Interview Respondents

Respondent	Sex	Age (years old)	Marital status	Place of living (village)
RP-01	F	43	Married	Preaek Sramaoch
RP-02	M	32	Married	Preaek Sramaoch
RP-03	F	60	Married	Preaek Sramaoch
RP-04	F	60	Widow	Preaek Sramaoch
RP-05	F	29	Married	Preaek Sramaoch
RP-06	M	38	Married	Preaek Sramaoch
RP-07	F	58	Married	Preaek Sramaoch
RP-08	F	50	Widow	Preaek Sramaoch
RP-09	M	33	Married	Preaek Sramaoch
RP-10	M	52	Married	Preaek Sramaoch
RP-11	F	51	Married	Mok Wat
RP-12	M	33	Married	Mok Wat
RP-13	F	37	Married	Mok Wat
RP-14	M	35	Married	Mok Wat
RP-15	F	68	Married	Mok Wat
RP-16	M	44	Married	Mok Wat
RP-17	M	56	Married	Mok Wat
RP-18	F	26	Married	Mok Wat
RP-19	F	48	Widow	Mok Wat
RP-20	F	30	Married	Mok Wat
RP-21	M	34	Married	Chhnok Tru
RP-22	M	28	Married	Chhnok Tru
RP-23	F	38	Married	Chhnok Tru
RP-24	F	64	Married	Chhnok Tru
RP-25	F	61	Widow	Chhnok Tru
RP-26	F	61	Widow	Chhnok Tru
RP-27	F	64	Married	Chhnok Tru
RP-28	F	60	Widow	Chhnok Tru
RP-29	M	36	Married	Chhnok Tru
RP-30	F	67	Widow	Chhnok Tru
RP-31	F	54	Widow	Chhnok Tru

Source: Field survey, 2022

c) Field notes

Field notes were used to better understand the current situation, the lifestyle of prahok processors in Tonle Sap Lake, prahok processing, the surrounding environment of their living and processing in their community, infrastructure from the place of their living to fish resources, and markets. In addition, it was used as a complementary evaluation tool to support the key informant interviews and in-depth interviews. Field notes are applied to

maintain the quality of primary data during in-depth interviewswith each respondent from time to time

3.4.2 Secondary Data

Secondary data was gathered from numerous sources including journal, articles, theses, books, and reports from both national and international documentaries. Desk review was used as a tool to collect secondary data in this study. The techniques of collecting secondary data include searching and selecting from the internet, borrowing from the library, and support from the instructor.

3.5 Data Analysis

To obtain the results of the study, the qualitative data was analysed through the transcript, coding, and thematic analysis. The data from KII, field notes, and in-depth interview was analysed in the following manner. First, KII information served as the basis or background information for participants from different locations, providing a source to compare and contrast the different access to fish resources among those areas. Second, Field notes are also used as a foundation for member verification, discussion, coding, and categorization. Third, the in-depth interview was a main tool in this study that is used to analyse ongoing data as a source for the main research questions, the emergence of themes, and as an eventual source for organizing response patterns throughout categories and individuals. All the qualitative data that was collected from the field through these methods were presented in Table 3.4. On the one hand, a qualitative comparative analysis was also applied to analyse the data from in-depth interviews to see the changes in patterns in prahok production and consumption among various groups of prahok makers, identifying affecting factors, comparison the different changes in patterns in prahok production and consumption among various groups, explore feelings, perceptions, and reasons for changes in their prahok production and consumption patterns.

Table 3.4 Brief Information of Data Collection Techniques

Data collection Techniques	Types of Respondent	Number of Respondents	Information to be collected
In-depth Interviews	Women as prahok makers Men in the household of prahok makers	20F 11M	▪ Individual background information ▪ Changes in prahok production and consumption patterns ▪ Influential factors ▪ Reasons for changes production and consumption ▪ Gender roles and responsibilities in prahok production and consumption ▪ Decisions making in terms of prahok production and consumption ▪ Feelings about the changes
KII	Village head Leader of fish processing team Chief of fisheries network	4 1 1	▪ General information about the village and living of villagers ▪ General information about current living patterns of fishers in the village ▪ General information of fishing and fish processing ▪ Fermented fish paste (Prahok) processing in the villages
Field notes	Type of prahok Access to water condition People's living conditions		▪ The environment surrounding the village ▪ Living and activities of people in the village ▪ Prahok products ▪ Fish processing activities

Source: Field survey, 2022

3.6 Ethical Consideration

Ethical consideration is a high priority in this study. Before conducting this study, an ethical application form was submitted to research ethics review committees at the Asian Institute of Technology (AIT) for review and approval. After review by research ethics review committees, the study was accepted and it was confirmed that the risks and inconvenience of this study to participants are minimised and not unreasonable given the research questions and objectives. The researcher is aware of and understands all pertinent ethical issues. Indeed, all procedures for informed consent are sufficient and appropriate. The research ethics review certificate of this study was attached in appendix IV.

3.7 Limitations of the Study

Due to the limitation of timeframe and budgets, this study focused on only prahok production at household levels (micro and small-size productions). In addition, the result of the study cannot represent all prahok production at household levels in other areas that are not located around Tonle Sap Lake as the different geographical locations may have different contexts with regard to access to water, fish resources, and processing prahok. Due to the limitation of the research methodology, the findings of this study that were related to the amount of producing prahok and consumption by each household could not convey in a specific way.

3.8 Research Design Tools

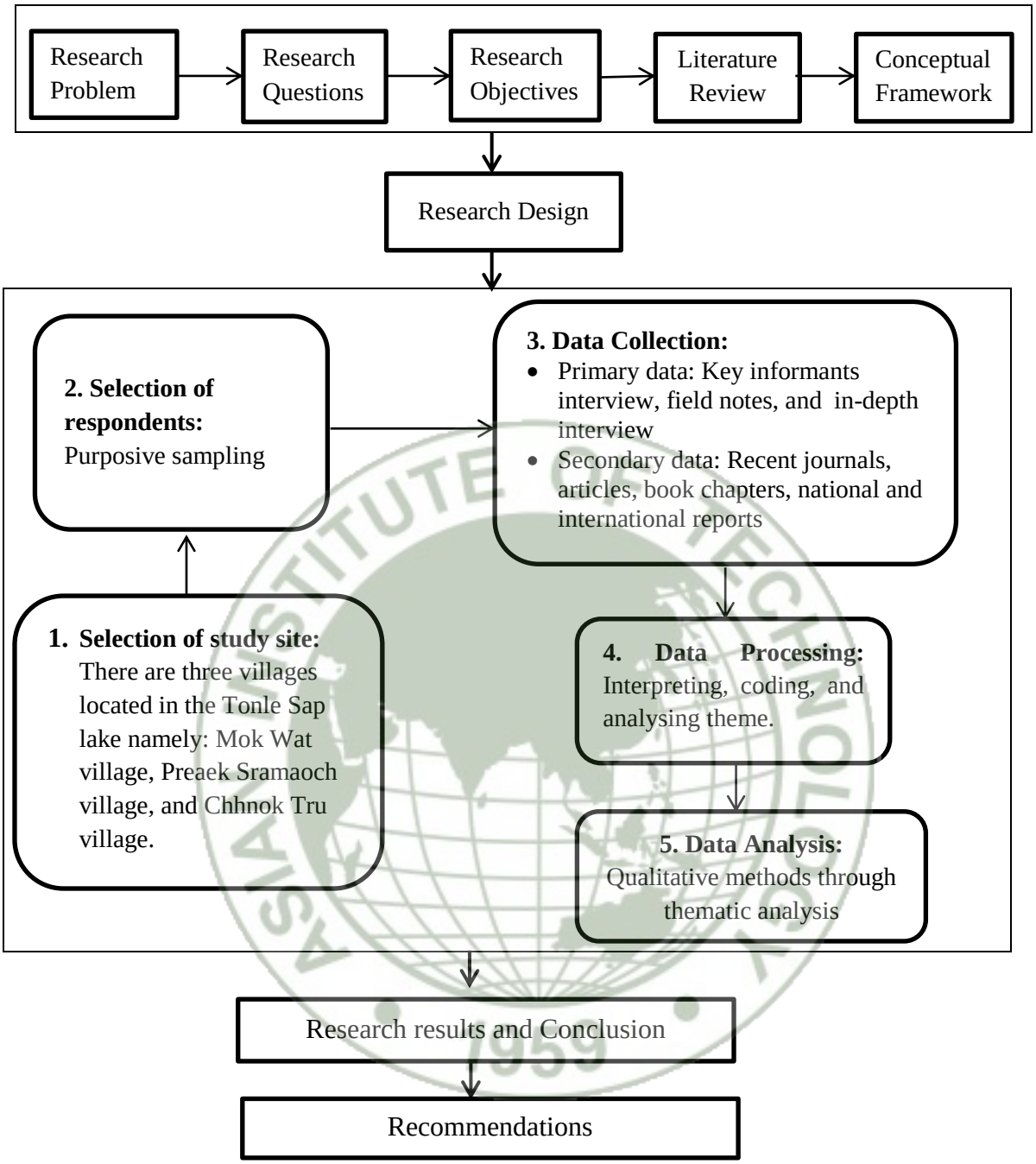

Figure 3.2 Research design diagram

CHAPTER 4
PROFILE OF THE STUDY AREAS AND RESPONDENTS

The study areas' and respondents' profiles are expressed in this chapter. This chapter is divided into three main sections. The profile of the study areas is described in the first section. The profile of the respondents is described in the second section. The third section is the chapter summary.

4.1 Profile of the Study Areas

The profile of the study area reveals brief information related to the geographical and socio-economic conditions of the conducted villages in this study. Among potential fishing areas in Tonle Sap Lake, three villages were selected for this study consists: two villages from Soutr Nikom district, Siem Reap province, and one village from Baribour district, Kampong Chhnang province. Based on the geographical information of three villages that got through key informant interviews, the areas of this study were re-categorised into two categories namely: (1) the areas that are seasonally flooded and have seasonal access to fish but now have less access to fish (Seasonally flooded village / Village 1); (2) the area that formerly had good access to fish but now no more good access to fish (Displaced village/ Village 2). Two villages (Preaek Sramaoch village and Mok Wat village) from Soutr Nikom district, Siem Reap province were in village 1. One village (Chhnok Tru village) from Baribour district, Kampong Chhnang province was in village 2. Detailed information related to the geographical and socio-economic conditions of these two category villages is presented in the below sub-sections.

4.1.1 Geographical and Socio-economic Conditions of Seasonally flooded Village (Village 1)

Soutr Nikom is one of the districts in Siem Reap province. The district is situated in northwestern Cambodia. Soutr Nikom district has 10 communes and 113 villages. Amongst ten communes of the district, Kampong Khleang commune is a large floating area within ten villages on Tonle Sap, the largest freshwater lake in Southeast Asia. Kampong Khleang commune is located 50 kilometers away from Siem Reap city, and approximately 17km from Soutr Nikom district. Among ten villages of Kampong Khleang commune, two villages were selected as the target areas of this study namely: Preaek Sramaoch and Mok Wat villages.

Preaek Sramaoch village (village1) is situated in Kampong Khleang commune, Soutr Nikom district, Siem Reap province. The village normally becomes flooded when the level of water becomes high. However, the flood duration of the village depends on the year and level of Tonle Sap water. Preaek Sramaoch village has of 392 households. There are 1700 people living there, 885 of whom are females. Based on the geographical village, the area does not have good access to water body and fish resources during the dry season which can cause some difficulties for those who rely on fishing and processing activities.

People in Preaek Sramaoch village work in different types of jobs such as farmers, civil servants, traders, hire labor, fishers, and so on. Amongst various types of occupations, approximately 30% of people in the village rely on fishing and fish processing activities, of which around 15 households are fish processors. Regarding fishing and processing activities, men and women play different roles from each other. Normally, most men go to catch fish while women mostly stay at home, taking care of children, selling fish, catching snails, and processing fish such as prahok, paork, mam, and dried fish (Trey Ngeat).

Regarding infrastructure, the village has a good road which can easily access the market, school, hospital center, electricity, and clean water. However, people who are fishers faced difficulty in accessing fish resources in the dry season as the fish resource area is far away (about 10km) from the village. The price of electricity and clean water is affordable. The schools and hospital centers are located on land which provides good accessibility for people in the village. However, awareness of people related to health is limited.

Mok Wat village (village 1) is also located in Kampong Khleang commune, Soutr Nikom district, Siem Reap province. It is a seasonally flooded area (Flooded for six months and on dry land for six months). Mok Wat village has 229 households. There are 1114 people in total in the village, 339 of whom are females. Based on the geographical village, the village has quite good access to the water body and fish resources during the rainy season. However, the area is not in a favorable condition for agricultural activities during the rainy season. Currently, the area also has some problems which caused difficulties for fishers and fish processors in accessing fish resources in the dry season due to climate change and the change level of Tonle Sap water. Almost all people in the village are fishers and rely mainly on fishing and processing activities. Besides, they also do farming activities as secondary jobs during the dry season such as planting crops, vegetables, and raising animals. Similar to Preaek Sramaoch village, men and women have different roles in fishing and processing

activities. Particularly, men as fishers often go fishing while women usually work as housewives (taking children, doing housework), selling fish, and processing fish such as prahok, smoked fish, mam, fish sauce dried fish (Trey Ngeat).

In terms of infrastructure, it is difficult for people in the village to access the market, school, and hospital center during the rainy and dry seasons. In the rainy season, people need to travel by boat or canoe to reach all those places. In the dry season, the road and bridge are quite good, but it may take a long distance to get to the destination. Electricity and clean water for daily consumption remain problems for Mok Wat villagers. With regard to health education, people's awareness of this issue is still limited.

4.1.2 Geographical and Socio-economic Conditions of Displaced village (Village 2)

Baribour district is a district that is situated in Kampong Chhnang province. Baribour district is situated approximately 38 km north-west of Kampong Chhnang municipality by road. The district has a border with Pursat and Kampong Thom provinces. Based on land area, Baribour district is known as a small district in Kampong Chhnang province. Because of the Tonle Sap and the National Highway, the district has an average population for the province. Baribour district comprises 11 communes and 64 villages. Chhnok Tru commune is a potential fishing area of the district and province which is situated at the southern end of the Tonle Sap Lake. There are three villages in Chhnok Tru commune namely: Chhnok Tru, Kampong Preah, and Seh Slab villages. Among these three villages of Chhnok Tru commune, Chhnok Tru village was also selected as the target area of this study.

Chhnok Tru village (Village 2) is located in Chhnok Tru commune, Baribour district, Kampong Chhnang province. Before 2018, Chhok Tru village was a floating village, and had good access to the water body and fish resources. According to the announcement of the Cambodian government in 2018, all residents in Chhnok Tru commune who used to live on the Tonle Sap water were required to displace their living to another area outside the lake due to reorganizing local residence and environment surrounding Tonle Sap Lake. Currently, the displaced area is located far away from the lake around 3km. Due to current geography, the village has no more good access to the water body and fish resources compared to the former location. Chhnok Tru village has 1300 households. There are 5275 people living in the village, 2537 of whom are females.

Before displacement, nearly 90% of people in Chhnok Tru village relied on fishing and processing activities, while the other 10% of the total people are traders, sellers, farmers, civil servants, and so on. After displacement (current time), approximately 70% of the total people keep doing fishing and processing, while some fishers have switched from fishing and processing activities to working as laborers, and factory workers, opening grocery stores and migrating to other provinces in and outside of the country. Amongst migrants, a high number of fishers who migrated to work as hired labor in and outside the country due to changes in place of living (difficulty in access to fish resources) and decreasing in the amount of freshwater fish. Regarding fishing and processing activities, villagers as men often go fishing while women usually work as housewives (taking children & doing housework), selling fish, processing fish such as prahok, mam, smoked fish, mam, fish sauce, dried fish (Trey Ngeat).

Regarding infrastructure, the village has a good infrastructure in terms of access to the market, school, hospital center, electricity, and clean water for daily consumption. However, there is difficulty in accessing fish resources and water sources for fishing and processing fish. The price of clean water is quite high compared to other areas in the district. The price of clean water is 3,000 riel per m^3. People's health education is still limited.

4.2 Profile of Respondents

The profile of respondents section aims to describe the different groups of fermented fish paste (Prahok) makers among the study areas, various types of Prahok, and individual information about current living and working situations among respondents across the target study areas. This section is divided into five sub-sections. The types of respondents are described in first sub-section. The characteristics of the respondents are described in the second sub-section. The third sub-section illustrates information related to type of fermented fish paste (Prahok). The fourth sub-section describes general information about prahok production among the respondents. The general information about prahok consumption is described in fifth sub-section.

4.2.1 Types of the Respondents

According to the responses from respondents during in-depth interviews, the respondents in this study are re-catogorized into four groups based on their experiences and purposes of processing Prahok including: Home consumption prahok makers (Group 1); Professional

prahok makers (Group 2); Fresh fish/Semi-processed prahok sellers (Group 3); Quitting prahok makers (Group 4). Based on this re-categorized of the respondents among the areas of the study, the study also noticed that there were 4 types of respondents for each target area. However, the number of respondents from each target area per group was not equal. It was noticed that many respondents from displaced area were in group 3 and group 4. The characteristics of four groups of the respondents are presented below:

a. Home consumption prahok makers (Group 1)

Home consumption prahok makers (group 1) refer to a common practice of individual makers who prefer and used to make prahok depending on seasonal fish catch or remaining fish from selling or spoiled fish for home consumption purpose. Currently, they still continue to make prahok with the same purpose. The production size is small which only makes for daily consumption and sharing with relatives without selling. Normally, they produce Prahok at their home during the time that they have available fish and time. Their production is only involved by their family members and does not hire any labors.

The process of making prahok for this group is mainly engaged by females as a wife and daughters. Males as husbands and sons often engage in fishing and other outside activities. Prahok makers of group 1 usually produce good quality boneless Prahok for their home consumption. Producing prahok is just a secondary job for them. Besides, they are also involved in other activities to earn income such as selling fish, grocery sellers, farming, raising chicken or fish, and planting vegetables. Based on table 4.1, the total respondent of home consumption group (group 1) was 6 people which 3 respondents were females. There were 5 respondents from the seasonally flooded village (V1), and 1 respondent from the displaced village (V2). All the respondents in group 1 were married.

Table 4.1 Respondents Profiles of Group 1

Respondent	Sex	Age (years old)	Marital status	Palce of living (village)
RP-01	F	43	Married	Preaek Sramaoch (V1)
RP-11	F	51	Married	Mok Wat (V1)
RP-12	M	33	Married	Mok Wat (V1)
RP-02	M	32	Married	Preaek Sramaoch (V1)
RP-21	M	34	Married	Chhnok Tru (V2)
RP-13	F	37	Married	Mok Wat (V1)

Source: Field survey, 2022

b. Professional prahok makers (Group 2)

Professional prahok makers (group 2) refer to individual processors who ever produce prahok depending on their own fish catch or buying freshwater fish/fish meat or buying semi-prahok for both home consumption and selling purpose (large amounts of Prahok is for selling). Recently, they still continue producing prahok with the same purposes. The prahok production size is a small-scale prahok processing at household level. During the peak season, they usually start making prahok and saving from day to day, and from time to time. Normally, they can make prahok from 10kg to 25kg per day. They commonly make either boneless prahok or fermented fish paste with bones.

The process of making prahok for this group involves either family members or hiring a few labors. They often hired from 1 to 3 female laborers to help cut fish heads. The leftovers of fish heads and the smallest fish are used for fish feed or selling to other fish farmers. In the family, a woman as a wife often engages and spends more time processing prahok while a man as a husband often goes fishing and just engages in prahok production for around 1-2 hours (for assisting in cleaning fish and lifting heavy things). Most processors spend their all-time (throughout the year) processing prahok and do not have alternative careers besides engaging in making prahok. Some of them have additional activities such as raising fish, raising chickens/ducks, planting vegetables, and owning grocery stores at home for additional income.

Producing prahok is a primary occupation of women in households. However, the income they get from prahok production can be their primary source or secondary source of family income depending on each household. Regarding selling, they usually sell prahok to their villagers, people outside the village, Vietnamese middlemen, and Cambodian middlemen in and outside their province such as Siem Reap, Kampong Chhnang, Phnom Penh, Prey Veng, Svay Rieng, Kampong Speu, and Kampong Cham provinces. Based on the results of this study, the total respondent of prahok makers in group 2 was 12 people which 8 respondents were females. There were 9 respondents from the seasonally flooded village (V1), and 3 respondents from the displaced village (V2). Most of them were married while only 2 respondents from V1 were widowed women. The detailed information of the respondents in group 2 was shown in table 4.2.

Table 4.2 Respondents Profiles of Group 2

Respondent	Sex	Age (years old)	Marital status	Palce of living (village)
RP-03	F	60	Married	Preaek Sramaoch (V1)
RP-14	M	35	Married	Mok Wat (V1)
RP-04	F	60	Widow	Preaek Sramaoch (V1)
RP-15	F	68	Married	Mok Wat (V1)
RP-05	F	29	Married	Preaek Sramaoch (V1)
RP-06	M	38	Married	Preaek Sramaoch (V1)
RP-16	M	44	Married	Mok Wat (V1)
RP-22	M	28	Married	Chhnok Tru (V2)
RP-23	F	38	Married	Chhnok Tru (V2)
RP-24	F	64	Married	Chhnok Tru (V2)
RP-07	F	58	Married	Preaek Sramaoch (V1)
RP-08	F	50	Widow	Preaek Sramaoch (V1)

Source: Field survey, 2022

c. Fresh fish/Semi-processed prahok sellers (Group 3)

Fresh fish/Semi-processed prahok sellers (group 3) refer to individual processors who used to produce prahok for both home consumption and selling purpose (large amounts of prahok are for selling) depending on own fish catch or buying freshwater fish/fish meat. Due to internal and external factors, the current purposes of making prahok among processors in group 3 has been changed from producing prahok for both consumption and selling to only for home consumption. The former characteristics of producing prahok for processors in this group are similar to characteristics of prahok makers in group 2. Formerly, their prahok production size was small-scale prahok processing at household level. They often made prahok either boneless prahok or fermented fish paste with bones.

In the past, the process of making prahok among processors in group 3 involved either family members or hiring a few labors. They often hired from 1 to 3 female labors to help cut fish heads. The production was often engaged by females as family members and/or female labors. Previously, producing prahok was a primary occupation of women in the households. The income generated from selling prahok could be their primary source or secondary source of family income depending on each household. Currently, Prahok makers of group 3 have

changed their purposes of making prahok. Now, they just make prahok for only home consumption purposes. They currently switch from selling prahok to doing other jobs such as: selling fish, selling semi-prahok, working as hire labor in and outside their living area, and owning grocery shops.

According to the results of this study, the total respondent of prahok makers in group 3 was 7 people which 5 respondents were females. There were 3 respondents from seasonally flooded village (V1), and 4 respondents from displaced village (V2). Among seven respondents, there were 3 widowed women and all of them were from displaced village (V2). The detail information of the respondents in group 3 is shown in table 4.3.

Table 4.3 Respondents Profiles of Group 3

Respondent	Sex	Age (years old)	Marital status	Palce of living (village)
RP-25	F	61	Widow	Chhnok Tru (V2)
RP-17	M	56	Married	Mok Wat (V1)
RP-26	F	61	Widow	Chhnok Tru (V2)
RP-27	F	64	Married	Chhnok Tru (V2)
RP-18	F	26	Married	Mok Wat (V1)
RP-09	M	33	Married	Preaek Sramaoch (V1)
RP-28	F	60	Widow	Chhnok Tru (V2)

Source: Field survey, 2022

d. Quitting prahok makers (Group 4)

Quitting prahok makers (group 4) refer to individual processors who used to produce prahok for either home consumption or selling purposes depending on own fish catch or buying freshwater fish/fish meat. Currently, they stop making prahok due to some factors that affected their livelihood and career as prahok processors. The former characteristics of producing prahok for processors in this group are similar to characteristics of prahok makers in either group 1 or group 2. Formerly, some of them made a small amount prahok for home consumption while others produced a small-scale prahok with a large amount of prahok for selling. They often made prahok either boneless prahok or fermented fish paste with bones.

Previously, prahok productions of some processors in group 4 are often engaged by female members in the households while prahok productions of some processors in group 4 are

engaged by both female members and hiring labors. The income generated from selling prahok could be their main source or additional source of their family income. They currently stop making prahok. After quitting prahok production, some of them sell freshwater fish or fish meat. Others work as hired labor (cutting fish heads) and catch shells or snails. Besides, they plant vegetables and sell vegetables.

Based on the result of this study, the total respondent of prahok makers in group 4 was 6 people which 4 respondents were females. There were 3 respondents from seasonally flooded village (V1), and 3 respondents from displaced village (V2). Amongst six respondents, there were 3 widowed women whereas two of them were from displaced village (V2). The detail information of the respondents in group 4 was shown in table 4.4.

Table 4.4 Respondents Profiles of Group 4

Respondent	Sex	Age (years old)	Marital status	Palce of living (village)
RP-19	F	48	Widow	Mok Wat (V1)
RP-20	F	30	Married	Mok Wat (V1)
RP-29	M	36	Married	Chhnok Tru (V2)
RP-30	F	67	Widow	Chhnok Tru (V2)
RP-31	F	54	Widow	Chhnok Tru (V2)
RP-10	M	52	Married	Preaek Sramaoch (V1)

Source: Field survey, 2022

4.2.2 Characteristics of the Respondents

a. Gender of Different Types of Respondents and Villages

There were different genders of the respondents were conducted among the study areas. According to the result shown in table 4.5, the total number of respondents in this study is 31 people, 20 of those were female respondents. Overall, there were 20 respondents were from a seasonally flooded village (village 1) while there were 11 respondents came from a displaced village (village 2). Due to Cambodian traditional culture, fermented fish paste (Prahok) productions in the study areas are dominated by women. The study by De Silva (2011) confirmed that Cambodian women are often dominated in fish processing, especially at household levels (micro and small-scale productions). Therefore, the number of female respondents in this study was more than the number of male respondents. Indeed, male

respondents in this study were selected from those households whose wives are prahok makers.

As the respondents in this study were re-classified into different groups based on their purposes of making prahok, there were also different numbers of respondents (both male and female) in each group. There were 6 respondents in home consumption prahok makers (Group 1). Professional prahok makers (Group 2) consist of 12 respondents. There were 7 respondents in fresh fish/semi-processed prahok sellers (Group 3) and only 6 respondents were in quitting prahok makers (Group 4). Table 4.5 showed the information related to number of female and male respondents for each group across areas of the study.

Table 4.5 Number of Respondents by Gender and Villages

Types of respondents	Categories of villages				Total
	Seasonally flooded village (V1)		Displaced village (V2)		
	Male	Female	Male	Female	
Home consumption prahok makers (Group 1)	2	3	1	0	6
Professional prahok makers (Group 2)	3	6	1	2	12
Fresh fish/Semi-processed prahok sellers (Group3)	2	1	0	4	7
Quitting prahok makers (Group 4)	1	2	1	2	6
Sub-total	8	12	3	8	31
Total	20		11		31

Source: Field survey, 2022

a. Age

Regarding the age of the respondents, men and women who were interviewed in this study were from different age groups. Respondents' ages are divided into three categories: From 18-35 years old; from 35-60 years old; and over 60 years old. Amongst male and female respondents of the study, the result from table 4.6 reveals that male respondents were 38.27 years of age on average, while female respondents were 51.45 years old on average. In addition, it was shown that male and female prahok makers across different types of prahok makers came from the range of ages from 35-60 years old (middle-aged people), which was 17 people of the total respondents. Based on in-depth interviews, many middle-aged respondents often engage in prahok productions as professional careers (professional prahok

makers). It indicates that people in the middle-aged tend to operate prahok production as their primary occupation and main source of their family income.

Interestingly, there were 8 of the respondents (both males and females) amongst four different types of prahok makers came from the young-age group (18-35 years old). Based on this result, it indicates that prahok production is also importantance for them and their family. Even though some of them had other occupations, they still made prahok as their second job to earn additional income when they were free of work or plenty of fish during the peak season. Others want to protect their ancestor's careers. In addition, it was noticed that the number of respondents who were in group 1 was larger compared to other groups of prahok makers. This is because some young prahok makers still spent their free time making prahok for their daily consumption as they thought that homemade prahok was safe and hygienic for their families.

Remarkably, there were 6 respondents whose ages were over 60 years old from various groups of prahok makers (exception group 1) who also engaged in producing prahok. This is because they could not just stay at home and relied on their children. Some of them lived separately from their children, while some of them were widows. Therefore, they considered prahok production as the main source of their income and livelihood.

Table 4.6 Number of Respondents with Difference range of Ages by Gender and Groups

Age (Year)	Gender	Group 1	Group 2	Group 3	Group 4	Total
18-35	Male	3	1	1	0	5
	Female	0	1	1	1	3
	Total	*3*	*2*	*2*	*1*	*8*
35-60	Male	0	3	1	2	6
	Female	3	5	1	2	11
	Total	*3*	*8*	*2*	*4*	*17*
Over 60	Male	0	0	0	0	0
	Female	0	2	3	1	6
	Total	*0*	*2*	*3*	*1*	*6*
Average	Male= 38.27 years					
	Female= 51.45 years					

Source: Field survey, 2022

**Notice: Group 1: Home consumption prahok makers*
Group 2: Professional prahok makers
Group 3: Fresh fish/Semi-processed prahok sellers
Group 4: Quitting prahok makers

b. Marriage Status

Based on the result in table 4.7, the study figured out that large numbers of respondents in every group (group 1 to group 4) were married. Among 31 respondents, there were twenty-three respondents were married, while eight respondents were widowed/widowers. It shows that marriage is considered a significant factor in their household's economy and health. This also indicates that there were more married men and women than widowed/widowers among fermented fish paste (Prahok) processors. This finding is based on Jim P. Stimpson et al (2012) married people may be better able to withstand difficult economic times than single people because of shared financial resources. Marriage can contribute benefits to spouses in fermented fish paste (Prahok) production.

Most male and female respondents from every group came from fisher households. In the fisher households, men as husbands often go fishing while women as wives stay home doing household chores and bring the fish caught from their husbands for selling and processing fermented fish paste. The study also found that couples are supported by their wives or their husbands in various ways. For instance, men as husbands besides going fishing also supported women in fish cleaning, lifting heavy things during fish processing steps, transporting, and working additional jobs to earn more income. Similarly, women as wives often spend their free time making prahok for either selling or home consumption to earn more extra income or reduce family food expenses.

On the other hand, the study also noticed that widower/divorce women tended to have household economic matters in various ways after the separation or absence of their spouses. According to responses of some respondents in the seasonally flooded village, widowed women prahok makers faced difficulties in processing prahok after their husbands passed away. As some of them never went fishing and did not know how to ride a boat or canoe, they currently switch from processing prahok to buying fresh fish for selling or selling fish meat. Others continue processing prahok but produce less amount than before.

Another case from some divorced women in the displaced village also revealed that their current household’s income and amount of producing prahok decreased compared to the period living with their husbands. They divorced after changing their place of living. The results of changing living patterns and becoming widowers caused women prahok in the displaced village to face double difficulties in terms of HH’s income and prahok production.

To adapt to these issues, some women prahok switched from producing and selling prahok to working as hired labor (cutting fish heads) or owning small grocery shops while others continued producing prahok, but less amount than before, or just made prahok for only consumption.

Table 4.7 Number of Male and Female Respondents based on Marital Status

Marital Status	Gender	Group 1	Group 2	Group 3	Group 4	Total
Married	Male	3	4	2	2	11
	Female	3	6	2	1	12
	Total	6	10	4	3	23
Widowed/Widower	Male	0	0	0	0	0
	Female	0	2	3	3	8
	Total	0	2	3	3	8

Source: Field survey, 2022

**Notice: Group 1: Home consumption prahok makers*
Group 2: Professional prahok makers
Group 3: Fresh fish/Semi-processed prahok sellers
Group 4: Quitting prahok makers

c. Education

With regard to education, there were different education levels among the respondents in this study which is illustrated in table 4.8. The study's findings showed that no male respondents were found to be illiterate, while 10% of all female respondents in the production of fermented fish paste were illiterate. These respondents were found in group 2 (professional prahok makers). The study also showed that 75% of women and 90.9% of men who responded had completed their primary education. Among four groups of prahok makers, many respondents from group 2 had primary education. Regarding secondary education, there were 15% of female respondents, and only 9.1% of male respondents attended secondary education. Among four groups of prahok makers, it was noticed that the high numbers of respondents who had secondary education were in group 4 (Quitting prahok makers). It reflects that they might give up careers as prahok makers and find other better jobs based on their ability and knowledge.

Overall, it indicates that most male and female respondents who engaged in prahok production had a preliminary education, while only a few male and female respondents had

their education at the secondary level. It also indicates that male and female respondents in this study tended to drop out of their education when they became teenagers due to poor income. At the same time, they might start engaging in fishing or assisting their parents in producing prahok to support their family livelihood. In addition, there were no secondary schools in some rural areas or long distances from secondary school to resident settings. These factors also caused male and female respondents to give up their education.

Table 4.8 Different Education levels of Respondents

Education level	Gender	Group 1		Group 2		Group 3		Group 4		Total	
		f	%	f	%	f	%	f	%	f	%
Illiterate	Male	0	0	0	0	0	0	0	0	0	0
	Female	0	0	2	25	0	0	0	0	2	10
Primary school	Male	3	100	4	100	2	100	1	50	10	90.9
	Female	3	100	6	75	4	80	2	50	15	75
Secondary school	Male	0	0	0	0	0		1	50	1	9.1
	Female	0	0	0	0	1	20	2	50	3	15
Total	Male	3	100	4	100	2	100	2	100	11	100
	Female	3	100	8	100	5	100	4	100	20	100

Source: Field survey, 2022

**Notice: Group 1: Home consumption prahok makers*
Group 2: Professional prahok makers
Group 3: Fresh fish/Semi-processed prahok sellers
Group 4: Quitting prahok makers

d. Household size

The average size of households amongst the respondents across four groups of prahok makers is different from one group to another group which is shown in table 4.9. The result illustrated that the average size of HH of the respondents in group 1 and group 2 was quite bigger than the other two groups (group 3 and group 4). There were five people per household for those respondents who were in group 1 and group 2, while there was the same weight of average size of HH (4 people per household) for the respondents who were from group 3 and 4. Overall, it reflects that health education related to reproductive health has been widely spread to the respondents and other people in their areas throughout local health centers and other relevant organizations. As all of them lived in remote areas and had poor incomes, the number of people in the family might have been considered to be limited.

Table 4.9 Average HH's size of Respondents

Types of respondents	Numbers of HH	Average size of HH
Group 1	6	5.2
Group 2	12	5.1
Group 3	7	4.3
Group 4	6	4.5
Total	31	-

Source: Field survey, 2022

**Notice: Group 1: Home consumption prahok makers*
Group 2: Professional prahok makers
Group 3: Fresh fish/Semi-processed prahok sellers
Group 4: Quitting prahok makers

e. Experience in producing prahok

Through in-depth interviews with the respondents across four groups of prahok makers, each fermented fish paste (Prahok) maker had various levels of experience in engaging in prahok production. The various levels of experiences of prahok makers depend on their ages and their main source of income. The experience level of respondents was re-classified into three levels including: under 10 years, from 10 to 40 years, and over 40 years. Table 4.10 showed the information related to the experience level of respondents in this study regarding their experiences in producing Prahok.

The result of the study illustrated that many respondents from each group had experience in producing prahok from 10 to 40 years (total around 38.7 % of the total respondents). It indicates that those who have numerous experiences in producing prahok came from the group of middle-ages (which is mentioned in point b). It also indicates that their main source of income or primary job is from engaging producing prahok. Remarkably, the result of the study also revealed that there were about 35.48% of the total respondents had experience in producing prahok for over 40 years while only 25.8% of the total respondents had experience in producing prahok for less than 10 years. It reflects that the respondents who had experience in prahok production for less than 10 years were young people. The respondents who had experienced more than 40 years of experience were older people. Even though they have less or more experience, they still engage in producing prahok for various purposes.

Table 4.10 Experience level of Respondents' HH in Engaging in Prahok Production

Types of respondents	Experience levels						Total	
	Under 10 years		From 10-40 years		Over 40 years			
	f	%	f	%	f	%	f	%
Group 1	4	12.9	2	6.5	0	0	6	19.4
Group 2	2	6.5	4	12.9	6	19.4	12	38.7
Group 3	2	6.5	2	6.5	3	9.7	7	22.6
Group 4	0	0.0	4	12.9	2	6.5	6	19.4
Total	8	25.8	12	38.7	11	35.48	31	100

Source: Field survey, 2022

**Notice: Group 1: Home consumption prahok makers*
Group 2: Professional prahok makers
Group 3: Fresh fish/Semi-processed prahok sellers
Group 4: Quitting prahok makers

4.2.3 Types of Fermented fish paste (Prahok)

Tonle Sap Lake, a large source of freshwater fish in Cambodia, provides numerous advantages to Cambodian people who have lived surrounding the lake including fishing, selling, and processing activities. In terms of fish processing, freshwater fish was produced into various types of products such as dried fish, fermented fish paste (Prahok), fish sauce, smoked fish, and Pa Ork. Small-size fermented fish paste (Prahok) is one of the most popular products that is commonly practiced and processed throughout generations amongst Cambodians, especially fisher households. Prahok has been used as an additional ingredient to many Khmer foods in Cambodian cuisines, such as soups. Fermented fish paste (Prahok) can be made from all sizes of fish (big or small), fresh or spoiled fish, and many types of fish which has less oil. The processing techniques of prahok vary based on the location and scale of the production. Based on the majority responses of respondents, there are three main kinds of prahok namely: boneless fermented fish paste (Prahok Sach), fermented fish paste with bones (Prahok Choeng), and semi-processed prahok (in the middle of the final product).

a. Boneless fermented fish paste (Prahok Sach)

Boneless fermented fish paste (Prahok Sach) is a kind of fermented fish paste that is made from boneless fish (fish meat) mixed with salt. The process of making boneless fermented fish paste requires quality fish and hygiene during the processing steps. The process of making Prahok Sach is quite time-consuming. The processors need to spend more time

cutting fish heads, removing the bones of the fish (or even the skin of fish), cleaning until less oil, draining, drying, salting with salt for two or three times, and fermenting for three months or more than three months.

According to the majority responses of respondents among target study areas, Prahok Sach is mostly kept for home consumption as it has no fish bones and is easy to put or make foods. Prahok Sach is a popular type of prahok that is commonly produced and sold in Siem Reap province. Normally, people in the area often make Prahok Sach from gourami moonlight fish (Trey Kompleanh species). The price of selling Prahok Sach per kilogram is more expensive than other types of prahok. The farm gate price of Prahok Sach is range from 18,000 riel/kg to 20,000 riel/kg, while the price of Prahok Sach in the market is range from 25,000 riel/kg to 30,000 riel/kg. The detailed price of selling prahok was shown in appendix V.

b. Fermented fish paste with bones (Prahok Choeng)

Fermented fish paste with bones (Prahok Choeng) is a kind of fermented fish paste that is made from fish (without taking fish bones) mixed with salt. The process of producing fermented fish paste with bones is quite similar to making boneless fermented fish paste. The processors need to spend time cutting fish heads, removing scales, cleaning until less oil, draining, drying, salting with salt for two or three times, and fermenting for three months or more than three months.

Based on the majority responses of respondents among the target study areas, Prahok Choeng is mostly produced for selling rather than for home consumption depending on the food preference of each household. Normally, people in the area usually make Prahok Choeng from Trei Riels. The price of selling Prahok Choeng per kilogram is cheaper than Prahok Sach. The farm gate price of Prahok Choeng is range from 7,000 riel/kg to 10,000 riel/kg, while price of Prahok Choeng in the market is range from 14,000 riel/kg to 15,000 riel/kg. The detailed price of selling prahok is shown in appendix V. Amongst study areas, Prahok Choeng is mostly produced in Kampong Chhnang province and sold to people/middlemen in the province, outsider middlemen from different provinces such as Prey Veng, Svay Rieng, Kampong Cham, and Kampong Speu provinces.

c. Semi-processed Prahok

Semi-processed Prahok is a middle process of either boneless fermented fish paste or fermented fish paste with bones. The form of processing semi-processed prahok can be made in which fish are beheaded and washed or removed the bones, then quickly sold to middlemen/wholesalers without applying salt. Another form of processing semi-processed prahok can also be made in which fish after beheading and washing are applied one time salt with or without keeping one or two days before selling to middlemen/wholesalers. Among the study areas, semi-processed prahok Choeng has been produced and sold by many respondents in Kampong Chhang province, while several respondents in Siem Reap province produced and sold semi-processed prahok Sach. The price of selling semi-processed prahok is cheap. At the farm gate, the price of semi-processed prahok Choeng is range from 3,000 riel/kg to 5,000 riel/kg whereas the price of semi-processed prahok Sach is around 10,000 riel/kg. The detailed price of selling prahok was shown in appendix V. Due to market trends (requirements of middlemen), semi-processed prahok is quite popular demanding from in and outside middlemen/wholesalers including Vietnamese middlemen, and middlemen/wholesalers in the province and other provinces (Kratie, Kampong Cham, Phnom Penh, Takeo,...etc) in the country.

4.2.4 General Information about Prahok Production among the Respondents

a. Common period of processing prahok

According to in-depth interviews with respondents, the study revealed that the respondents in every group had the same common practice of producing prahok. They commonly make prahok and save from time to time. However, they mostly start making prahok at the end of the rainy season (peak season) from October to March or November to March/April depending on the water level of each year. They start making prahok at that time because there is plenty of fish during peak season. In addition, it is also the cheap price of freshwater fish if they want to buy fish for making prahok.

b. Women's and men's roles or responsibilities in prahok production

In terms of prahok production, the study found that it is normally dominated by women. It is confirmed by the study of De Silva (2011). It was shown that Cambodian women are also the same in other countries in Southeast Asia where women are often dominated in fish processing, especially at the level of micro and small-scale household fish processing (De Silva, 2011). In the fisher households, men often go fishing and do other jobs outside the

house to earn income while women often stay home, do housework, sell fish, and process fish.

Based on the majority responses of the respondents from all groups, the study found that women were often involved in making prahok in the season of making prahok or when there was plenty of fish or free of work while men were often involved in fishing activities and rarely engaged in processing prahok. The activities of women in prahok production included cutting fish heads, removing scales, cleaning, and processing into prahok. Normally, men's tasks in prahok production included cleaning fish, lifting heavy things, and transporting them. They only did these tasks when they were free of fishing. Indeed, most men do not know how to make prahok. It is also noticed that the time in involving in prahok production of women is more than men. Therefore, it indicates that there was a gender division of labor between females and males in prahok productions in the areas of this study.

As many steps and activities in prahok production were engaged by women, the study further explored women's perceptions of being a prahok maker in the household. The majority responses from female respondents expressed that they never resent being prahok makers. Women thought that processing prahok is their task, and men also have the role to go fishing. Moreover, women respondents also thought that men still play an important role in prahok production even though they do not often engage in prahok production. This is because their prahok production mainly relied on fish caught. The majority responses of male respondents also expressed producing prahok is a task of women. They are men, and they have responsibilities in going fishing and doing other activities to earn income to support their family. Moreover, male respondents also responded that they do not know how to make prahok. Processing prahok is a professional skill for women. Even though they know how to make prahok, the taste of prahok might not have been delicious like women do. Therefore, it indicates that gender stereotypes have emerged in prahok production among groups of prahok makers across the study areas.

> *"For me, I never feel resent of being prahok maker in the family. It is my task. My husband already went fishing. He is tired too. In my family, I am the one who is a prahok maker and do housework. As I am a housewife, I cannot go far away from to do any jobs. I just stay home, looking after my children, do household chores, and making prahok."* (Female respondent, 43, home consumption group, seasonally flooded village, in-depth interviews, 2022)

One male respondent also pointed out that *".....my wife used to hire 3 or 4 female labors to help her cutting fish heads and draining. After that, my wife continues to process into prahok by herself. She only hired labors for 30days per season. I don't know how to make prahok, I just help her lifting heavy things. I think that it is my wife task."* (Male respondent, 28, professional group, displaced village, in-depth interviews, 2022)

c. Decisions making in prahok production

In terms of decisions making in prahok production, the study found that women as prahok makers in the study areas could make decisions for prahok by themselves without joining decisions with men as a husband or household heads. Based on males' and females' responses, it is shown that women in their families were able to decide which amount needed to produce, to keep for home consumption or selling, and continue or not continue making prahok. Male respondents responded that they were busy fishing, and did not know how to make prahok. Indeed, men thought that prahok production is a women's task. Thus, women can decide on this matter. It indicates that women could make decisions for prahok production because it is her task.

One male respondent said that *"For prahok production, my wife can decide on it. I think that she is a housewife and she is also the one who make prahok. So that she can decide on prahok production. On the other hand, I am busy with fishing. I don't know much about this matter."* (Male respondent, 32, fresh fish/semi-processing group, seasonally flooded village, in-depth interviews, 2022).

"I never buy fish to make prahok. I just make prahok depending on amount of fish caught. In my family, I am a person who decides on prahok production because I am a prahok maker. My husband does not say anything about this whether I continue or not continue making prahok." (Female respondent, 64, professional group, displaced village, in-depth interviews, 2022)

4.2.5 General Information about Prahok Consumption among the Respondents

a. Daily food types

There are many types of Khmer traditional foods that every Cambodian household used to cook for everyday diet such as Samlomachour, Brahaer, Tukkrueng, Kokaur, Prahok Steam, Samlomachour Kreang, and so on. Based on the responses from in-depth interviews among the respondents in the study areas, the popular types of foods that were containing prahok, and they used to cook such as Tukkrueng, Kokaur, Prahok Steam, Samlomachour, and so on depending on each household's food preference. Besides, they also cooked foods that were not containing prahok such as fried meat or fish, mixed fried with vegetables and meat, and vegetable soups. The study also found that there was no change in their daily food types. However, the foods that contained prahok might be not irregular cooking depending on the food preference of their family members. Furthermore, every household has different favorite food and level of putting prahok into the soups. Normally, they put prahok into soups by using spoons depending on the kinds of foods, size of soup, and family member favorite. For instance, Tukkrueng, Kokaur, and Prahok Steam might like to put more amount of prahok into these kinds of foods than other soups.

b. Women's and men's roles in food preparation and decisions making in prahok consumption

In terms of gender roles in food preparation in the family, the study found that women, in the family, often had responsibilities in cooking food and going to the market while men rarely engaged in these tasks. Based on Khmer traditional culture, men often think that cooking food is a task of women. It is the same as what Cairns et al (2010) found. The study was shown that women and men are affected by gender norms in different ways in terms of food preparation. In many nations' cultures, home food preparation is considered women's task rather than men's task (Cairns et al., 2010).

Regarding decisions making in food preparation and using prahok in the family, the study found that women were able to make decisions on these matters by themselves. Both male and female respondents responded that women, in their family, could make decisions on foods preparation and consuming prahok in the family because it is women's roles (Cambodian traditional culture). It indicates that women could make decisions for prahok consumption because it is her task. Moreover, there has been no change in gender roles between men and women in the households from the past until now according to the responses of male and female respondents in the study areas. Therefore, the issues of gender

roles in terms of food preparation in the houshold among various groups of prahok makers have also emerged.

> *"In my family, I am a food maker because it is women's task. My husband rarely helps me in this task. Normally, I decide what kinds of food need to cook and in which amount*." (Female respondent, 38, professional group, displaced village, in-depth interviews, 2022)

> A male respondent said that *"In my family, my wife is a person who cooks foods for other members in the family. I sometimes help her cooking foods. Normally, my wife is a person who makes decisions on this matter."* (Male respondent, 36, quit group, displaced village, in-depth interviews, 2022)

4.3 Chapter Summary

This study was conducted in the three different areas among the potential fishing areas in Tonle Sap Lake. The three target areas of this study included Preaek Sramaoch village, Mok Wat village, and Chhnok Tru village. Preaek Sramaoch and Mok Wat villages are located in Soutr Nikom district, Siem Reap province. Chhnok Tru village is located in Baribour district, Kampong Chhnang province. Based on the characteristics of actual study areas, the areas of this study was re-classified into two categories: (i) Seasonally flooded village (Mok Wat and Preaek Sramaoch villages); (ii) Displaced village (Chhnok Tru village). Among the study areas, the respondents in this study were re-classified into four groups prahok makers based on their experiences and purposes of producing prahok including: Home consumption prahok makers (group1); Professional prahok makers (group2); Fresh fish/Semi-processed prahok sellers (group3); and Quitting prahok makers (group4).

Regarding the characteristics of the respondents across four groups in the study areas, male and female respondents in each group came from various ages, different marital statuses, education, and experience levels in engaging in prahok production. Female respondents in this study were prahok makers while male respondents were selected from those whose wives were prahok makers. With regards to the ages of male and female respondents, there were three age groups: 18-35 years old; from 35-60 years old; and over 60 years old. Across four groups of prahok makers, male and female respondents were mostly from the middle-aged group (35-60 years old). Relating to marital status, a large number of respondents in each

group of prahok makers were married while others were widowed women. Most widowed women are often seen in group 3 and group 4, and they were from the displaced village. Relating to education level, male and female respondents in each group mostly had primary education, whereas several of them were illiterate, and had secondary education. It was also found that many respondents from each group had experience in producing prahok for 10 to 40 years whereas others had experience in processing prahok for less than 10 years. Yet, there are also significant numbers of respondents who engaged in prahok productions for more than 40 years. Thus, it indicates that those who have numerous experiences in producing prahok came from the group of middle-aged and old-aged groups.

In terms of prahok production among the respondents in various groups of prahok makers, there were three types of fermented fish paste (Prahok) that they used to produce that is known as boneless fermented fish paste (Prahok Sach); fermented fish paste with bones (Prahok Choeng); and semi-processed prahok. The productions of Prahok Sach and semi-processed Prahok Sach were popularly produced by the respondents in the seasonally flooded village (Siem Reap province), while Prahok Choeng and semi-processed Prahok Choeng were often seen among the respondents in the displaced village (Kampong Chhnang province). Indeed, the prahok productions among the respondents in this study were micro and small-sized productions at household levels. Generally, they started making prahok at the end of the rainy season (peak season) from October to March or November to March/April depending on the level of water each year, and save prahok from time to time.

This study also found that prahok production is often dominated by women. In prahok production, women are often do more tasks than men.Women's tasks in prahok production include cutting fish heads, removing scales, cleaning, and processing into prahok whereas men's tasks include cleaning fish, lifting heavy things, and transporting. Indeed, men only do these tasks when they are free of fishing, and most of them do not know nor has professional skill in producing prahok like women. The majority of responses from female and male respondents also illustrated that prahok production is more likely women's work than men's work since ancient times. Thus, it indicates that there was a gender division of labor and gender stereotypes between women and men in prahok productions among the areas of this study. However, this study found that women could make decisions on prahok production.

In terms of women's and men's roles in food preparation and decisions making in prahok consumption, the study found that women, in the family, often had responsibilities in cooking

foods and going to market while men rarely engaged in these tasks. It indicates that women and men are affected by gender norms in different ways in terms of food preparation. Moreover, this study also found that women could make decisions on food preparation and prahok consumption in households by themselves. This is because the roles in food preparation are considered women's roles in the family. Furthermore, the issues of gender roles in terms of food preparation in the houshold among various groups of prahok makers have also emerged.

CHAPTER 5
CHANGES IN PRAHOK PRODUCTION AND CONSUMPTION PATTERNS

This chapter discusses the changes in patterns in prahok production and consumption among various groups and made a comparison. This chapter also illustrates the factors that affected prahok production among prahok makers which made them into different groups of prahok production. There are six sections in this chapter. The changes in patterns of prahok production and consumption, and influential factors among four groups of prahok production are illustrated in the first, second, third, and fourth sections accordingly. The comparison and identifying factors affecting prahok production and consumption among various groups is presented in the fifth section of this chapter. The sixth section is about the chapter summary.

5.1 Home Consumption Prahok makers (group 1)

This section discusses the changes in prahok production and consumption patterns among people in the home consumption group based on their experiences of producing and consuming prahok and continue to investigate the factors that affected their prahok production.

5.1.1 Production

Home consumption prahok makers (group 1) refer to a common practice of individual makers who used to make prahok depending on their own fish caught that remained from selling or spoiled fish for home consumption purposes. Their prahok production size is very small (under 50kg/yr), and only makes for daily consumption and sharing with relatives without selling. Normally, they produce prahok at home during their spare time. Prahok production of group 1 is only involved by members in the households without hiring any labors. Producing prahok is just a secondary job for them. According to the study's findings, this study found that current prahok production and consumption patterns among people in group 1 changed based on their experiences. Below paragraphs were illustrated these changes.

Through in-depth interviews, people in the home consumption group preferred to make boneless fermented fish paste (Prahok Sach) rather than fermented fish paste with bones (Prahok Choeng). This is because Prahok Sach is easy to consume or make foods. Indeed, the taste of Prahok Sach is also quite delicious than Prahok Choeng. Normally, home

consumption prahok makers often made prahok from their own fish caught that remained from selling or spoiled fish, and saving from time to time. Processing prahok was just their secondary job. Women, in their households, usually produced prahok during their spare time. Based on these results, it indicates that the activity of making prahok among prahok makers in group 1 is a kind of waste fish management activity for women when they are free of household chores and outside work. Additionally, it was noticed that there were no changes regarding the types of prahok for producing and the source of fish for producing prahok among people in the home consumption group. Before and now, they have produced Prahok Sach from their own fish caught when there was plenty of fish, and saving from time to time.

In addition, the study figured out that current prahok production among prahok makers in group 1 slightly decreased (approximately from 50kg/yr to 30kg/yr) based on their experiences of producing prahok. Normally, the average amount of their producing prahok has depended on each household's consumption and their own available fish. However, the amount of producing prahok for each household from the past until the present is under 50 kg/yr. That amount is not only for home consumption but also includes sharing with relatives and friends or even keeping for the next year's consumption (in a case cannot consume all prahok). One female respondent responded:

> *"Before, my family used to make prahok around 20Kg/yr. At the present, my family only makes 15Kg for whole year consumption."* (Female respondent, 37, home consumption group, seasonally flooded village, in-depth interviews, 2022)

As people in the home consumption group only produced prahok for home consumption, there was no income generation from prahok among them. They had their own careers which provided them with income to support their family. However, it was observed that there was a change in women's and men's roles in their families. Some respondents responded that members of their families were busy going to work outside and did not have much time to make prahok. A case from the female respondent who lived in the seasonally flooded village showed that she currently did not have spare time for making prahok as her husband went to work far away from home, and she was also busy with her job and household chores. Currently, she was the only one who was involved in making prahok. Due to this issue, she added that it was hard for her to produce prahok with the same amount as before as she was busy with household work and other income generation.

Yet, processing prahok still played important roles in terms of food security or food preservation for their family though there were changes in patterns of their prahok production. In terms of safe prahok to eat, many respondents mentioned that they always preferred and took time to make prahok for home consumption rather than buying prahok from the market because they felt not delicious and unhygienic like homemade prahok. If they have to buy prahok for home consumption, they might like to buy prahok from their villagers. Moreover, the majority of responses from the respondents among group 1 with different study areas expressed that processing prahok could also reduce their family's expense for buying prahok. Interestingly, a few respondents from the seasonally flooded village (V1) illustrated that making prahok could be a source of getting other food security. It means that they can exchange prahok to get rice or paddy rice from other people in their village for their household's food security.

> *".....at least making prahok can help to reduce my family expense on food from 30%-40%. On the other hand, I can exchange prahok to get paddy rice for consumption in the family. As I used to exchange, 3 kg or 4 kg of prahok can get paddy rice from 100-200Kg. Anyway, I only make prahok from remaining fish of selling and never buy fish from others to make prahok."* (Female respondent, 43, home consumption group, seasonally flooded village, in-depth interviews, 2022)

According to the changes in prahok production patterns, this study found that livelihood strategies was a factor that affected prahok production of people in group 1. As mentioned in the early discussion, this factor caused the home consumption group to produce less amount of prahok than before and changes in women's and men's roles in their families. The study also found that their livelihoods relied on various activities including fishing, selling fresh fish and/or selling fish meat (fish that already removed bones), traders, vegetable sellers, working as hired labors in the factories, and so on. Thus, some of them showed that a large amount of current fish caught was kept for selling rather than keeping for processing prahok, while others responded that they were busy with other jobs and did not have much time to make prahok.

> *"My family livelihood depends on fishing and selling fresh fish. We make prahok for only home consumption. Generally, remaining fish from selling, spoiled fish or small fish will be processed into prahok."* (Female respondent, 51, home consumption group, in-depth interviews, 2022)

5.1.2 Consumption

Based on the results of the study, it was found that the way of consuming prahok among home consumption prahok makers had various ways of consuming prahok in their families. The ways of consuming prahok among people in group 1 were based on habits of their family diet and local cuisine. Commonly, they consumed Prahok Sach. Indeed, they always preferred homemade prahok. In terms of food preference, the study found that there were different perspectives among the respondents in the study areas. Some respondents responded that their families always cooked foods with prahok and put a large amount of prahok into soups while others responded that their families always made foods with prahok but did not put much amount of prahok into it. This is because of personal food interests and favorites among members of their families. The different perceptions of the respondents on this matter were described below.

> *".....rural people like to put prahok in their daily foods. As a rural person, I feel not delicious if the food does not contain prahok. For my family, I have to put less prahok in soups because my husband does not like the heavy smell of prahok."* (Female respondent, 43, home consumption group, seasonally flooded village, in-depth interviews, 2022).

> *"For everyday foods, my family often cooked foods that contain prahok. However, we need to put much amount of prahok into those kinds of foods because we felt not delicious if the foods do not have the heavy smell."* (Female respondent, 51, home consumption group, seasonally flooded village, in-depth interviews, 2022).

On the other hand, the study found that the ways of consuming prahok among prahok makers group 1 were also related to the amount of producing prahok in their families. Several respondents responded that they had to consume or put less amount of prahok into daily foods as they currently produced less amount of prahok. They would consume prahok with the amount of prahok that they had and might not buy prahok from others. The below quotes presented respondents' perspectives related to this matter.

> *"Currently, the amount of consuming prahok in my family decreased 2-3Kg due to decreasing amount of producing prahok. Now, I always put less amount of prahok into soups as we can produce less amount of prahok than before. I will consume*

prahok with that amount and may not buy prahok from others." (Female respondent, 37, home consumption group, seasonally flooded, in-depth interviews, 2022)

Relating to the amount of prahok consumption in the household of respondents in group 1, the result of the study revealed that there was a different average amount of consuming prahok for each household among some respondents in group 1 while others responded they consumed prahok with the same amount as before. In the past time, they normally consumed prahok from 5-15Kg/yr. Currently, the average amount of consumed prahok for each household slightly decreased due to decreasing amount of produced prahok. Recently, they only consumed prahok from 5-10Kg/yr.

"On average, my family consumes prahok 10Kg/yr. This year, I can produce only 5Kg of prahok as lack of fish. I am not sure whether I need to buy prahok more from others or not. It depends on the real situation of consuming prahok in my family for this year." (Female respondent, 51, home consumption group, seasonally flooded village, in-depth interviews, 2022).

5.1.3 Summary

The fermented fish paste (Prahok) production of home consumption prahok makers (group 1) is a kind of prahok production that is being made with a small amount of remaining fish from selling or abandoned fish for home consumption purposes. The activity of processing prahok is just a secondary job or waste fish management activity of women that they usually do during their spare time or when there were plenty of fish. The attached meaning of making prahok among home consumption prahok makers is more related to food roles rather than economic roles. Currently, there were changes in prahok production patterns among people in this group. Particularly, the change in the amount of producing prahok (slightly decreased amount of producing) and the change in women's and men's roles in their families. Livelihood strategies was found as the main factor that caused their prahok production changes. Besides, this study also observed that this factor did not make them change their purpose of making prahok and the type of prahok for producing. All of them have continued making Prahok Sach for home consumption. Moreover, prahok still plays significant roles in terms of food preservation or food security for them even though prahok is being made for only home consumption. Furthermore, homemade prahok is considered a kind of prahok without any chemicals and safe to eat or use as an ingredient for their daily cooking foods.

In terms of prahok consumption in the household, prahok is a significant ingredient among prahok makers in group 1 that cannot lack in their daily foods, especially Khmer traditional foods. Before and now, they often consumed Prahok Sach, and always preferred homemade prahok. In terms of experiences and ways of using and amount of putting in their prahok consumption, it might be differences from one household to another household. Due to the decrease in the amount of produced prahok in their families, there was a change in the amount of prahok consumed in each household. They currently consumed less amount of prahok than before by slightly putting less amount of prahok into foods.

5.2 Professional Prahok makers (group 2)

This section discusses the changes in prahok production and consumption patterns among people in professional prahok makers based on their experiences of producing and consuming prahok, and illustrates the factors that affected their prahok production.

5.2.1 Production

Professional prahok makers (group 2) refer to individual processors who often produce prahok from their own fish caught or buy freshwater fish/fish meat from others and then processing into prahok. The purposes of their producing prahok are for selling and home consumption (a large amount of prahok is for selling). It is more likely a commercial activity rather than processing for home consumption. Their prahok production size is a small-scale prahok processing at the household level (from 50 kg/yr to 1 ton/yr). Mostly, they spend their all-time (throughout the year) processing prahok. Prahok production among the respondents in group 2 can be involved by either member in the households or hiring a few labors at the beginning step of processing (fish preparation). Frequently, producing prahok is a primary job for them or their professional career. According to the study's findings, this study found that current prahok production and consumption patterns among people in group 2 changed based on their experiences. Below paragraphs were illustrated these changes.

Before and now, the professional group has produced both Prahok Sach and Prahok Choeng as usual for selling and home consumption purposes. They usually produced prahok and saved from time to time for selling a whole year. Prohok Sach and Prahok Choeng are also kept separate from each other to preserve the quality of prahok and made it easy for customers to choose. They normally produced both boneless fermented fish paste (Prahok

Sach) and fermented fish paste with bones (Prahok Choeng). Prahok was sold to people in their villages, middlemen/wholesalers from in and outside their local areas or provinces. They liked to sell Prahok Choeng because it was easier to make and spent less time processing than Prahok Sach. Prohok Sach was sold when they could produce over the amount of prahok that they intended to keep for home consumption. Normally, they sold Prahok Choeng and kept Prahok Sach for home consumption. They liked to keep Prahok Sach for home consumption because it was no bone which was easy to make and cook foods. As Prahok Sach is often kept for home consumption, prahok makers group 2 often selected big and good fish (fish is not containing much oil) and carefully processed it to obtain good taste and long time keeping without damage. However, it does not mean that they were not carefully making prahok for selling. They still produced good quality prahok for selling because they are also concerned to lose the trust of their customers if their prahok is not good quality. In terms of the quality and taste of prahok, Prahok Sach and Prahok Choeng have similar tastes.

For quality identification of either Prahok Sach or Prahok Choeng, it is no exactly ways to identify whether it is a good quality prahok or not. Based on the responses from professional prahok makers, the good quality of prahok must being made more carefully and hygienic for every step of processing such as good cleaning fish and removing fish oil, the amount of putting salt (not very salty or less salty), keeping prahok in a better storage place (putting it in a shade place), and preserve for a long period of time. Additionally, good quality of prahok might have slightly dark color (Pore Srakam) and heavy smell. The color and smell of prahok can identify the period of preserving prahok and taste of prahok. However, all of these identifications are based on their experience and observation in producing prahok or what they learnt from their ancestors.

Fish is a main component for producing prahok. There were various sources of fish that they used to process into prahok. Currently, some professional prahok makers made prahok from all their own fish catch, while others produced prahok from their own fish caught and additional fish that they bought from other villagers. Besides, some professional prahok makers produced prahok by only buying fresh fish or fish meat from other people in their villages to process into prahok for selling and consumption.

In addition, this study found that the current amount of their prahok producing moderately decreased based on the experiences of their processing. Up to now, the average amount of producing prahok among respondents from group 2 has depended on the quantity of catching

fish, capital, and producing capability of each household. In the past time, some of them could produce prahok from 50Kg to 200Kg per year while others could produce prahok from 100Kg to around 600Kg per year. At the present, some of them can produce prahok from 40 kg to 150 kg per year, whereas others can produce prahok from 100 kg to around 400 Kg per year. However, the amount of prahok for home consumption did not decrease. They still kept prahok with the same amount as before.

> *"Before, I produced prahok Sach from 400-500Kg for both selling and consumption. Now, I can make prahok from 200-300Kg/yr only."* (Female respondent, 60, professional group, seasonally flooded village, in-depth interviews, 2022)

> *"Before displace, I could produce prahok over 300Kg per year. During that time, it was easy to go fishing and processing fish. Nowadays, I can produce prahok over 200Kg per year."* (Female respondent, 64, professional group, displaced village, in-depth interviews, 2022)

As prahok production is a professional career and the main source of income for professional prahok makers, this study also observed that the change in the amount of producing prahok also caused matters for them and their families' livelihoods in various ways. According to in-depth interviews, the result of the study illustrated that their household's income significantly decreased which affected their livelihood as a big part of their family income came from prahok production. In addition, the study revealed that the income getting from prahok still decreased though the current price of selling prahok was higher than the time that they used to sell. In the past, the price of selling prahok Sach was around 15,000 riel/kg, while the price of selling prahok Choeng ranges from 5,000-7,000 riel/kg. Currently, the price of selling prahok Sach is 20,000 riel/kg, while the price of selling prahok Choeng ranges from 8,000 - 12,000 riel/kg.

> *"On average, I could earn over 2,000,000 riel per year during the past time. Nowadays, I can get income only 1,200,000 riel or under this per year. Current price of selling prahok is 20,000 riel/kg. It is more expensive than before, but I still cannot get better income."*(Female respondent, 60, professional group, seasonally flooded village, in-depth interviews, 2022)

> *"Before, I could earn income about 3,000,000 riel per year. Nowadays, I gain income from prahok only 2,000,000 riel per year. Even though the current price of prahok is more expensive than before, it does not gain much profit. This is because I cannot produce large amount of prahok as before due to increasing price of fresh fish and salt."*(Female respondent, 64, professional group, displaced village, in-depth interviews, 2022)

In terms of gender roles, this study did not find any changes related to women's and men's roles in the household among the professional group. In their family, women and men have performed the same roles and tasks in the family and prahok production. Men went fishing and engaged in prahok production when they were available. Women stayed home, did household chores and took care of children, and collected fish from their husbands to process into prahok for selling and consumption in the family.

On the other hand, the study also found that processing prahok has played important roles for people in group 2 such as a professional career and the main source of their family income. Interestingly, the waste of fish from making prahok such as head of fish and tiny fish were used for different purposes. Through in-depth interviews with them, some professional prahok makers were also raising fish for selling, and the head of fish or tiny fish from processing prahok were kept as feed for their fish. Other who did not raise fish, sold the head of fish and tiny fish to the fish farmers in their areas to get extra income. Besides, it was also found that some professional prahok makers also produced fish sauce from the prahok sauce for selling and home consumption. These kinds of activities were been done by professional prahok makers across the villages of the study areas. Therefore, it indicates that prahok production among professional prahok makers was important and could be seen not only as a career identity but also as a kind of circular economy activity.

Furthermore, there were various perspectives related to the roles of prahok production among the respondents of group 2 from various locations for them and their family. Based on study's findings, some of them responded that prahok production was a main source of their family income, food preservation and safe to eat (homemade prahok). Others expressed that it was a career from their ancestors. Besides, others from seasonally flooded village responded that prahok could be a good exchange product when they were not able to afford enough food security (rice) for their family.

"Producing prahok is very important for me and my family because it is a main source of my family income. Moreover, it is a career throughout my family generations (my mother is also a prahok maker). If I can produce a large amount of prahok, I get more income. If buying prahok from the market is cheaper than buying fish to make prahok, I still continue making prahok by myself. My family prefers homemade prahok than buying prahok from the markets because it is delicious and safe." (Female respondent, 60, seasonally flooded village & Female respondent, 64, displaced village, professional group, in-depth interviews, 2022)

"Processing prahok is very important for my family. When I have no money to buy foods, I can sell it to get the money or exchange it with other to get paddy rice. As I used to exchange, 5Kg of prahok can get 100Kg of paddy rice (it equals 100,000 riel)." (Female respondent, professional group, seasonally flooded village, in-depth interviews, 2022)

According to the changes in current prahok production among professional prahok makers, this study figured out that there were two main factors that affected their prahok production, particularly a decrease in the amount of producing prahok and income generation from prahok production. Firstly, increasing the price of inputs was one among other factors that affected prahok production among professional prahok makers. Based on responses from the majority of respondents, the study found that the current price of fresh fish water and salt for making prahok increases. In the past, the price of salt was from 500-800 riel/kg, and the price of fish was from 1,500-2,300 riel/kg. At the present, the price of salt is from 1,000-1,200 riel/kg, and the price of fresh fish water is from 2,000-3,000 riel/kg. However, the price of salt and fresh fish might slightly difference from one area to another area and change from time to time.

Notably, the increasing price of fish often affected to prahok production of those professional prahok makers who bought fresh fish water from others to make prahok. For those prahok makers who lived in the displaced village, they sometimes needed to buy water or spent money to travel to the place nearby water source in order to process prahok as their current living place is far away from the water body. Thus, it indicates that the change in inputs cost (water, salt, fish) mattered for prahok production among prahok makers who used to make prahok selling. According to this result, the study by De Silva (2011) also revealed that Cambodian fish processors often face difficulties with the high cost of water, salt, and the

increasing price of fresh fish. The different perspectives of the respondents in group 2 are presented below.

> *"I need to spend much money than before for making prahok due to change place of living such as buying water. The price of salt also increases compared to the last 5 or 10 years. Before, the price of salt was only 600 riel or 800 riel per Kg. Now, its price is from 1,000 riel to 1,300 riel per Kg."*(Female respondent, 38, professional group, displaced village, in-depth interviews, 2022)

> *"Normally, I produce prahok from buying fresh fish water from other to make prahok. Currently, I decreased amount of producing prahok in my family due to increasing price of salt and fresh fish. In the past, price of fresh fish is only 2,000-2,500riel/kg while price of salt is only 800riel/kg. Now, price of fish is from 3,000-3,800 riel/kg whereas price of salt is 1,200riel/kg."*(Female respondent, 60, professional group, seasonally flooded village, in-depth interviews, 2022)

Secondly, this study found that change in consumer preference was also a factor that affected prahok production among professional prahok makers. Due to the negative effect (decrease in numbers of prahok buyers) of this factor, they currently produced prahok for selling within less amount of prahok than before. The reasons that customers bought less prahok from them might be their personal preference, the cheap price of prahok in the market, and the livelihood conditions of the customers. Based on these issues, some prahok makers mentioned that the city people might not like eating prahok as rural people. For those rural people who have poor income, they might like to buy less prahok as the current farm gate price of prahok is more expensive than before, and they might like to buy some types of prahok in the market that has cheaper price than farm gate prahok. Therefore, the professional group produced less amount of prahok than before.

> *"During the last 5 years, there were many prahok buyers. Nowadays, price of prahok at the farm gate is more expensive; people who have better income will be able to buy prahok. Those who have poor income may decide to buy prahok from the market. From my experience, the amount of selling prahok in my family hightly decreased than before."*(Female respondent, 50, professional group, seasonally flooded village, in-depth interviews, 2022)

5.2.2 Consumption

Based on the study's findings from professional prahok makers (group 2), the study found that there were various ways of consuming prahok in the households of respondents in group 2. Yet, the ways of consuming prahok in each household might be different from each other depending on food preferences, habits or eating attitudes, and local cuisine. Regarding types of prahok, they often use Prahok Sach for their daily foods in the families. This kind of prahok is their homemade prahok. They get Prahok Sach by separating and selecting prahok from the amount that they produced for selling.

Even though the ways of consuming prahok were different from one household to another household depending on food preference, habit or eating attitudes, and local cuisine, the result of the study did not find any changes in terms of the amount of prahok consumption in their households due to the change in their prahok production patterns. Based on the majority of responses, they always kept good prahok for their daily consumption and they never lacked prahok for home consumption because they were professional makers. Up to now, they always kept and consumed 10 kg of prahok per year. Indeed, the way and amount of putting prahok into each type of food are still the same as before even though there was decreasing in their prahok production.

> *"Before and now, my family has kept prahok only around 10kg/yr for home consumption."* (Female respondent, 60, professional group, seasonally flooded village, in-depth interviews, 2022)

Therefore, it indicates that there have not been any noticed changes in terms of prahok consumption in households among professional prahok makers from the past until now. They consumed prahok with the same habits as usual. In addition, it also reflects that the preference for cooking foods containing prahok among the households of professional prahok makers remained stable. Furthermore, the decrease in the amount of produced prahok in their households did not cause any matters on the amount of prahok consumption in their families.

5.2.3 Summary

The fermented fish paste (Prahok) production among professional prahok makers (group 2) refers to individual processors who produced prahok for both selling and home consumption (a large amount of prahok is for selling). Their prahok productions were being made from

various sources of fish such as their own fish caught, buying fresh fish and/or fish meat from others to process into prahok. The activities of their making prahok are more likely close to commercial and circular economic activities. The attached meaning of making prahok among professional prahok makers is more related to economic and cultural roles rather than food roles. Currently, there were changes in prahok production patterns among people in this group. This study found that increasing the price of inputs and changes in consumers' preferences were the main factors that affected their prahok production. Particularly, these factors caused to change in the amount of their producing prahok (moderately decreased amount of producing) and decrease income generation from prahok. Besides, this study also observed that these factors did not make them change their purpose of making prahok and the type of prahok for producing. All of them have continued making both Prahok Sach and Prahok Choeng for selling and home consumption. In addition, this study did not find any changes in terms of women's and men's roles in the household and prahok production among people in group 2. The prahok production has been still involved by women, and other members of the households, and also hiring several labors at the beginning stage of the processing process. Furthermore, prahok production played crucial roles for their families including income, professional career, ancestor's career, food preservation, or food security.

In terms of prahok consumption in the household, prahok is a significant ingredient among prahok makers in group 2 that cannot lack in their daily foods, especially Khmer traditional foods. They normally consumed Prahok Sach, and always preferred homemade prahok. In terms of experiences and ways of using and amount of putting in their prahok consumption, it might be the differences from one household to another household. It was noticed that there were no changes in prahok consumption patterns among the professional group. Additionally, the amounts of prahok for consumption in their households remain stable even though the amount of producing prahok in their families moderately decreased. They have kept and preferred to consume the same amount of prahok as usual.

5.3 Fresh fish/Semi-processed prahok Sellers (group 3)

This section discusses the changes in prahok production and consumption patterns among people in group 3 based on their experiences of producing and consuming prahok and figures out the factors that affected their prahok production and made them into this group of prahok production.

5.3.1 Production

Fresh fish/Semi-processed prahok sellers (group 3) refer to individual processors who switched from processing and selling prahok to selling fresh fish/semi-processed prahok sellers. In other words, fresh fish/semi-processed prahok sellers mean those who were professional prahok makers in the past time but currently produce prahok for only home consumption. Thus, the former characteristics of prahok makers in group 3 are quite similar to the characteristics of prahok makers in group 2.

Based on in-depth interviews among the respondents in group 3, the purpose and size of their prahok productions have changed. Currently, their prahok production sizes are micro-scale at the household level. Formerly, they used to make prahok for both selling and home consumption. In the past, a part of their household's income also got from prahok production. At the present, they just produce prahok for only home consumption purpose and no more income getting from prahok. Indeed, some of them did not regularly make prahok. They sometimes also bought prahok from other villagers for daily consumption in their families. The amount of producing prahok at the current time is based on separating the amount of fish between fish for selling and fish for making prahok, or remaining fish from selling. Regarding the types of prahok, they currently produced only Prahok Sach. In past experiences, most of them could produce prahok from 20 kg to over 100 kg per year for purposes of selling and consumption. At the present, the amount of their producing prahok is under 50kg/yr.

> *"At the present, I just make prahok for home consumption because my family cannot catch more fish and change place of my living, too. Before, my family produced prahok for both consumption and selling about 70Kg per year. Now, I produce prahok around 40Kg per year (10Kg for home consumption and 30Kg for sharing my relatives)."* (Female respondent, 61, fresh fish/semi-processing group, displaced village, in-depth interviews, 2022)

As prahok production used to be a part of income family income among people in group 3, this study also observed that they were currently no more income generation from prahok due to the changes in prahok production patterns (amount of production and purpose). According to this matter, the responses from some respondents showed that their families lost a part of their income after stopped making prahok for selling. In terms of gender roles, this study

found that women still did many tasks compared to men in either household work or economic activities even though they did not spend much time processing prahok like before. A case from a female respondent in the seasonally flooded village showed that she did not have a lot of spare time though she already stopped making prahok for selling. The working hours in the family and outside activities still needed to spend more time to do it. Currently, her husband also irregularly went fishing and worked as hired labor instead. She also added that married women often had high responsibilities in the family compared to men. Men only had responsibilities for earning income to support the family because they are household heads. For other tasks in the household, men rarely engaged in it.

Even though they currently switched their purpose of making prahok for selling to only make it for home consumption, some of them expressed that they still desired to continue making prahok for home consumption while others might like to buy prahok from other villagers for their home consumption. Those who were willing to make prahok thought that homemade prahok was good food preservation and safe for eating. Indeed, all members of their family prefer homemade prahok rather than buying prahok from the market. They thought that prahok in the market is not delicious and might also contain chemical components.

> *"Making prahok is importance for my family as food ingredient for daily diet. It is also good food preservation and healthy. Moreover, prahok shows identity of Cambodian in terms of food and culture. I never buy prahok from the market because I feel unsafe (it may contain chemical components). If I make prahok by myself, I can select good and big fish to make good quality of prahok."* (Female respondent, 61, fresh fish/semi-processing group, seasonally flooded village, in-depth interviews, 2022)

> *"Making prahok is importance for my family because it is good food preservation. My family cannot lack it. I will continue to make prahok depending on my capability. I still make prahok though it is only 1Kg of prahok. I don't want to buy prahok from the market."* (Female respondent, 60, fresh fish/semi-processing group, displaced village, in-depth interviews, 2022)

According to the changes in current prahok production among people in group 3, this study figured out that there were three main factors that affected their prahok production and led to changes in their prahok production patterns, particularly switching purposes of making

prahok, decrease in the amount of producing prahok, and no more income generation from prahok production. The first factor was the decrease in the amount of producing prahok. Due to the negative effects of decreasing amount of fish caught, some prahok makers who used to make prahok for selling switched from producing prahok for selling to selling fresh fish or semi-processed prahok, and only produced prahok for home consumption, whereas others still continued producing prahok for selling as usual.

Particularly, many respondents in group 3 complained that they currently switched from making prahok for selling to only making it for selling because the current amount of fish caught moderately decreased compared to the time that they used to go fishing. They currently could catch less amount of fish than before due to changes in fish resources and difficulty in access to the fish resource. There were some reasons for the changes in the fish resource such as cutting down forests, climate change, illegal fishing, growing numbers of fishers, and water pollution (e.g. poor waste management in the Tonle Sap water, spraying weeds in soybean fields which were planted nearby the Tonle Sap lake), and fishing shell by using modern fishing tools.

Geographical living conditions and changes in nature (e.g strong wind) were other factors that caused them difficulty in access to fish resources. Particularly, all the respondents in the displaced village faced difficulties in access to the fish resource as their current living place is far from the fish resource. They need to travel long distances from their place of living to the fish resources, the high cost of traveling to fish, and spend money for keeping a boat or canoe with others who stayed nearby the water. With regards to all the respondents in the seasonally flooded village, they currently also faced difficulties in access to fish resources even though they have not been displaced. Due to climate change (e.g strong wind, change in the water level), many of them responded that they felt difficulty in access to the fish resource compared to the previous experiences of their fishing.

> A male respondent from seasonally flooded village said that *"From my experiences, the current amount of fish resource decreased compared to the previous time. For the last 5 or 10 year, I could catch fish more than 1 ton. Now, it is less than 1 ton. This year, the level of water is quite high. I hope that I can catch a lot of fish during the peak season. I think that there is still plenty of fish in Tonle Sap lake, but we face difficulty in access to fish resource due to strong wind. I also think that the reasons of change of fish resource are from illegal cutting down forests, and water pollution."*

(Male respondent, 33, fresh fish/semi-processing group, seasonally flooded village, in-depth interviews, 2022)

A male respondent from displaced village also pointed out that *"Currently, the amount of catching fish decreased. I can catch fish from 300-400Kg/yr. In the past years, I could catch fish from 500-700Kg/yr. After displace (since 2018), I have felt difficult in access to water and fish resource, especially for processing prahok. The amount of producing prahok also decreased as I could not catch plenty of fish. In dry season, I have to go down to the place that nearby the water and tent camping there to processing prahok."* (Male respondent, 28, professional group, displaced village, in-depth interviews, 2022)

The second factor was the change in market trends. The result of this effect caused some prahok makers to switch from producing prahok for selling to selling fresh fish or semi-processed prahok. However, they still continued processing prahok for home consumption. According to the study's findings, the reason for changes in market trends was that there was less requirements for prahok from middlemen and wholesalers at present time. Many middlemen or wholesalers currently preferred to buy semi-processed prahok or fish meat, and then process it into prahok by themselves. Because the price of semi-processed prahok is cheaper than the final prahok, they can increase their profit by reducing the input costs of their production.

"Last few years, I could sell prahok 50Kg to 200Kg. Recently, many middlemen and wholesalers like to buy semi-processed prahok to process into final prahok by themselves. Now, some of them buy prahok from me around 70Kg or 80Kg."(Female respondent, 60, professional group, seasonally flooded village, in-depth interviews, 2022)

"Currently the amount of buying prahok of middlemen and wholesalers from me and other villagers moderate decreased compared to the time that I used to sell prahok. Now, they prefer to buy semi-processed prahok rather than buying final prahok." (Female respondent, 38, professional group, displaced village, in-depth interviews, 2022)

The third factor was that time saving and the easiest of selling fresh fish or semi-processed prahok. Time-saving and the easiest of selling fresh fish or semi-processed prahok was also found to be a factor that affected prahok production among those who used to produce prahok for selling, particularly people in group 3. The negative effects of this factor made some prahok makers change their purpose of producing prahok for selling to selling fresh fish/semi-processed prahok. The majority of them responded that selling fresh fish/semi-processed prahok is easier to do than processing prahok as they currently need daily income. In addition, it can save time for them to do household chores and other work to get extra income to support their livelihoods. However, they still continued processing prahok for home consumption purposes.

> *"I currently prefer to make semi-prahok and fish meat than final prahok as it is easy to do and can get immediately income. This is because of the large demanding from middlemen and wholesaler. Indeed, I don't have a place to dry it, too."* (Female respondent, 26, fresh fish/semi-processing group, seasonally flooded village, in-depth interviews, 2022)

5.3.2 Consumption

In terms of prahok consumption in the households among the respondents in group 3, the result of the study showed that there were various ways of prahok consumption in each household based on their food preferences, habits, and eating attitudes among members of their families. Relating to types of prahok, they often consumed Prahok Sach for daily foods in the families. As they switched purpose of making prahok, they did not often have homemade Prahok Sach for daily consumption in the families. Some of them sometimes also bought Prahok Sach for home consumption. In addition, they often preferred buying prahok from their villagers if they had to buy prahok for their consumption. This is because prahok was made by their villagers, and it was safer than prahok in the market.

> *"Making prahok is importance for my family because it is good food preservation. My family cannot lack it. I often make prahok Sach for home consumption. I will continue to make prahok depending on my capability. I still make prahok though it is only 1Kg of prahok. I don't want to buy prahok from the market because I don't feel delicious and safety."* (Female respondent, 60, fresh fish/semi-processing group, displaced village, in-depth interviews, 2022)

Regarding the amount of prahok consumption in their family, the study found that they currently consumed less amount of prahok than before. Even though they still produced prahok for home consumption, prahok is being made only in the time that had available fish. As they faced problems with household income, a large amount of fish caught was immediately sold instead of producing prahok to earn more income for everyday life. Thus, it indicates that the decrease in the amount of produced prahok among the respondents in group 3 influenced the amount of prahok consumption in their families. Before, they often kept and consumed prahok around 10Kg for whole year consumption. Currently, each household only consumes prahok approximately 7Kg per year.

> *"Generally, my family keeps 10 kg/yr for daily consumption. This year, I made only 6 Kg of prahok for consuming and sharing with my relatives. I decide to produce less amount of prahok than before because almost fish caught is sold to get immediate income for supporting my family."* (Female respondent, 64, fresh fish/semi-processing group, displaced village, in-depth interviews, 2022)

On the other hand, the changes in habits of consuming prahok in the households also mattered the amount of prahok consumption in their families. Some of them decided to frugally consume prahok. Particularly, a case from a female respondent in the seasonally flooded village expressed that they often put a large amount of prahok into everyday foods (foods that need to cook with prahok) in the past time. This is because their family likes eating prahok. Now, they need to put less amount of prahok into soups than before. Moreover, the study also found that some respondents in group 3 decided to buy extra prahok for their home consumption when they lacked prahok for consumption. This case was found among the respondents in the displaced village. Through in-depth interviews, they responded that they sometimes had to buy prahok from other villagers as they could not produce a large amount of prahok as before. Indeed, the current place conditions were not in good conditions for either fishing or prahok processing.

> *"During the time that my family could produce large amonun of prahok, we normally like to put large amount of prahok into daily foods. My husband and I like heavy smell of prahok in each type of food. Now, we put less amount of prahok than before as we cannot produce much amount of prahok."* (Female respondent, 26, fresh fish/semi-processing group, seasonally flooded village, in-depth interviews, 2022)

".....after relocating, my family faced many difficulties in living and processing prahok. Currently, we irregular produce prahok. My family sometimes also buys prahok from people in the village for our daily consumption." (Female respondent, 61 & female respondent 60, fresh fish/semi-processing group, displaced village, in-depth interviews, 2022)

5.3.3 Summary

The fermented fish paste (Prahok) production of fresh fish/semi-processed sellers (group 3) are former prahok makers who used to make prahok for selling. This study found that the decrease in the amount of fish caught, change in the market trend, time-saving and the easiest of selling fresh fish or semi-processed prahok were the factors that made them into another group of prahok production and changed their prahok production patterns. Currently, prahok production was not their primary job. They just produced prahok for only home consumption purpose which was being made by separating the amount of fish for selling and fish for making prahok or remaining fish and spoiled fish from selling. Moreover, the attached meaning of making prahok among people in group 3 at the current time was related to food roles instead of economic roles. Regarding types of prahok, they switched from producing both Prahok Sach and Prahok Choeng to only producing Prahok Sach. Their prahok production also changed from small-scale to micro-scale at the household level (under 50kr/yr). Furthermore, gender roles in the household and prahok production among people in group 3 also changed. Current prahok production is only involved by women and no more hiring labors. As they changed the purpose of making prahok, their families were also no more income generation from making prahok. Several of them also needed to buy prahok from other villagers to meet the consumption demand in their families which led to increasing food expenses.

In terms of prahok consumption in the household, prahok is a significant ingredient among prahok makers in group 3 that cannot lack in their daily foods, especially Khmer traditional foods. They normally consumed Prahok Sach, and always preferred homemade prahok. Due to the changes in prahok production patterns, the amount of prahok consumption in their family also decreased. Moreover, some of them also bought prahok from other villagers for consumption due to the lack of prahok in the families. In terms of experiences and ways of using and amount of putting in their prahok consumption, it might be the differences from

one household to another household. Currently, they frugally consumed prahok as they could not produce a large amount of prahok like before.

5.4 Quitting Prahok makers (group 4)

This section discusses the changes in prahok production and consumption patterns among people in group 4 based on their experiences of producing and consuming prahok and figures out the factors that affected their prahok production and formed them as quitting prahok makers.

5.4.1 Production

Quitting prahok makers (group 4) refer to individual processors who used to produce prahok for either home consumption or selling purposes, but now no more producing prahok for any purposes. The former characteristics of prahok makers in group 4 are similar to the characteristics of prahok makers in either group 1 or group 2. After quitting prahok production, some of them worked as freshwater fish or fish meat sellers while others worked as hired labors (cutting fish heads) and caught shells or snails. Besides, they also did some secondary jobs such as planting vegetables, raising chickens,...etc. After quitting prahok production, women's and men's roles in their families and prahok production also changed. Currently, some women only stayed home and do household chores while other women were busy working other jobs. Similarly, some men only stayed home and were no more involved in fishing while others worked as hired labors or found other jobs instead of fishing.

Before quitting prahok production, some respondents in group 4 used to make prahok for selling while others used to make prahok for only home consumption. They used to produce either prahok Sach or prahok Choeng for home consumption or selling. During the time making prahok, some of them used to make prahok from made prahok from their fish caught or remaining fish from selling, whereas others used to produce prahok by buying fish from others and then processing it into prahok. In addition, the average amount of produce prahok depended on the quantity of fish caught and the purposes of producing it. For those who produced prahok for home consumption, the average amount of producing prahok was from 3Kg to 15Kg. For those who produced prahok for selling was from 50 kg to over 300 kg per year. Their purposes of making prahok included earning income/additional income, food preservation, food safety (prefer homemade prahok), and career throughout generations.

According to some influential factors including lack of capital, time-consuming of producing prahok, and change in living patterns, prahok makers in group 4 currently stopped producing for neither consumption nor selling purposes.

Through in-depth interviews among respondents across the areas of the study, lack of capital was found as a factor that affected prahok production among prahok makers who used to produce prahok for selling. Due to this effect, some of those prahok makers currently stopped producing prahok anymore. As prahok needs to store for a long time before selling, capital is needed for running prahok production. In addition, they stopped making prahok and find other alternative jobs instead of making prahok to support their livelihoods because of livelihood constraints and difficulties in processing prahok. Difference perspectives of the respondents on this matter were presented below.

> *"I stopped making prahok because I don't have enough money to make and store it for selling. In addition, I need daily income to support my family. Thus, I decided to work as hired labor to get daily income."* (Female respondent, 48, quit group, seasonally flooded village, in-depth interviews, 2022)

> *"Now, I do lack of capital to producing prahok. I feel so sad as well as I was changed place of living which is far away from fish and water resources. I am not able to produce prahok anymore."* (Female respondent, 67, quit group, displaced village, in-depth interviews, 2022)

Time-consuming of producing prahok was also a factor that affected prahok production among prahok makers who used to produce prahok for selling. Time-consuming here refers to the time of storing or processing prahok. As prahok is quite time-consuming in terms of storage (need to keep up to two or three months before selling), it caused a key challenge for them to process it as well as get income. Therefore, this factor caused some of them to stop running their prahok production.

> *".....I stopped making prahok because making prahok takes much time to do it. It also needs to store long period before getting the income. Currently, my family had problems with income. We need daily income, so that I decide to stop making prahok and do something that is easy and get quick money."* (Female respondent, 48, quit group, displaced village, in-depth interviews, 2022)

Another factor was that the change in living patterns. Through in-depth interviews with all respondents in the displaced village (V2), change in living patterns was also the factor that affected prahok production among prahok makers who used to make prahok for either home consumption or selling. Due to this effect, some of prahok makers who used to make prahok for home consumption stopped producing prahok anymore, whereas some of those who used to make prahok for selling also stopped running their prahok production. This is because they currently faced difficulties in processing fish and living after relocating. The current place of their living is far from the water body and fish resources which made them difficult in processing prahok. In addition, the current living place also needed to spend a lot of money for their living, especially on water and electricity.

> *"Since displacing, I need to spend money for hiring motorbike to travel from my place to water resource. I place. Everything in the new living place is all expensive. Nowadays, price of fish also do not know how to drive motorbike. I think that living on the water is better than living in current expensive. It is about 4,000 riel/Kg. I do not have enough money to buy and make it into prahok."* (Female respondent, 67, quit group, displaced village, in-depth interviews, 2022)

> *"I stopped making prahok due to difficulty in access to fish resource and lack of water for cleaning fish. Due to change place of living, my sons do not often go fishing as before. They work as hired labor (lifting shells) rather than go fishing.* (Female respondent, 54, quit group, displaced village, in-depth interviews, 2022)

5.4.2 Consumption

In terms of prahok consumption, the study among the respondents in group 4 revealed that each household has various ways of prahok consumption based on their food preferences, habits, and eating attitudes among members of their families. After quitting prahok production, they currently consumed either Prahok Sach or Prahok Choeng depending on the money that they could buy prahok. Though they had to buy prahok for home consumption, most of them preferred buying prahok from people in their villages rather than buying it from the market. They thought that prahok made by villagers was hygienic and safe compared to prahok in the market.

Moreover, the study also found that the current amount of prahok consumption in their households is highly reduced compared to the time that they used to produce prahok. During the time making prahok, they used to consume around 10Kg of prahok for whole year consumption in their families. After quitting prahok, they decided to consume less prahok which accounted for 3 kg or 5 kg per year.

> *"During the time of making prahok, my family used to consume prahok with approximatrly amount which was 6kg to 8 kg per year. After quitting prahok produciton, my family only buys 3kg of prahok for home cosumption per year."* (Female respondent, 54, quit group, displaced village, in-depth interviews, 2022)

According to the changes in prahok production patterns, they currently also changed the ways of consuming prahok in their families. Some of them decided to put less amount of prahok into soups and frugally consumption whereas others decided to reduce cooking foods containing prahok. In particular, a male respondent from the displaced village illustrated that his family currently did not often cook food containing prahok. This is because they stopped producing prahok, and they had to spend money for buying prahok. They currently preferred eating foods that did not contain prahok or contain less prahok.

> *"On average, my family consumes prahok around 8 kg per year. As we stopped producing prahok, we currently consume about 3 or 4 kg of prahok per year. Foods that need to put much amount of prahok (e.g. prahok steam, Tukakrueng,...etc.), we rarely cook. We consume less prahok because we don't have money to buy it, too."* (Female respondent, 48, quit group, seasonally flooded village, in-depth interviews, 2022)

5.4.3 Summary

Quitting prahok makers (group 4) refer to individual processors who used to produce prahok for either home consumption or selling purposes, but now no more producing prahok for any purposes. The former characteristics of prahok makers in group 4 are similar to the characteristics of prahok makers in either group 1 or group 2. This study found that there were three main factors that formed them as quitting prahok makers. These influential factors included lack of capital, time consuming of producing prahok, and change in living patterns. Due to these effects, there was no fermented fish paste (Prahok) production among prahok

makers in group 4. They stopped producing prahok for any purposes (either home consumption or selling).

Due to the changes in their prahok production patterns, it caused matters for their families regarding prahok consumption in the household. After quitting prahok, they consumed either Prahok Sach or Prahok Choeng. They often bought prahok from the people in their villages as they were no more prahok productions in the families. In terms of experiences and ways of using and amount of putting in their prahok consumption, it might be different from one household to another household. Currently, they reduced cooking foods that contained prahok, and frugally consumed prahok than before as they could not produce prahok anymore.

5.5 Comparison and Identifying Affecting Factors on Prahok Production and Consumption among Various Groups

This section aims to illustrate the different changes in patterns in prahok production and consumption among various groups and identify factors affecting prahok production among them. There are two main sub-sections in this section. The first sub-section describes the differences and changes in patterns of prahok production among various groups. The second sub-section describes the different changes in patterns in prahok consumption among various groups.

5.5.1 The Difference Changes in Patterns in Prahok Production among Various Groups

Throughout the results and discussions related to prahok production among 4 groups of prahok makers, it can be seen that there were some key different changes in patterns in prahok production among these four groups. In addition, there were some influential factors that made them into the different groups of prahok production and affected their production in various ways. Table 5.1 illustrated information related to affecting factors and the different changes in patterns in prahok production among various groups of prahok makers in this study.

The different changes in prahok production patterns of each group were looked through some main criteria such as type of prahok for their production, purposes of making prahok, source of fish for making prahok, production scale, labor use, gender roles, amount of producing prahok, income getting from prahok, and significant roles of prahok production. Remarkably,

there was not any information about the prahok production patterns of prahok makers in group 4 as they stopped producing prahok. Based on the results in Table 5.1, it is shown that each group of prahok makers produced different types of prahok. Home consumption prahok makers (G1) and Fresh fish/Semi-processed prahok sellers (G3) currently produced Prahok Sach, whereas professional prahok makers (G2) have produced both Prahok Sach and Prahok Choeng. The reason is that both prahok makers in group 1 and group 3 mainly produced prahok for home consumption while prahok makers in group 2 produced prahok for both home consumption and selling. Another reason is that Prahok Sach is more popular and produced for home consumption than Prahok Choeng because of its ease of use in making foods.

Relating to the source of fish for producing prahok, it was found that prahok makers in group 2 often produced prahok from all their own fish caught and/or buying fresh fish or fish meat whereas prahok makers in group 1 often made prahok from remaining fish from selling or spoiled fish. Similar to group 1, prahok makers in group 3 currently also made prahok by separating the amount of fish for selling and fish for making prahok or remaining fish, and spoiled fish from selling as they switched from prahok production to another career. In addition, prahok production is a primary occupation or main source of income for the professional group (group 2), while it is just a secondary occupation or food consumption needed for the home consumption group (group 1) and semi-processing group (group 3). The study also found that each group of prahok makers also had different purposes for making prahok. The activity of producing prahok of group 2 is more related to the commercial purpose and circular economic activities, while the activity of producing prahok of group 1 is more likely related to home consumption and waste fish management. It's also noticed that people in group 3 currently produced prahok for only home consumption purposes (switching from selling to home consumption)

Regarding prahok production scale and labor use, the current size of prahok production among prahok makers in group 1 and group 3 is micro-scale production at the household level (Under 50 kg/yr) and was normally involved by family members. Notably, the size of prahok production among people in group 3 changed from small-scale to micro-scale production. The size of prahok production among professional prahok makers (group 2) is small-scale production at the household level (from 50 kg/yr to 1 ton), and normally involved by family members and irregular hiring labors. In terms of gender roles, this study observed

that there were changes in women's and men's roles and responsibilities in the household and production among people in group 1, group 3, and group 4, whereas there were no changes in gender roles among people in group 2. In the households of people in group 1, men and women are currently less involved in prahok production due to being busy with other income generations. In the households of people in group 3, women currently only engaged in prahok during their spare time (busy with HH's work and other income generations) while men irregularly went fishing or switched jobs. Similar to other groups, some women in group 4 were no more able to produce prahok while others changed careers. Indeed, men in their families were also no more ability to go fishing and switch from fishing to other jobs.

In addition, the change in the amount of producing prahok was also different from one group to another group. It was observed that the current amount of producing prahok among people in group 3 highly decreased (from 100kg/yr to 15kg/yr) compared to their experience of producing prahok, while the current amount of producing prahok of other people in group 2 and group 1 was also gradually decreased. The current amount of producing prahok among people in group 2 moderately decreased from 600kg/yr to 400kg/yr, whereas the current amount of making prahok among people in group 1 slightly decreased from 40kg/yr to 30kg/yr. Furthermore, the change in the amount of producing prahok among prahok makers in group 1, group 2, and group 3 also affected the income generation from prahok for their families in various ways as shown in Table 5.1.

This study also observed that prahok production played various roles for prahok makers of each group in terms of food, economic, and cultural roles. It was noticed that prahok production played significant roles in terms of food preservation, and food security for prahok makers in group 1 and group 3. Conversely, prahok production played vital roles for prahok makers in group 2 in terms of a primary income source for the family; ancestor's career; women's professional career; food preservation, or food security for their families. Thus, it indicates that the attached meanings of making prahok among prahok makers in group 2 are wide and meaningful in comparison with the other two groups (group 1 & group 3).

On the other hand, this study found that there were some main factors that affected prahok production among prahok makers which led to changes in patterns of their production in various ways and made them into different groups of prahok production. Livelihood strategies was found as a significant factor that affected the production of prahok makers who

used to make prahok for home consumption (group 1). Other factors including the increasing price of inputs and change in consumers' preference were the main factors that affected prahok production among those who used to make prahok for selling (group 2), but it did not change their purpose of making prahok. On the other hand, there were three main factors that affected prahok production of those who used to make prahok for selling, and it also caused them to change the purpose of making prahok from selling to selling fresh fish/semi-processed prahok which is known as fresh fish/semi-processed prahok sellers (group 3). Those influential factors included changes in the market trend, time-saving and the easiest of selling fresh fish or semi-processed prahok, and a decrease in the amount of fish caught. They currently produced prahok for only home consumption purposes. Meanwhile, this study also found that there were some factors that affected prahok production of some prahok makers who used to make prahok for either home consumption or selling including lack of capital, time consuming of producing prahok, and change in living patterns. The effects of these factors caused them to stop producing prahok for any purpose. Therefore, this group of prahok makers was categorised into quitting prahok makers (group 4).

Table 5.1 Comparison table of prahok production among four groups of prahok makers

Criteria	Home consumption prahok makers (G 1)	Professional prahok makers (G 2)	Fresh fish/Semi-processed prahok sellers (G 3)	Quitting prahok makers (G 4)
Type of prahok for producing	Prahok Sach	Prahok Sach & Prahok Choeng	Only producing Prahok Sach, no more producing Prahok Choeng	No more prahok production
Source of fish for producing prahok	Remaining fish from selling or spoiled fish	All own fish caught/Buying fresh fish or fish meat	Separating amount of fish for selling and fish for making prahok/Remaining fish, spoiled fish from selling	No more prahok production
Purposes of making prahok	Home consumption and Waste fish management	Commercial purpose and circular economic activities	Consumption needed	No more prahok production
Production scale	Micro scale production at household level (Under 50Kg/yr)	Small scale production at household level (50kg/yr-1ton/yr)	From small scale to micro scale production (Under 50Kg/yr)	No more prahok production
Labor use	Family members	Family members and irregular hiring serveral labors	Only family members, no more hiring labors	No more prahok production
Gender roles	Men and women less involvment in prahok production	- No changes in gender roles	-Women only engaged in prahok during their spare	- Women: No more ability to produce

	due to busy with other income generations		time (busy with HH's work and other income generations) -Men irregular went to fishing or switched jobs	prahok, change career - Men: No more ability to go fishing, change career
Amount of producing prahok	Slightly decreased (from 40kg/yr to 30kg/yr)	Moderately decreased (from 600kg/yr to 400kg/yr)	Highly decreased from 100kg/yr to 15kg/yr	Stop producing prahok
Income getting from prahok	No income generation	Decrease in income getting from prahok	Increase food expense, no more income generation from prahok	Increasing food expense
Roles of prahok production	-Food preservation/Food security - A part of reducing family food expense	- Income - Ancestor's career - Women's professional career - Food preservation/Food security	-Food preservation/Food security	No more prahok production
Affecting factors	Livelihood strategies	- Increase price of inputs - Change in consumers' preference	- Change in market trend - Time-saving and the easiest of selling fresh fish or semi-processed prahok - Decrease in amount of fish caught	- Lack of capital - Time consuming of producing prahok - Change in living patterns

Source: In-depth interviews, 2022

5.5.2 The Difference Changes in Patterns in Prahok Consumption among Various Groups

Due to the changes in prahok production, the patterns of prahok consumption among various groups also changed. The result of this study revealed that there were key difference changes in prahok consumption patterns from one group to another group of prahok makers regarding the type of prahok for consumption in the household, where to get prahok for consumption, amount of prahok consumption, and current ways of using prahok. Table 5.2 illustrated information related to the different changes in prahok consumption patterns among 4 groups of prahok makers in this study. Based on the results in Table 5.2, it is shown that almost groups of prahok makers still preferred Prahok Sach for their home consumption, whereas only people in group 4 sometimes consumed Prahok Choeng. This is because they currently

bought prahok from others for their home consumption after quitting prahok production. Indeed, most people in group 4 could not afford enough money to buy Prahok Sach for consumption. Moreover, this study also revealed that people in group 1 and group 2 always produced prahok by themselves for home consumption while people in group 4 bought prahok from others for their home consumption. It was also noticed that people in group 3 did not often produce prahok for home consumption. They currently also bought prahok from others in their villages when they lacked prahok for consumption in their family.

Furthermore, the study also found that there were different changes in the amount of prahok consumption in the families among various groups. The current amount of prahok consumption in the households of group 1, group 3, and group 4 also decreased. Currently, the amount of prahok consumption in group 1 decreased from 15kg/yr to 10kg/yr whereas the amount of prahok consumption in group 3 and group 4 decreased from 10kg/yr to 7kg/yr and from 10kg/yr to 4kg/yr respectively. Due to the changes in the amount of prahok consumption, prahok makers in group 1 changed the ways of using prahok in their family by slightly putting less amount of prahok than before, while prahok makers in group 3 decided to frugally consume. Similar to prahok makers in group 3, prahok makers in group 4 also decided to frugally use prahok and reduce cooking foods containing prahok as they could not produce prahok anymore. Conversely, the amount of prahok consumption in the household of group 2 remained stable which accounted for 10kg/yr. This is because prahok makers in group 2 are professional prahok makers. Even though the amount of produced prahok currently decreased, they still kept and consumed the amount of prahok as usual.

Table 5.2 Comparison table of prahok consumption among four groups of prahok makers

Criteria	Home consumption prahok makers (G1)	Professional prahok makers (G2)	Fresh fish/Semi-processed prahok sellers (G3)	Quitting prahok makers (G4)
Type of prahok for consumption in the household	Prahok Sach	Prahok Sach	Prahok Sach	Prahok Sach/Prahok Choeng
Where to get prahok for consumption	Homemade prahok	Homemade prahok	Homemade prahok &buying prahok from the villagers	Buying prahok from the villagers
Change in amount of prahok consumption in the family	Decreasing from 15Kg/yr to 10Kg/yr	10Kg/yr (stable)	Decreasing from 10Kg/yr -7Kg/yr	Decreasing from 10Kg/yr to 4Kg/yr

Current ways of using prahok due to the change in amount of prahok consumption	Slightly put less amount of prahok than before	Still put amount of prahok as usual	Frugally consumption	-Frugally consumption -Reducing cooking foods containing prahok

Source: In-depth interviews, 2022

5.6 Chapter Summary

This chapter illustrates the changes in patterns in prahok production and consumption among prahok makers in the study areas, identifying the affecting factors, and then making a comparison of changes in patterns in prahok production and consumption among various groups. The results of the study revealed that the current prahok production and consumption patterns of prahok makers changed due to some factors. The effects of these factors also made them into different groups of prahok production. In particular, there were four groups of prahok makers due to the effects of those factors which were named: Home consumption Prahok makers (group 1); Professional prahok makers (group 3); Fresh fish/Semi-processed prahok sellers (group 3); and Quitting prahok makers (group 4). The affecting factors included livelihood strategies; increasing price of inputs; change in consumers' preference; decrease in the amount of fish caught; change in market trend; time-saving and the easiest of selling fresh fish or semi-processed prahok; lack of capital; time-consuming of producing prahok; and change in living patterns. However, the different group of prahok production has different affecting factors, and those affecting factors also led to changes in their prahok production and consumption patterns in various ways.

Firstly, the study revealed that livelihood strategies affected the production of prahok makers who used to make prahok for home consumption (group 1). However, they currently still continued making prahok for home consumption. Due to the affecting factor, there were changes in prahok production patterns among the home consumption group at the current time. Particularly, the change in the amount of producing prahok (slightly decreased amount of producing) and the change in women's and men's roles in their families. However, this study also observed that this factor did not make them change their purpose of making prahok and the type of prahok for producing. All of them have continued making Prahok Sach for home consumption. Normally, they produced prahok from remaining fish from selling or abandoned fish. It indicates that their activity of processing prahok was more related to

complement job or waste fish management activity. Moreover, prahok still plays significant roles in terms of food preservation or food security for them even though there were some changes in their prahok production patterns.

In terms of prahok consumption in the household, they often consumed Prahok Sach, and always preferred homemade prahok. This is because homemade prahok is considered a kind of prahok without any chemicals and safe to eat or use as an ingredient for their daily cooking foods. In terms of experiences and ways of using and amount of putting in their prahok consumption, it might be differences from one household to another household. Due to the decrease in the amount of producing prahok in their families, there was a change in the amount of prahok consumed in each household. They currently consumed less amount of prahok than before by slightly putting less amount of prahok into foods.

Secondly, this study found that there were two main factors that affected prahok production among those who used to make prahok for selling, but they did not change their purpose of making prahok (group 2). These affecting factors included increasing the price of inputs and change in consumers' preference. Due to the effects of these factors, there were some changes in prahok production patterns among people in this group. Particularly, these factors caused to change in the amount of their producing prahok (moderately decreased amount of producing) and decrease income generation from prahok. This study also observed that these affecting factors did not make them change their purpose of making prahok and type of prahok for producing. All of them have continued making both Prahok Sach and Prahok Choeng for both selling and home consumption. Up to the present, the activities of their making prahok are more likely close to commercial and circular economic activities. The attached meaning of making prahok among professional prahok makers is more related to economic and cultural roles rather than food roles. In addition, this study did not find any changes in terms of women's and men's roles in the household and prahok production among people in group 2 according to the changes in production patterns. The prahok production is still involved by women, other members of the households, and also hiring several labors at the beginning stage of the processing process. Furthermore, prahok production played crucial roles for their families including income, professional career, ancestor's career, food preservation, or food security.

In terms of prahok consumption in the household, the professional group (group 2) often consumed Prahok Sach, and preferred homemade prahok. In terms of experiences and ways of using and amount of putting in their prahok consumption, it might be the differences from one household to another household. It was noticed that there were no changes in prahok consumption patterns among professional group even though their prahok production changed. Additionally, the amounts of prahok for consumption in their households remain stable even though the amount of producing prahok in their families moderately decreased. They have kept and preferred to consume the same amount of prahok as usual.

Thirdly, this study figured out that there were three main factors that affected prahok production of those who used to make prahok for selling, and it also caused them to change the purpose of making prahok from selling to selling fresh fish/semi-processed prahok. They currently produced prahok for only home consumption purposes. Through their current situation, these people were re-classified into group 3 (Fresh fish/Semi-processed prahok sellers). These affecting factors included a decrease in the amount of fish caught, a change in the market trend, time-saving, and the easiest of selling fresh fish or semi-processed prahok. Due to the effects of these factors, their prahok production was not their primary job anymore. They just produced prahok for only home consumption purposes which were being made by separating the amount of fish for selling and fish for making prahok or remaining fish and spoiled fish from selling.

Moreover, the attached meaning of making prahok among people in group 3 at the current time was related to food roles instead of economic roles. Regarding types of prahok, they switched from producing both Prahok Sach and Prahok Choeng to only produced only Prahok Sach. Their prahok production also changed from small-scale to micro-scale at the household level (under 50kr/yr). Furthermore, gender roles in the household and prahok production among people in group 3 also changed. Current prahok production was only involved by women and no more hiring labors. As they changed the purpose of making prahok, their families were also no more income generation from making prahok. Several of them also needed to buy prahok from other villagers to meet the consumption demand in their families which led to increasing food expenses.

Due to the changes in prahok production patterns, the amount of prahok consumption in their family also decreased. Moreover, some of them also bought prahok from other villagers for consumption due to the lack of prahok in the families. In terms of experiences and ways of

using and amount of putting in their prahok consumption, it might be the differences from one household to another household. Currently, they frugally consumed prahok as they could not produce a large amount of prahok like before.

Fourthly, this study also found that there were some factors that affected prahok production of some prahok makers who used to make prahok for either home consumption or selling including lack of capital, time consuming of producing prahok, and change in living patterns. The effects of these factors caused them to stop producing prahok for any purposes. According to this situation, these people were re-classified into another group of prahok makers which was named as Quitting prahok makers (group 4). Due to these effects, there was no fermented fish paste (Prahok) production among prahok makers in group 4. They stopped producing prahok for any purposes (either home consumption or selling).

Due to the changes in their prahok production patterns, it also caused matters for their families regarding prahok consumption in the household. After quitting prahok, they consumed either Prahok Sach or Prahok Choeng depending on their HH's income. They often bought prahok from the people in their villages as they were no more prahok productions in the families. In terms of experiences and ways of using and amount of putting in their prahok consumption, it might be different from one household to another household. Currently, they reduced cooking foods that contained prahok, and frugally consumed prahok than before as they could not produce prahok anymore.

According to the changes in patterns in prahok production and consumption among various groups, this study also found that there were some key different changes in patterns in prahok production and consumption from one group to another group. The key different changes in patterns in prahok production among various groups of prahok makers included the type of prahok for their production, purposes of making prahok, source of fish for making prahok, production scale, labor use, gender roles, change in the amount of producing prahok, income getting from prahok, and significant roles of prahok production. The detailed information related to key different changes in patterns in prahok production and consumption from one group to another group was presented in Table 5.1. In terms of the differences in prahok consumption among various groups of prahok makers in this study, it was noticed that the type of prahok for consumption in the household, where to get prahok for consumption, amount of prahok consumption, and current ways of using prahok are the key different changes in prahok consumption patterns among various groups of prahok makers. Detailed

information related to the key different changes in prahok consumption patterns among various groups of prahok makers in this study was presented in Table 5.2.

CHAPTER 6
REASONS FOR CHANGES IN PRAHOK PRODUCTION AND CONSUMPTION PATTERNS

This chapter aims to illustrate and explain reasons for changes in prahok production and consumption patterns among various groups of prahok makers. In addition, this chapter also illustrates how people from different groups of prahok production feel about the changes in their prahok production and consumption, and further deeply understands how they see their prahok production when they changed it. There are six sections in this chapter. The reasons for changes in patterns of prahok production and consumption among four groups of prahok production are illustrated in the first, second, third, and forth sections accordingly. A summary and reflection on the reasons for changes among various groups are presented in the fifth section. The sixth section is about the chapter summary.

6.1 Home Consumption Prahok makers (group 1)

This section shows different perceptions or feelings among people in the home consumption group due to the changes in their prahok production, and reasons for changes in their prahok production and consumption. Additionally, this section also looks at their further perceptions of seeing prahok production after they changed it. The detailed discussions about this group are presented in the following sub-sections.

6.1.1 Emotions about the Changes

Based on the study's findings, home consumption prahok makers (group 1) have continued to produce prahok for home consumption. However, they currently produced less amount of prahok than before. The change in the amount of producing prahok caused to decrease in the amount of prahok consumption in their families. Through in-depth interviews, this study found that the respondents from group 1 did not express any concern feelings due to the effect of these changes. This is because making prahok was just their secondary job or waste fish management activity that they often engaged in during their spare time or when there was plenty of fish.

> *"Currently, I can produce less amount of prahok than before. I think that it is normal because I just make it when my family can catch plenty of fish. Moreover, I just make*

it for home consumption and we do not often consume it." (Female respondent, 37, home consumption group, seasonally flooded village, in-depth interviews, 2022)

The case from male respondents also gave information that the change in prahok production in their family did not make them feel distressed. This is because their family just made prahok when their wives were free of work and only made it for home consumption. Most of the time, they spent time earning income from other activities such as farming and selling vegetables or fish. Thus, it indicates that the change in prahok production did not cause any matters in the home consumption group.

A male respondent said that: *".....From my observation, the amount of producing prahok in my family slightly decreased than before. However, I did not hear a complaining about this matter from my wife. She just told me that she sometimes feels lazy in making prahok because she is busy with selling vegetables."* (Male respondent, 34, home consumption group, displaced village, in-depth interviews, 2022)

6.1.2 Reasons for Changes and Further Seeing Prahok Production

Based on the study's findings among respondents in group 1, there were two main reasons for changes in prahok production among people in group 1. Firstly, lack of time was a reason for the change in prahok production among respondents in group 1. Through in-depth interviews, income generation among women in this group was not from prahok production. Currently, they were busy with other income generations and household chores. Thus, they did not have much time to make prahok as before. They just made prahok for home consumption when they were available or when there was consumption demand in their families.

Secondly, this study also noticed that change in food preference among members of the family was also a reason for changes in prahok production and consumption among people in group 1. People of different ages might prefer different kinds of foods. It was found that the young age group of members in the family of some respondents seemed less favorites in foods that contain prahok than elder persons. Thus, this change made them decide to produce less amount of prahok than before.

> *"Prahok consumption in my family decreased from one generation to another generation. I observed that my children do not like eating prahok much. Their favorite foods include fried pork with vegetables, vegetable soups, fried chicken, and so on."* (Female respondent, 37, home consumption group, seasonally flooded village, in-depth interviews, 2022)

Yet, some of them added that they would continue making prahok for home consumption if they had time or plenty of fish. This is because prahok is good food preservation and a special ingredient that cannot lack for Khmer foods in their families. Therefore, it can be seen that making prahok is quite an important part of people in group 1 for their cuisine in terms of food security and necessary ingredient for traditional foods.

6.2 Professional Prahok makers (group 2)

This section shows different perceptions or feelings among people in the professional group due to the changes in their prahok production, and reasons for changes in their prahok production and consumption. Additionally, this section also looks at their further perceptions of seeing prahok production after they changed it. The detailed discussions about this group are presented in the following sub-sections.

6.2.1 Emotions about the Changes

According to the results of the study, professional prahok makers (group 2) have continued to produce prahok for selling. However, the amount of producing prahok among the respondents in this group moderately decreased in comparison with the time that they used to do. Through in-depth interviews, this study revealed that this change made professional prahok makers feel concerned about their career and income contribution to their families. The majority responses from female respondents responded that processing prahok was meaningful to them as it was their professional career, and also the career that they used to do from generation to generation. It was a good job that they could earn income to support their family besides doing household chores, and prahok was also a significant ingredient for daily foods as well as good food preservation for their family. Moreover, some of them responded that producing prahok was the only skill that they could do as they were women and became older. Others responded that it was a better job to earn income for supporting their family because they were widowed women. Therefore, they felt concerned to lose a career from their

ancestors and household income if their prahok production continues decreasing like the current situation in the future. The below quotes illustrated the different perspectives of female respondents regarding these issues.

> *"If the amount of producing prahok continues decreasing, I feel worried to lose this job because I am a widowed woman and getting older. I don't know what to do anything if I am not able to make prahok. I don't have farmland, too. Anything happens; I continue to make prahok for selling."* (Female respondent, 50, professional group, seasonally flooded village, in-depth interviews, 2022)

> *"Processing prahok is really important for me and my family's income. It is my professional career. Prohok production was being made by parents. I continue to produce it after my parents passed away. Even though the current amount of producing prahok in my family decreased, I still make it for selling because of the career my parents and grandparents"* (Female respondents 60 & female respondents 68, professional group, seasonally flooded village, in-depth interviews, 2022)

> *"Prahok production is significant for me and my family in terms of food and income. It is only one skill that I can earn money to support my family. I continue processing prahok though there are some difficulties in making prahok at the current time and cannot produce a large amount of prahok as before."* (Female respondents, 64, professional group, displaced village, in-depth interviews, 2022)

According to this issue, this study also further examined the perspectives from male respondents that their wives were professional prahok makers. Based on the responses from male respondents, it was noticed that the engagement of women in prahok production was significant for their families. This is because the activity of women in involving in prahok production could contribute a large income to their family and food security and food safety for their family. They felt difficulty if women in their families did not engage in prahok production. Therefore, it indicates that the changes in prahok production not only made women as professional prahok makers feel concerned or distressed but also affected men's feelings in the families that their wives were professional prahok makers.

> A male respondent also pointed out that *"I think that the engagement of my wife in prahok production is really important for my family. It is a good job and a source of*

my family's income. It also can keep for long-term food consumption for my family. If my wife stops making prahok, my family may face difficulty as our livelihood mainly relies on prahok production. I feel regret if she decides to do so." (Male respondent, 35, seasonally flooded village & male respondent, 28, displaced village, professional group, in-depth interviews, 2022)

6.2.2 Reasons for Changes and Further Seeing Prahok Production

According to the study's findings, professional prahok makers currently still continued processing prahok for selling even though some parts of their prahok production pattern changed. Through in-depth interviews with them, there were two main reasons that made them change their prahok production. Decreasing in revenue from selling prahok was found as a reason that women in group 2 decided to produce less amount of prahok for selling than before. Currently, the number of prahok buyers decreased than before due to changes in consumers' preferences and market trends. In addition, the increasing price of inputs (fish and salt) also made them buy less fish for processing and selling. Thus, women as professional prahok could not earn much revenue from selling prahok like before.

Another observation from several women as professional prahok makers showed that gender stereotype in their family was found as a reason that they changed their prahok production. The case from one female respondent expressed that gender norm affected their life and skills. In Cambodian traditional culture among fisher households, fishing and earning income support family are considered as men's skills and responsibilities, while prahok processing and doing household work are considered as women's skills and responsibilities. Due to this issue, women tended to lose their skill in fishing which caused a matter for them in processing prahok and their life when men as their husbands were absent in their families. Becoming widowed women and limited knowledge, this situation caused many challenges for their life and children.

"*Since my husband passed away, I cannot make a large amount of prahok for selling. A big part of the fish for processing prahok that I used to produce depended on fish caught by my husband. Throughout generations, I and other women in my village often stayed home, selling, and processing fish. Most of us don't know how to fish. As my family's livelihood mainly relies on fishing and fish processing, I faced a big challenge in my life when my husband passed away. Now, I produce prahok*

depending on the money that I have for buying freshwater fish from my villagers to process prahok and sell." (Female respondent, 50, professional group, seasonally flooded village, in-depth interviews, 2022)

Even though there were some reasons that made them change prahok production, this study also found that women as professional prahok makers would continue processing prahok because it was their professional career/identity. It was also a career in which they could earn income to support their family. Several respondents added that they were willing to continue producing prahok because of its uniqueness. Prahok can keep for a long time without damage and it will get a better price if it has been kept for a long time. Others also responded that they would encourage their children to continue producing prahok because they want to protect traditional career from their ancestors.

6.3 Fresh fish/Semi-processed prahok Sellers (group 3)

This section shows different perceptions or feelings among people in the semi-processing group (group 3) due to the changes in their prahok production, and reasons for changes in their prahok production and consumption. Additionally, this section also looks at their further perceptions of seeing prahok production after they changed it. The detailed discussions about this group are presented in the following sub-sections.

6.3.1 Emotions about the Changes

Based on the result of the study, fresh fish/semi-processed prahok sellers are former professional prahok makers. Currently, they changed the purpose of making prahok from producing it for selling to only making it for consumption. They currently also switched from selling prahok to selling fresh fish or semi-processed prahok. Through in-depth interviews with the respondents in group 3, these changes made them feel losing their identity as prahok makers, a part of family income, and local culture. As they were former professional prahok makers and used to produce a large amount of prahok for selling, they felt unhappy and lost a part of their household's income when they just only produced prahok for home consumption. A case from female respondents in a seasonally flooded village expressed that they felt like losing their identity as prahok makers after switching from making prahok for selling to doing other jobs such as selling fresh fish/fish meat or semi-processed prahok, or even seasonal working as hired labor of cutting fish heads to earn income for their family.

> *"After switching from selling prahok to selling fresh fish, I feel unhappy and lost the career that I used to do. Since before, everyone in my village knows that I am a professional prahok maker. Now, I stop make it for selling, I feel that my identity as a prahok maker was gone. For me, it is hard to describe it."* (Female respondent, 60, fresh fish/semi-processing group, displaced village, in-depth interviews, 2022)

Another case from female respondents in the displaced village showed that they felt worried to lose the culture of making prahok in their area when many people in the village intended to produce and sell fresh fish/semi-processed prahok instead of making prahok for selling. The change in preference of middlemen and wholesalers (changes in market trends) was also a concerned factor that influenced on culture of processing prahok. If all these things continue to happen in the future, they thought that the culture of making prahok and local identity as processing prahok in their areas might not exist anymore. Therefore, it indicates that the change in the purpose of making prahok mattered for respondents in group 3 and made them feeling lose their career identity, lose a part of their household's income, and their local culture.

6.3.2 Reasons for Changes and Further Seeing Prahok Production

Through in-depth interviews with the respondents in group 3, this study found that there were four main reasons why people in this group decided to change the purpose and amount of making prahok including household's economic matter, household work burden, change in food culture, and business competition. The first, the household's economic matter was found as one among other significant reasons that made some prahok makers change their prahok production. To adapt to their daily livelihoods, they spent most of their time doing other alternative jobs instead of making prahok such as selling fresh fish, fish meat/semi-prahok, working as hired labor (lifting shells), cutting fish heads, owning grocery shops, raising chickens or vegetables. They currently produced less amount of prahok purpose of consumption only due to daily income constraints. As they had problems with the household's economy, they did not have enough money to make prahok and stocking as before. A large amount of fish was kept for selling and processing fish meat or semi-processed prahok for selling rather than kept for processing prahok. Particularly, a case from female respondents in the seasonally flooded village showed that they did not decrease the amount of fish for selling to keep it for making prahok for home consumption as they needed daily income, and also could not catch more fish like before. They would like to sell all fish

except tiny fish or spoiled fish that they could not sell. Then, all the remaining fish would be processed into prahok for home consumption.

> *"Due to livelihood adaptation, I stopped producing prahok for selling. Currently, I only sell fish to earn daily income. Making prahok happens when there is remaining or spoiled fish from selling and I just make it for only home consumption."* (Female respondent, 60, fresh fish/semi-processing group, seasonally flooded village, in-depth interviews, 2022)

The second, household work burden was found as a reason that made the respondents in group 3 switch purposes from selling prahok to selling fresh fish or semi-processed prahok. A case from a female respondent in the seasonally flooded village showed that the imbalance of time between household chores and the economic activity of women in the family caused a constraint for women in processing prahok. Unlike men, married women need to play good roles as a wife and a mother in the family rather than spending time for earning income. Within the time consuming of producing prahok and limited time for processing prahok, some women respondents in group 3 decided to make prahok for only home consumption instead of producing it for selling. Moreover, this issue made them chooses jobs that allow them to spend less time for working, and also easily get income.

> *"Nowadays, the main income source of my family comes from selling ice and selling fish or fish meat. Since I have a child, I am busy taking care of my son and doing household chores. Currently, I don't have enough time to make prahok for selling as before. Moreover, making prahok is also time-consuming."* (Female respondent, 26, fresh fish/semi-processing group, seasonally flooded village, in-depth interviews, 2022)

The third, change in food culture was also considered as another reason why they switched from processing and selling prahok to only making it for home consumption and selling fresh fish/semi-processed prahok. Based on the study's findings among the respondents in group 3, this study revealed that the modern lifestyle of people is closely linked to food. Nowadays, many types of foods emerged in the country through influential culture from neighboring countries and other European countries. This issue not only change food preferences among people in society but also developed many types of food ingredients for women as a housewife to choose. Moreover, it was observed that young mothers nowadays seemed less

preference for cooking foods containing prahok due to the heavy smell of prahok and their favorite foods. Furthermore, the demand for prahok from middlemen or wholesalers also moderately decreased due to the high demand for semi-processed prahok in the local areas. Thus, all of these matters reflect the change in food culture which caused a matter for women as prahok makers. The fourth, business competition was also a reason that made people in group 3 change their purpose of making prahok. Several respondents in group 3 expressed that they decided to sell fresh fish/semi-processed prahok because there were many prahok makers and prahok sellers (retailers and wholesalers) in their areas. As they faced difficulty with household income, they felt difficult to continue processing for selling.

On the other hand, the reasons for changes in prahok production also led to changes in the amount of prahok consumption in their family. For instance, a case from a female respondent in the seasonally flooded village expressed that their family frugally consume prahok after stopping making prahok. Before, her family often put a large amount of prahok into everyday foods (foods that need to cook with prahok) in the past time. This is because their family likes eating prahok. Now, she needs to put less amount of prahok into soups than before. Moreover, the study also found that some respondents in group 3 decided to buy extra prahok for their home consumption when they lacked prahok for consumption. They also added that they would prefer buying prahok from their villagers if they chose to buy it.

> *"During the time that my family could produce a large amount of prahok, we normally like to put a large amount of prahok into daily foods. My husband and I like the heavy smell of prahok in each type of food. Now, we put less amount of prahok than before as we cannot produce much amount of prahok."* (Female respondent, 26, fresh fish/semi-processing group, seasonally flooded village, in-depth interviews, 2022)

> *".....after relocating, my family faced many difficulties in living and processing prahok. Currently, we irregularly produce prahok. My family sometimes also buys prahok from people in the village for our daily consumption."* (Female respondent, 61 & female respondent 60, fresh fish/semi-processing group, displaced village, in-depth interviews, 2022)

Yet, the study also figured out that prahok production still played important roles for the respondents in group 3 in terms of food security and high preference for homemade prahok

even though they switched from selling prahok to selling fresh fish or semi-processed prahok. Particularly, some of them would produce prahok for selling again when there were available fish and time. An interesting case from one male respondent in the seasonally flooded village revealed that selling prahok could get better income than selling fresh fish. In addition, the rate of increasing or decreasing the price of prahok from time to time does not highly drop compared to the rate price of fish. Furthermore, prahok can keep for a long time without damage while fish is easy to spoil. Based on these reasons, the male respondent claimed that the engagement of a woman in prahok production was important for his family and strongly supports her wife to continue making prahok for selling in the future when his family has enough time and capacity to make it.

> *A male respondent responded that ".....when my family's income is better, I will support my wife to continue producing for selling, again. This is because the price of selling prahok can earn a better income than selling fresh fish. For example, if I sell 100 kg of fresh fish (around 3,000 riel/kg), I can get money only 300,000 riel. But if I take 100 Kg of fish to make prahok, I can get around 50 0r 60Kg of prahok. So if I sell prahok at the price of 15,000-20,000 riel/kg, I will gain income about 1,000,000 riel. Moreover, the price of prahok does not much change compared to the price of fish. Prahok also can keep for a long time while fish is easy to spoil."* (Male respondent, 33, fresh fish/semi-processing group, seasonally flooded village, in-depth interviews, 2022)

6.4 Quitting Prahok makers (group 4)

This section shows different perceptions or feelings among people in quitting group (group 4) due to the changes in their prahok production and reasons for changes in their prahok production and consumption. Additionally, this section also looks at their further perceptions of seeing prahok production after they changed it. The detailed discussions about this group are presented in the following sub-sections.

6.4.1 Emotions about the Changes

Based on the study's findings, quitting prahok makers are either former professional prahok makers or former home consumption prahok makers. Currently, they are no more producing prahok for any purposes. According to these changes, some of them expressed their

ungrateful feelings after stopping making prahok. There were some reasons why they felt so. Those who expressed ungrateful feelings, and felt that they lost income and career from their ancestor. Others sadly expressed that they lost potential income and food security. This is because a big part of their livelihood relied on prahok production. Indeed, making prahok was meaningful for their lives as marginalised women and fisher households. Thus, they did feel regret and faced obstacles to their living when they stopped producing prahok. The different perspectives of female respondents are presented below.

> *"Making prahok is my life. Having 500 kg of prahok looks like having 1 weight of gold. Making prahok is a very good career for every era when fish and capital are available. For instance, by selling 20 kg of prahok, I can get 250,000 riel to support my living for nearly 1 month. I started making prahok when I lived with my husband and children. If I have enough money, I will produce prahok again until my health becomes weak."* (Female respondent, 67, quit group, displaced village, in-depth interviews, 2022)

> *"I feel so sad after quitting prahok production. Prahok is very important for my family. It is good food security and is also the main income that I can earn to support my family. As I am a widowed woman and have limited education and skill, I do not what to do. I feel so difficult now."*(Female respondent, 48, quit group, seasonally flooded village, in-depth interviews, 2022)

On the other hand, the study also found that some female respondents did not show any distress feelings due to this change. This is because they were busy doing other jobs that could provide them with better income than producing prahok. Moreover, they felt that making prahok is take time and needed to have a space to store it, too.

> *"I do not feel much concern after quitting prahok production. Even though making prahok can help me earn money to support my family, I now can find another job that can have a better income to support my family. Thus, I don't have enough time to make prahok anymore. After relocating, it's also difficult to store it. I need to move it from one place to another place when rainy season is comming."* (Female respondent, 30, quit group, seasonally flooded village, in-depth interviews, 2022)

6.4.2 Reasons for Changes and Further Seeing Prahok Production

Based on the study's findings, there were some reasons that made people in group 4 decided to quit their prahok production including health issues, job alternatives, the changes in gender roles in the family, and a decrease in household members. Health issue was found as a reason that they chose to quit prahok production. As some prahok makers were getting old and sick, they decided to stop making prahok. They felt difficulty in processing prahok as the process of making is quite time-consuming. Indeed, they also lacked assistance from their family members in producing prahok.

> *"Before, I used to make prahok for selling and consumption. Currently, I stop making prahok because my health is not well (getting older and sick), and don't have children to help me. I live alone after my children are married."* (Female respondent, 67, quit group, seasonally flooded village, in-depth interviews, 2022)

Job alternatives were also found as the reason that some respondents in group 4 decided to stop producing prahok. Based on information from in-depth interviews, people decided to quit prahok production because they could find other jobs that could provide them with a better income and livelihood. Several respondents from the seasonally flooded village expressed that they used to make prahok for selling. At that time, prahok production provided them with quite good income to support their family and save. In addition, the profit that was earned from selling prahok and saved from time to time could help them to have the capital to start another career with a better income than before. They currently own small grocery stores while others work as prahok traders or rice traders.

Another finding, this study also revealed that the change in gender roles in the family was another reason that made some prahok makers decide to quit their prahok production. This reason was figured out among respondents in the displaced village. As people in this area were currently announced to relocate their livings, many people who used to go fishing and processing faced many difficulties with the current situation for both working and living. Due to this issue, the majority of responses from the respondents in the displaced village showed that men in their families currently irregularly went fishing while others switched from fishing to working as hired labor to earn income support their family, and adapt their livelihood. Even though men did not directly engage in prahok production, the absence of men in fishing activities also affected prahok production in their families. According to this

matter, a female respondent from the displaced village responded that a big part of the input (fish) for processing prahok was based on the amount of fish that their family could catch. If they did not go fishing and catch plenty of fish, she also did not have fish to make prahok. She continued to complain that it was difficult for her to continue processing prahok for selling. Within the current situation, daily income was needed. No matter how she had no choice besides quitting prahok production.

Furthermore, this study found that the decrease in household members was also considered as a reason that made some people in group 4 decided to stop producing prahok for home consumption. Based on the responses from the respondents in the displaced village, it was noticed that the number of members in their family decreased after relocating. This is because some members of their families migrated to work in the city and other foreign countries to earn income for supporting family. Based on the responses' side of respondents from the seasonally flooded village, it was revealed that the number of members in their family decreased due to some of their children getting married. Their children currently live separately from them. Due to fewer members in the family, the amount of prahok consumption in the household also reduced. Therefore, they decided to stop producing prahok for home consumption and chose to buy prahok from other villagers if they needed it.

> *"From my experiences in cooking foods, the amount of consuming prahok in my family slightly decreased compared to the previous time due to the decrease in members in my family. Before, my family had 9 people, and we consumed prahok around 6kg to 7kg per year. Now, my family has only 5 people, so we consume prahok only 4kg or 5kg per year."* (Female respondent, 48, quit group, seasonally flooded village, in-depth interviews, 2022)

On the other hand, limited foods expense was also found as one of the other reasons that caused changes in prahok consumption among the households of respondents in group 4. As some of them faced difficulties in earning income and living conditions, they decided to buy less amount of prahok for home consumption. They thought that it could help them to reduce some parts of food expenses in the families. It was also one way to maintain their livelihoods as they currently could not earn much income.

> "*When I live on the water and make prahok for selling, my family used to consume prahok approximately amount which was 5kg to 7kg per year. After relocation, I*

stopped producing prahok, so now my family only buys around 2kg or 3kg of prahok for home consumption per year. By doing so, I can save some money to buy other foods for my family." (Female respondent, 54, quit group, displaced village, in-depth interviews, 2022)

Even though they gave up prahok production, this study found that producing prahok is still meaningful for them regarding career identity, income generation, food security, or local food identity. Some people responded that they would start producing prahok again if they had enough ability to make it. This is because they don't want to lose their identity as a prahok maker or economic role in their family. In addition, they also want to preserve food heritage. Meanwhile, other respondents responded that they would make prahok again if they had time and were available for fish. At least, making prahok for home consumption could help them reduce their family food expense. For instance, a case from a female respondent showed that she currently faced difficulties in earning income to support her living after being displaced. Within the current situation, they could buy less amount of prahok for home consumption. By doing so, it could help her to reduce some parts of food expenses in the families and save money for other necessities demands. Additionally, it was also one way to maintain her livelihood as her family currently could not earn much income.

"After I stopped making prahok, I buy less amount of prahok for home consumption to reduce family food expenses and save money for other necessary expenses in my family. We don't have money to buy a large amount of prahok as we faced many difficulties in living after being displaced." (Female respondent, 48, quit group, seasonally flooded village, in-depth interviews, 2022)

6.5 Summary and Reflection the Reasons for Changes among Various groups

Table 6.1 illustrated the significant reasons for changes among different groups of prahok production. Through the above discussion about the reasons for changes in production and consumption patterns in each group, it can be seen that different groups of prahok production had different reasons for changes in patterns in their prahok production and consumption. Based on these findings, this study supposed that women who had abilities for working with other jobs might be less engaged in prahok production. Particularly, this situation emerged among people in the home consumption group (group 1). As they were busy with other income generations, they did not have much time to engage in prahok production. Moreover,

they just made prahok when they were available or plenty of fish. It means that they did not see prahok production as an important part of income contribution to their family, but they saw it as food security or a kind of waste fish management activity in their family. In addition, the changes in gender roles also slightly affected the engagement of women in prahok production. However, it did not cause any matters for women because it was just a complementary job.

Based on the reasons for changes among people in group 2, this study also supposed that women who mainly relied on prahok production as their primary occupation or main source of family income might like to continue processing prahok even though there were some changes in their prahok production. These women were often seen as professional prahok makers. Prahok production has wide meanings for women in this group. Prahok production is the only skill or career that they can do to earn income. It also reflects their identity as professional women in processing prahok. Indeed, it is a career from their ancestor. Thus, they desired to continue making prahok because they do not want to lose it. However, gender stereotypes highly affected the engagement of professional women in prahok production. This issue shaped the ability of women as professional makers in processing prahok which led them to feel distressed and concerned to lose their career identity.

On the other hand, this study realised that those women as professional prahok makers switched from making prahok for selling to only making prahok for home consumption because prahok production is no more maintaining their livelihoods (no more good source of income for their family). This situation often emerged among women in group 3. It also noticed that gender roles (household work burden for women) are a main issue and highly affected women in this group to continue processing prahok, especially making prahok for selling. That's why they switched their purposes and amount of producing prahok. However, they still saw prahok production as an important part of their family in terms of food security and their identity as prahok makers. Therefore, they currently continue producing prahok for home consumption even though they are not able to make prahok for selling anymore.

Based on the results of the study among people in group 4, this study recognised that women no longer have good health and assistance from their family members might like to quit prahok production neither selling nor home consumption purposes. For those who could find other better jobs (good income generation for their family) than processing prahok, they might like to quit prahok production rather than continue to make and sell it. Change in

gender roles is also a key constraint and highly affected women in this group to continue processing prahok. Indeed, this issue made them decides to quit their prahok production which caused women to lose their identity as prahok makers. Even though they gave up prahok production, it seems that making prahok is still meaningful for some of them regarding career identity, income generation, food security, or local food identity.

Table 6.1 Summary Reasons for Changes among Various Groups

Criteria	Different groups of prahok production			
	Home consumption prahok makers (G1)	Professional prahok makers (G2)	Fresh fish/Semi-processed prahok sellers (G3)	Quitting prahok makers (G4)
Reasons for changes in prahok production and consumption	-Lack of time -Change in food preference	- Decreasing in revenue from selling prahok - Gender stereotype (Unable to learn fishing skill as men)	-Household's economic matter - Household work burden -Change in food culture -Business competition - Decreasing amount of producing prahok	- Health issue - Job alternatives - Changes in gender roles in the family - Decrease in household members - Limited foods expense

Source: In-depth interviews, 2022

6.6 Chapter Summary

This chapter illustrates and explains reasons for changes in prahok production and consumption patterns among various groups of prahok makers. In addition, this chapter also illustrates how people from different groups of prahok production feel about the changes in their prahok production and consumption, and further deeply understands how they see their prahok production when they changed it. This study found that people from different groups of prahok production expressed different feelings due to the changes in their prahok production. It was noticed that people from the home consumption group (group 1) did not express any concern feelings due to the effect of changes in their prahok production. This is because making prahok is just their secondary job or waste fish management activity. They did it when they were free of work or when there was plenty of fish. There were two main reasons for changes in prahok production among people in group 1 including lack of time and

change in food preferences among members of the family. Even though people in the home consumption group decided to reduce the amount of producing prahok, they have continued making prahok for home consumption when they have time and have plenty of fish. This is because homemade prahok is quite significant for their family in terms of safe food to eat, a special ingredient for Khmer traditional foods, and food security for their family.

By contrast, the changes in prahok production made the professional group (group 2) feel concerned to lose their professional career, worry about lose ancestors' careers, and economic role in their family (income contribution to the family). This is because processing prahok is meaningful to them as it is their professional career. Moreover, it is also a career that they used to do from generation to generation. Furthermore, producing prahok is only one skill that marginalised women could do to earn income to support their living, particularly widowed women. There were two main reasons that made people in the professional group reduce the amount of producing prahok in their households including decreasing in revenue from selling prahok and gender stereotypes in their families. Gender stereotypes affected women's life and limited their skills in fishing which caused a matter for them in processing prahok when there were no men in their families. On the other hand, this study also found that women in the professional group still see prahok as an important part of their life, and they are willing to continue processing prahok even though they changed the amount of producing prahok in their family. Particularly, some of them expressed that they will encourage their children to continue producing prahok because they want to protect traditional careers from their ancestors.

Among fresh fish/semi-processed prahok sellers (group 3), this study found that the changes in their prahok production made them feel losing their identity as prahok makers, losing a part of their family income, and local culture. Because they were former professional prahok makers and used to produce a large amount of prahok for selling, they felt unhappy and lost a part of the household's income when they just only produced prahok for home consumption. Based on the study's findings, there were five main reasons why people in this group decided to change the purpose and amount of making prahok including household's economic matter, household work burden, change in food culture, decreasing amount of producing prahok, and business competition. Even though they changed their prahok production, this study figured out that they still see prahok production as an important activity in their family in terms of

food security and still give high value to homemade prahok. If they choose to buy prahok, they would prefer buying prahok from their villagers rather than from the market.

Another investigation among people in quitting group (group 4), this study found that some of them expressed their ungrateful feelings after stopping making prahok while others did not show any distress feelings due to this change. Those who expressed ungrateful feelings, and felt that they lost income and career from their ancestor. Others sadly expressed that they lost potential income and food security. This is because a big part of their livelihood relied on prahok production. Indeed, making prahok is meaningful for their lives as marginalized women and fisher households. From the side of those who did not feel concerned due to this change, the result of the study revealed that they were busy with doing other jobs which had better income than producing prahok. There were some reasons that made people in group 4 decided to quit their prahok production including health issues, job alternatives, changes in gender roles in the family, a decrease in household members, and limited foods expense.

After quitting prahok production, the majority of them thought that prahok was still meant for them in various ways such as career identity, income generation, food security, or local food identity. According to the attached meanings, some of them expressed that they would start producing prahok again if they had enough ability to make it. This is because they don't want to lose their identity as a prahok maker or economic role in their family. In addition, others showed that they also want to preserve food heritage. Meanwhile, other respondents responded that they would make prahok again for home consumption if they had time and available fish.

CHAPTER 7
CONCLUSION AND RECOMMENDATIONS

7.1 Conclusion

This study aims to understand the changes in patterns in prahok production and consumption, identify affecting factors, and explore the reasons for changes in prahok production and consumption patterns among women as prahok makers in Tonle Sap Lake. The study revealed that the current prahok production and consumption patterns of prahok makers in Tonle Sap Lake changed due to some influential factors including livelihood strategies; increasing price of inputs; change in consumers' preference; decrease in the amount of fish caught; change in market trend; time-saving and the easiest of selling fresh fish or semi-processed prahok; lack of capital; time-consuming of producing prahok; and change in living patterns. The effects of these factors also made prahok makers into different groups of prahok production. In particular, this study found that there were four groups of prahok makers due to the effects of those factors which are named: Home consumption Prahok makers (group 1); Professional prahok makers (group 2); Fresh fish/Semi-processed prahok sellers (group 3); and Quitting prahok makers (group 4). However, the different groups of prahok production had different affecting factors, and those influential factors also led to changes in their prahok production and consumption patterns in various ways.

This study showed that the prahok production of Home consumption Prahok makers (group 1) was affected by livelihood strategies. The effects of this factor led to a change in the amount of producing prahok (slightly decreased amount of producing) and changes in women's and men's roles in their families. However, this study also observed that this factor did not make them change their purpose of making prahok and the types of prahok for producing. Due to the decrease in the amount of producing prahok in their families, there was a change in the amount of prahok consumed in each household. They currently consumed less amount of prahok than before by slightly putting less amount of prahok into foods.

Regarding Professional prahok makers (group 2), their prahok productions were affected by two main factors including the increasing price of inputs and change in consumers' preferences. The effects of these factors caused to change in the amount of their producing prahok (moderately decreased amount of producing) and a decrease in income generation from prahok. This study also observed that these affecting factors did not find any changes

with regards to their purpose of making prahok, the type of prahok for producing, and gender roles in their family. In addition, there were no changes in prahok consumption patterns among them even though their prahok production changed. Currently, the amount of prahok consumption in their households remains stable.

With regards to Fresh fish/Semi-processed prahok sellers (group 3), their prahok production was affected by three main factors including a decrease in the amount of fish caught, change in the market trend, time-saving, and the easiest of selling fresh fish or semi-processed prahok. The effects of these factors caused to change in their purpose of making prahok (switching from producing prahok for selling to only making it for home consumption), types of prahok for producing (from Prahok Sach and Prahok Choeng to only producing Prahok Sach), highly decreased amount of producing, change in production scale (from small to micro scale production), change in gender roles, no more income from prahok production, and increasing expense for foods. Due to the changes in prahok production patterns, the amount of prahok consumption in their family also decreased. Currently, some of them frugally consumed prahok while others bought prahok from other villagers.

Relating to Quitting prahok makers (group 4), their prahok productions were affected by some factors including lack of capital, time consuming of producing prahok, and change in living patterns. The effects of these factors caused them to stop producing prahok for any purpose. Due to the changes in their prahok production patterns, there were some changes in their prahok consumption patterns. They currently bought prahok from other for home consumption and consumed either Prahok Sach or Prahok Choeng depending on their HH's income. Indeed, some of them frugally consumed prahok and reduced cooking foods containing prahok.

Based on the changes in patterns in prahok production and consumption among these four groups, this study also revealed that some reasons made them change their prahok production and consumption including lack of time, change in food preference, decrease in revenue from selling prahok, gender stereotype (unable to learn the fishing skill as men), household's economic matters, household work burden, change in food culture, business competition, decreasing amount of producing prahok, health issues, job alternatives, changes in gender roles in the family, decrease in household members, and limited foods expenses. However, different groups of prahok production had different reasons for changes in patterns in their prahok production and consumption.

The results of different reasons for changes indicate that women who had abilities for working with other jobs might less engage in prahok production. As they were busy with other income generations, they spent less time in engage in prahok production. It means that they did not see prahok production as an important part of income contribution to their family, but they saw it as food security or a kind of waste fish management activity in their family. In addition, the changes in gender roles also slightly affected the engagement of women in prahok production. However, it did not cause any matters for women because it was just a complementary job.

Conversely, those women who mainly relied on prahok production as their primary occupation or main source of family income might like to continue processing prahok even though there were some changes in their prahok production. Prahok production has wide meanings for women in this group. Prahok production is the only skill or career that they can do to earn income. It also reflects their identity as professional women in processing prahok. Indeed, it is a career from their ancestor. However, gender stereotypes shaped the abilities of women as professional makers in processing prahok which made them feel distressed and concerned about losing their career identity.

Remarkably, women who were no longer relying on prahok production as their primary occupation or main source of family income might like to switch from running prahok production to doing other jobs instead to adapt to their livelihoods. The changes in gender roles (household work burden for women) are problematic for women in this group to continue processing prahok, especially making prahok for selling. Yet, they still saw prahok production as an important part of their family in terms of food security and their identity as prahok makers. Therefore, they currently continue producing prahok for home consumption even though they cannot make prahok for selling anymore. This study also supposed that women were no longer in good health and assistance from their family members or those who could find other better jobs (good income generation for their family) than processing prahok, they might like to quit prahok production rather than continue to make prahok for home consumption or selling. The changes in gender roles and identity are problematic for their prahok production. Even though they gave up prahok production, some of them still saw prahok production as an important part of their life and locality such as career identity, income generation, food security, or local food identity.

Besides, this study also highlighted some findings related to gender roles, responsibilities, and decisions making in prahok production and consumption in the household of prahok makers. In terms of prahok production, this study revealed that gender division of labor and gender stereotypes between women and men in prahok productions have still emerged. However, women as prahok makers in the study areas (from every groups of prahok production) could make decisions for prahok production by themselves. Relating to gender roles in food preparation and decisions making in prahok consumption, the result of this study showed that women are affected by gender norms in which most of the tasks in food preparation were women's responsibilities. Yet, this study also noticed that women could make the decision on food preparation and prahok consumption in the household by themselves.

On the other hand, this study's findings also confirmed and contradicted the literature reviews in various ways. The study by De Silva (2011) revealed that Cambodian prahok makers often faced some difficulties in their prahok production including the high price of salt, the increasing price of fresh fish, technical problems, and the low price of prahok. However, that study did not illustrate how those factors could lead to changes in prahok production and consumption patterns among prahok processors. Based on the results of this study, this study also confirmed that increasing the price of fresh fish and salt was the factors that caused matters for prahok makers in processing prahok. In addition, this study also found that livelihood strategies; change in consumers' preference; decrease in the amount of fish caught; change in market trend; time-saving and the easiest of selling fresh fish or semi-processed prahok; lack of capital; time consuming of producing prahok; and change in living patterns were also other key affecting factors in prahok production among prahok makers which led to changes in patterns of their production and consumption. Furthermore, these factors not only affected prahok production among prahok makers but also made them into different groups of prahok production. Yet, this study did not find that technical problems and the low price of prahok were problematic for prahok makers. Even though the price of selling prahok at the farm gate was a bit lower than the price of selling prahok in the market, this study did not find it as a matter for prahok makers to change their production.

Even though women play vital roles in (fermented) fish processing, many studies figured out and discussed gender issues that often emerged in the fish processing process across countries. Having said that cultural beliefs can also influence societal gender roles and

stereotypes regarding occupations appropriate for women (Shinnar et al., 2012). In the context of Cambodia, traditional gender roles in Khmer society are also a key challenge for women in participating in fish processing (Nam & Bunthang, 2011). Furthermore, the gender division of labor also indicates that women are supposed to have good knowledge and skills in fish post-harvest activities while men are supposed to participate in fishing, transport, or tasks that require particular physical strength, or support women in their work rather than doing tasks in process knowledge (UNIDO & FIA, 2021). Thus, complementarity is a benefit for businesses, but women enterprises may be disadvantaged because they lack manpower and mobility. Through all information from these literature reviews, it can be seen that those studies illustrated and explained the issues between women and men in fish processing. However, those studies did not discuss gender issues among women from different groups of prahok production.

Based on the study's findings, this study also revealed that gender norms and perspectives affect women's and men's processing tasks in various ways. Additionally, it generates a large burden for women in terms of imbalance between productive and reproductive work. These constraints caused women from different groups of prahok production to change their prahok production and consumption patterns in different ways. Besides, this study also revealed that there were other reasons for changes in prahok production and consumption patterns among various groups of prahok makers such as household economic matters, changes in food preference change in food culture, business competition, health issues, job alternatives,...etc. Furthermore, this study observed that women who had better knowledge and skills in doing other jobs instead of producing prahok might like to less engage in prahok production or quit it. Therefore, this study concluded that different groups of women as prahok makers experienced changes in prahok production and consumption patterns in different ways and had different perceptions for these changes in various ways.

7.2 Recommendations

Throughout the results and discussions of this study, there are several recommendations that could be considered, addressed, and further focus on to improve prahok production and women's constraints (in either prahok production or household) among various groups of prahok makers which might impact in various ways. These recommendations are drawn up for the government and local authorities, and further research for researchers.

7.2.1 Government and Local Authorities Recommendations

The recommendations for local authorities are described as following:

- As fermented fish paste (Prahok) productions are mostly dominated by women and played vital roles for Cambodian women in terms of job opportunities, a part of family income, and food preservation and security for the families. Moreover, Prahok is closely linked with the identity of Cambodian respecting Khmer traditional foods and culture. Therefore, it would be good if the government and local authorities can consider creating official or standard prahok processing cooperatives or prahok processing factories in the areas that have the potential for freshwater fish and numerous fish processors. By doing so, it not only helps to promote local products (prahok product), but also protect the career identity of women as prahok makers, create numerous jobs for local people, and improve the country's economic growth.

- Despite the fact that the government and local authorities have organized and provided land, a better road system, markets,...etc for relocated residents. Yet, it has not been adequate. Therefore, the government and local authorities should continue to pay much attention to the living and necessities demands of people who relocated their living, especially the supply of clean water. Indeed, the government and local authorities should develop a better economic structure for relocated residents to new places of their living, especially fish processors, fishers, and those vulnerable people who lost their job opportunities and faced many difficulties to adapt with their current livelihoods.

- Based on the study's findings, illegal cutting down of forests and illegal fishing in Tonle Sap lake have still happened and remained key challenges for fishers in either fishing or fish processing activities, and also threaten inland fish resources in Cambodia. Thus, the government and local authorities should have further austerity measures to improve this situation.

7.2.2 Further Research Recommendations

According to the findings of this study, there are some recommendations that should be further considered to study or research in the future as following:

- The study related to identification of prahok products in Cambodia should be interest for the researchers in the future.
- Gender analysis in fermented fish paste (prahok) value chain.
- The study about standard quality of prahok and the ways to identify its quality
- The study relates to prahok processors at medium scale and large scale.

REFERENCES

Adesulu, A. T., & Awojobi, K. O. (2014). *Enhancing sustainable development through indigenous fermented food products in Nigeria*. 6.

Aldin-Lundgren, E., Troell, M., & Nam, S. (2008). *Role of low value fish for consumption and possible interactions/conflicts with the aquaculture in Cambodia*.

Allen, P., & Sachs, C. (2007). Women and food chains: The gendered politics of food. *International Journal of Sociology of Agriculture and Food*, *15*(1), 1–23.

Alonso-Población, E., & Siar, S. V. (2018). Women's participation and leadership in fisherfolk organizations and collective action in fisheries: A review of evidence on enablers, drivers and barriers. *FAO Fisheries and Aquaculture Circular (FAO) Eng No. 1159*. http://www.fao.org/3/i8480en/I8480EN.pdf

Bartkiene, E., Steibliene, V., Adomaitiene, V., Juodeikiene, G., Cernauskas, D., Lele, V., Klupsaite, D., Zadeike, D., Jarutiene, L., & Guiné, R. P. (2019). Factors Affecting Consumer Food Preferences: Food Taste and Depression-Based Evoked Emotional Expressions with the Use of Face Reading Technology. *BioMed Research Interantional*.

Belton, B., Johnson, D. S., Thrift, E., Olsen, J., Hossain, M. A. R., & Thilsted, S. H. (2022). Dried fish at the intersection of food science, economy, and culture: A global survey. *Fish and Fisheries*, *23*(4), 941–962. https://doi.org/10.1111/faf.12664

Bond, N. (2015). *Examining Adaptations to Changing Fish Populations of Tonlé Sap Lake in Cambodia:* [Doctoral dissertation]. The University of Guelph.

Briones Alonso, E., Cockx, L., & Swinnen, J. (2018). Culture and food security. *Global Food Security*, *17*, 113–127. https://doi.org/10.1016/j.gfs.2018.02.002

Brug, J., Tak, N. I., Te Velde, S. J., Bere, E., & De Bourdeaudhuij, I. (2008). Taste preferences, liking and other factors related to fruit and vegetable intakes among

schoolchildren: Results from observational studies. *British Journal of Nutrition*, *99*(S1), S7–S14.

Cairns, K., Johnston, J., & Baumann, S. (2010). Caring About Food: Doing Gender in the Foodie Kitchen. *Gender & Society*, *24*(5), 591–615. https://doi.org/10.1177/0891243210383419

Casini, L., Contini, C., Romano, C., & Scozzafava, G. (2015). Trends in food consumptions: What is happening to generation X? *British Food Journal*.

Chasserio, S., Pailot, P., & Poroli Corinne. (2014). When Entrepreneurial Identity Meets Multiple Social Identities: Interplays and Identity Work of Women Entrepreneurs. *International Journal of Entrepreneurial Behaviour and Research*, *20*(2), 128–154. https://doi.org/10.1108/IJEBR-11-2011-0157

Cole, S. M., McDougall, C., Kaminski, A. M., Kefi, A. S., Chilala, A., & Chisule, G. (2018). Postharvest fish losses and unequal gender relations: Drivers of the social-ecological trap in the Barotse Floodplain fishery, Zambia. *Ecology and Society*, *23*(2), 18. https://doi.org/10.5751/ES-09950-230218

De Silva, D. A. M. (2011). *Faces of women in global fishery value chains: Female involvement, impact and importance in the fisheries of developed and developing countries*.

Diei-Ouadi, Y., Sodoke Komivi, B., Ouedraogo, Y., Adjoa Oduro, F., Bokobosso, K., & Rosenthal, I. (2015). Strengthening the performance of post-harvest systems and regional trade in small-scale fisheries: Case study of post-harvest loss reduction in the Volta Basin riparian countries. *FAO Fisheries and Aquaculture Circular (FAO) Eng No. 1105*.

Essuman, K. M. (1992). *Fermented fish in Africa: A study on processing, marketing, and consumption*. Food & Agriculture Org.

Fiala, J., Bienertová-Vašk\uu, J., Brazdova, Z. D., Švancara, J., & Kukla, L. (2015). Gender differences in the projection of food preferences into food consumption in Czech adolescents. *Journal of Food & Nutrition Research*, *54*(3).

Grace, D., Roesel, K., Kanggethe, E., Bonfoh, B., & Theis, S. (2015). Gender Roles and Food Safety in 20 Informal Livestock and Fish Value Chains. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.2741313

Hasan, M. N., Sultan, M. Z., & Mar-E-Um, M. (2014). Significance of fermented food in nutrition and food science. *Journal of Scientific Research*, *6*(2), 373–386.

Hawkes, C. (2006). Uneven dietary development: Linking the policies and processes of globalization with the nutrition transition, obesity and diet-related chronic diseases. *Globalization and Health*, *2*(1), 1–18.

Iglesias-Gutiérrez, E., García-Rovés, P. M., García, Á., & Patterson, Á. M. (2008). Food preferences do not influence adolescent high-level athletes' dietary intake. *Appetite*, *50*(2–3), 536–543.

Kamsan, N. (2019). *Country Fisheries Trade: Cambodia – SEAFDEC*. http://www.seafdec.org/country-trade-cambodia/

Kearney, J. (2010). Food consumption trends and drivers. *Phil. Trans. R. Soc. B*, *365*, 2793–2807.

Kim, J. H., Lee, M. J., & Yoon, I. K. (2007). Value recognition and eating patterns of Kimchi in female middle school students and their mothers. *Nutrition Research and Practice*, *1*(2), 150–157.

Kusakabe, K. (2014). Women Fish Processors in Cambodia: Challenges for Collective Business. *Gender in Aquaculture and Fisheries: The Long Journey to Equality*, 93.

Kusakabe, K., & Sereyvath, P. (2014). Women Fish Border Traders in Cambodia: What Shapes Women's Business Trajectories? *Gender in Aquaculture and Fisheries: Navigating Change, Asian Fisheries Science Special Issue 27S*, 43–57.

Lamberts, D. (2006). The Tonle Sap Lake as a Productive Ecosystem. *International Journal of Water Resources Development*, *22*(3), 481–495. https://doi.org/10.1080/07900620500482592

Lazaridis, P., & Drichoutis, A. C. (2005). Food consumption issues in the 21st century. *The Food Industry in Europe*, 21–33.

Lee, C. H., & Kim, M. L. (2016). History of Fermented Foods in Northeast Asia. In J. P. Tamang (Ed.), *Ethnic Fermented Foods and Alcoholic Beverages of Asia* (pp. 1–16). Springer India. https://doi.org/10.1007/978-81-322-2800-4_1

Lee, J. O., & Kim, J. Y. (2013). Development of Cultural Context Indicator of Fermented Food. *International Journal of Bio-Science and Bio-Technology*, *5*(4), 8.

LeGrand, K., Borarin, B., & Young, G. M. (2020). Tradition and Fermentation Science of prohok, an ethnic fermented fish product of Cambodia. *Journal of Ethnic Foods*, *7*(1), 12. https://doi.org/10.1186/s42779-019-0027-1

Lwenya, C. A., & Abila, R. (2019). *The Gender Role in Fish Processing and Trading Practices in Lake Victoria (Kenya)*. https://aquadocs.org/handle/1834/7193

Manyungwa, C. L., Hara, M. M., & Chimatiro, S. K. (2019). Women's engagement in and outcomes from small-scale fisheries value chains in Malawi: Effects of social relations. *Maritime Studies*, *18*(3), 275–285. https://doi.org/10.1007/s40152-019-00156-z

Materia, V. C., Linnemann, A. R., Smid, E. J., & Schoustra, S. E. (2021). Contribution of traditional fermented foods to food systems transformation: Value addition and

inclusive entrepreneurship. *Food Security*, *13*(5), 1163–1177. https://doi.org/10.1007/s12571-021-01185-5

Mazonde, N. B. (2016). *Culture and the self-identity of women entrepreneurs in a developing country* [PhD Thesis]. University of the Witwatersrand, Faculty of Commerce, Law and Management , Graduate School of Business Administration.

Monterrosa, E. C., Frongillo, E. A., Drewnowski, A., de Pee, S., & Vandevijvere, S. (2020). Sociocultural Influences on Food Choices and Implications for Sustainable Healthy Diets. *Food and Nutrition Bulletin*, *41*(2_suppl), 59S-73S. https://doi.org/10.1177/0379572120975874

Mousset, E., Rogers, V., Saray, S., Ouch, K., Mith, Samonn, & Baran, Eric. (2016). *Roles and value of fish in rural welfare in Cambodia (welfare data analysis)*. Inland Fisheries Research and Development Institute, Cambodia.

Nam, S., & Bunthang, T. (2011). Fisheries resources in Cambodia: Implications for food security, human nutrition and conservation. *International Conference on Asian Food Security*, 1–10.

Nam, S., Chakriya, N., Vann, L. S., & Robert, P. (2009). *Maximizing the utilization of low value or small size fish for human consumption through appropriate value added product development*. EPP-A-00-06-00012-00. Inland Fisheries Research and Development Institute, Phnom Penh, Cambodia and University of Connecticut, USA.

Narzary, Y., Das, S., Goyal, A. K., Lam, S. S., Sarma, H., & Sharma, D. (2021). Fermented fish products in South and Southeast Asian cuisine: Indigenous technology processes, nutrient composition, and cultural significance. *Journal of Ethnic Foods*, *8*(1), 1–19.

Norng, C., Chay, C., So, N., & Chau, K. (2011). Small-Sized Fish Paste (Prahoc) Processing in Cambodia. *International Journal of Environmental and Rural Development*, *2*, 36–41.

Nuorteva, P., Keskinen, M., & Varis, O. (2010). Water, livelihoods and climate change adaptation in the Tonle Sap Lake area, Cambodia: Learning from the past to understand the future. *Journal of Water and Climate Change*, *1*(1), 87–101. https://doi.org/10.2166/wcc.2010.010

Ockerman, H. W., & Basu, L. (2014). Production and consumption of fermented meat products. *Handbook of Fermented Meat and Poultry*, 7–11.

Okorley, E. L., Zinnah, M. M., Menash, A. O., & Owens, M. (2004). *Women in agro-processing in Ghana: A case study of the state of women in small scale fish smoking in the central region of Ghana*.

Oyewole, O. A., & Isah, P. (2012). *Locally fermented foods in nigeria and their significance to national economy: A review*. *1*(4), 92–102.

Pérez-Rodrigo, C., Ribas, L., Serra-Majem, L. L., & Aranceta, J. (2003). Food preferences of Spanish children and young people: The enKid study. *European Journal of Clinical Nutrition*, *57*(1), S45–S48.

Quisumbing, A. R., Rubin, D., Manfre, C., Waithanji, E., Van den Bold, M., Olney, D., Johnson, N., & Meinzen-Dick, R. (2015). Gender, assets, and market-oriented agriculture: Learning from high-value crop and livestock projects in Africa and Asia. *Agriculture and Human Values*, *32*(4), 705–725. https://doi.org/10.1007/s10460-015-9587-x

Rabbanee, F. K., Yasmin, S., & Haque, A. (2012). Women involvement in dry fish value chain approaches towards sustainable livelihood. *Australian Journal of Business Management and Research*, *1*(12), 42–58.

Rao, S. (2014). Nurturing entrepreneurial women: Insights from a developing country. *Journal of Entrepreneurship in Emerging Economies*, *6*(3), 268–297. https://doi.org/10.1108/JEEE-04-2014-0014

Ratha, C., Sokheang, U., Socheat, C., & Ratha, S. (2021). *Technical report on market survey of fish and fishery products of Cambodia in Battambang and Siem Reap cities*. https://doi.org/10.13140/RG.2.2.16468.73605

Rawat, K., Kumari, A., Kumar, S., Kumar, R., & Gehlot, R. (2018). Traditional Fermented Products of India. *International Journal of Current Microbiology and Applied Sciences, 7*(04), 1873–1883. https://doi.org/10.20546/ijcmas.2018.704.214

Ray, M., Ghosh, K., Singh, S., & Mondal, K. C. (2016). Folk to functional: An explorative overview of rice-based fermented foods and beverages in India. *Journal of Ethnic Foods*, *3*(1), 5–18.

Ray, R. C., & Joshi, V. K. (2014). Fermented Foods: Past, Present and Future. In *Microorganisms and Fermentation of Traditional Foods* (pp. 1–36). https://doi.org/10.13140/2.1.1849.8241

Richardson, R. B., & Suvedi, M. (2018). Assessing the Potential for Small-Scale Aquaculture in Cambodia. *Environments*, *5*(7), Article 7. https://doi.org/10.3390/environments5070076

Rossman, G. B., & Rallis, S. F. (2016a). *An Introduction to Qualitative Research: Learning in the Field*. SAGE Publications.

Rossman, G. B., & Rallis, S. F. (2016b). *An Introduction to Qualitative Research: Learning in the Field*. SAGE Publications.

Sarath, S. (2020, December 23). *High costs and low fish catch imperil 'prahok' production. CamboJA News*. https://cambojanews.com/high-costs-and-low-fish-catch-imperil-prahok-production/

Seng, R. (2017). *Livelihoods in the changing Tonle Sap: Past, present and future* [PhD Thesis]. Université Paul Sabatier-Toulouse III.

Shariff, S., Mohd Zahari, M. S., Norazmir, M., & Muhammad, R. (2013). How Could the Transfer of Food Knowledge be Passed Down? *Procedia - Social and Behavioral Sciences*, *105*, 429–437. https://doi.org/10.1016/j.sbspro.2013.11.045

Shinnar, R., Giacomin, O., & Janssen, F. (2012). Entrepreneurial perceptions and intentions: The role of gender and culture. *Entrepreneurship Theory and Practice*, *36*, 465–493. https://doi.org/10.1111/j.1540-6520.2012.00509.x

Shortall, S. (2014). Farming, identity and well-being: Managing changing gender roles within Western European farm families. *Anthropological Notebooks*, *20*(3), 67–81.

Siason, I., Tech, E., Matics, K. I., Choo, P. S., Shariff, M., Heruwati, E. S., Susilowati, T., Miki, N., Shelly, A. B., Rajabharshi, K. G., Ranjit, R., Siriwardena, P.P.G.N., Nandeesha, M.C., & Sunderarajan, M. (2002). *Women in fisheries in Asia*.

Sibal, V. (2018). Food: Identity of culture and religion. *Scholarly Research Journal for Interdisciplinary Studies*, *6*(46), 10908–10915.

Siddhnath, Ranjan, A., Mohanty, B. P., Saklani, P., Dora, K. C., & Chowdhury, S. (2022). Dry fish and its contribution towards food and nutritional security. *Food Reviews International*, *38*(4), 508–536.

Smid, E. J., & Hugenholtz, J. (2010). Functional genomics for food fermentation processes. *Annual Review of Food Science and Technology*, *1*, 497–519.

Sokhorng, C. (2016, March 18). CAMBODIA: Taking the Fishiness Out of A Favourite Food. *Reporting ASEAN - Voices and Views from within Southeast Asia*. https://www.reportingasean.net/taking-the-fishiness-out-of-cambodias-favourite-food/

Sophea, U., Pomeroy, R. S., Nam, S., & Chhay, K. (2010). Market Channel and Trade of Fermented Small-Sized Fish Paste in Cambodia. *International Journal of Environmental and Rural Development*, *1*(1), 145–151.

Surya, R., & Lee, A. G.-Y. (2022). Exploring the philosophical values of kimchi and kimjang culture. *Journal of Ethnic Foods, 9*(11), 1–14.

Tang, L. (2017). Cultural changes and food production. *International Journal of Business and Social Research, 7*(1), 19–33.

Thorpe, A., Pouw, N., Baio, A., Sandi, R., Ndomahina, E., & Lebbie, T. (2014). "Fishing na everybody business": Women's work and gender relations in Sierra Leone's fisheries. *Feminist Economics, 20*(3), 53–77.

UNIDO & FIA. (2021). *Gender analysis of post-harvest fisheries in Cambodia. Cambodia Programme for Sustainable and Inclusive Growth in the Fisheries Sector (CAPFISH)*.

Weeratunge, N., Snyder, K., & Sze, C. P. (2009). Gleaner, fisher, trader, processor: Understanding gendered employment in the fisheries and aquaculture sector. *Workshop on Gaps, Trends and Current Research in Gender Dimensions of Agricultural and Rural Employment: Differentiated Pathways out of Poverty. Rome, 31*.

Weidhaas, A. D. (2013). *An analysis of how female business owners construct and communicate identity*. University of South Florida.

Wright, K. E., Lucero, J. E., Ferguson, J. K., Granner, M. L., Devereux, P. G., Pearson, J. L., & Crosbie, E. (2021). The impact that cultural food security has on identity and well-being in the second-generation US American minority college students. *Food Security*, *13*(3), 701–715.

Zampetakis, L. A., Bakatsaki, M., Kafetsios, K., & Moustakis, V. S. (2016). Sex differences in entrepreneurs' business growth intentions: An identity approach. *Journal of Innovation and Entrepreneurship, 5*(1), 29. https://doi.org/10.1186/s13731-016-0057-5

APPENDICES

Appendix I Key Informant Interviews Questionnaires Guideline for interviewing Village head and Community fishery chief/Key important person in the village

Thesis title: "*Gender Differences in the Decision to Change Production and Consumption of Fermented fish paste (Prahok) among Cambodian Fishers in Tonle Sap Lake"*

Informed consent for KIIs

Dear Participant,

My name is Uon Sokmoly, a master student of Asian Institute of Technology, Thailand. Recently, I am conducting a study related to "*Gender Differences in the Decision to Change Production and Consumption of Fermented fish paste (Prahok) among Cambodian Fishers in Tonle Sap Lake".* The purpose of this study is to understand how the changes in access to fish resources lead to gender differences in the decision to change production and consumption of fermented fish paste among fishers in Tonle Sap Lake.

In this interview, I would like you to share more general information about your village and living of people in the village following the questions guideline and the purposes of the study. Your provided information is only used for this study's purposes. Do not hesitate to ask any questions about this study either before or during participating. During the interview, if you are uncomfortable with any of the questions, please let me know and we will move on to the next questions. This study is not associated with any known risks or discomforts. Your participation is voluntary and the conversation will take about 45 minutes.

Date of survey: …….....Category of village:.....

Name of the respondent:……...Sex:……...Age:.....
Position: .....Contact Number:.....

Address: Village: …….....……Commune: .....
District:…….....Province: .....

General information about the village and living of villagers

1. Total number of population and households in the village (Specify number/percentage of males and females).
2. Based on geographical of the village, what are good favorable conditions for people in the village for their living and working?
3. What kind of jobs that people in your village do? Among those kinds of job, what kind of jobs that women usually do? (Why so?)
4. How many percentages of people in the village rely on fishing and fish processing activities? How many fisher households in your village? Do you know, what do they do besides fishing and fish processing activities?
5. What are key challenges for people in the village in terms of infrastructure, employments, natural disaster, and so on?

General information about current living patterns of fishers in the village

6. Regarding fishers in the village, are there anything changes of living patterns of fishers in the village? If have, why does it change and where do they live, now?
7. What have been affected to fishers due to this change (e.g. livelihood, career as fishers, family's income and so on)?
8. How do they feel or react on this issue? Do fishers still continue to do fishing and processing activities? Do you know that why it so?

General information of fishing and fish processing activities in general and fermented fish paste (prahok) makers in particular in the village

9. What kind of fishing activities that people in your village often do? Do you know how many percentages of men and women engage in fishing activities?
10. What kind of dried fish products that fishers usually produce? Is prahok making is a popular one among other dried fish processing? What made you think so?
11. Among total number of fisher households in your village, how many households who have engaged in fishing and producing prahok (only making prahok also counts in)?

- Mostly, do people in your village engage in making prahok as household level/ small business/ large business? Are there any reasons related to this?
- From your observation, who (women or men) normally makes prahok? Any reasons on this?

Perception on trend of changes in production and consumption of fermented fish paste (prahok) among fishers in the village

12. From your observation and perspective, are there anything changes in production and consumption of prahok among fishers in the village between past time and present time? Can you describe more detailed? Do you know why it happened?
13. Do you think that these changes affect much/less to fishers who have engaged in making prahok? What made you think so?
14. According to the changes, do you think that production and consumption of prahok among fishers in the village will increase or decrease or remain stable in the future? What made you think so?

Thank you very much for your kind cooperation!

Appendix II In-depth Interviews Questionnaires Guideline

Thesis title: ***"Gender Differences in the Decision to Change Production and Consumption of Fermented fish paste (Prahok) among Cambodian Fishers in Tonle Sap Lake"***

Informed consent for in-depth interviews

Dear Participant,

My name is Uon Sokmoly, a master student of Asian Institute of Technology, Thailand. Recently, I am conducting a study related to *"Gender Differences in the Decision to Change Production and Consumption of Fermented fish paste (Prahok) among Cambodian Fishers in Tonle Sap Lake".* The main purpose of this study is to understand how the changes in access to fish resources lead to gender differences in the decision to change production and consumption of fermented fish paste among fishers in Tonle Sap Lake. In this interview, I would like you to share more information about your life and career as fishers and processing fermented fish paste (prahok) following the questions guideline and the purposes of the study. Your provided information is only used for this study's purposes. Do not hesitate to ask any questions about this study either before or during participating. During the interview, if you are uncomfortable with any of the questions, please let me know and we will move on to the next questions. This study is not associated with any known risks or discomforts. Your participation is voluntary and the conversation will take more than 1 hour.

Note: The following questions should be answered in order to gather information. Depending on the circumstances, the researcher is flexible to gather information to answer research questions.

Date of survey: …….....Category of village:.....

Address: Village: …….....……Commune: …….....

District……Province: …….....

Respondent contact number:.....

I. Profile of participant

1. Name of interviewee:..... Sex: .....Age:.....
2. Marriage Status:.....Occupation:.....
3. Level of education: .....
4. Number of family's members:..... Number of females:.....
5. Family's members occupations

- Husband's jobs:.....

-Wife's jobs:.....

- Daughters' jobs:.....

- Sons' jobs:.....

- Others:.....

6. Income sources of household (specify both primary and secondary sources of income):.....

.Percentage of income getting from selling prahok (if any):..... .....

7. Could you tell me more about your living situation? **(This question only asking respondents in displaced village)**

- Are you originally living here? If not, where did you live before moving to this place?
- What made you decide to come here?
- What did you do before moving here?
- Now, are you still continuing working those jobs? If yes, what made you keep doing the same jobs/activities as before? (If the respondent did not say anything about making prahok, I will continue to ask: have you made prahok at all? Can walk me through how to make prahok?)
- How do you feel about the relation (change place of living, but still keep doing the same jobs)?

-What are the difficulties in doing those jobs due to changing place of your living, especially in making prahok? How strongly has this change (high/moderate/less) affected it?

II. Situation of fermented fish paste (prahok) production of each participant

8. From the past until now, are you still continuing to make prahok?

- If yes, continue to ask only questions in section A.
- If no, skip section A and move to ask the questions in section B.

❖ Section A: Participants who used make prahok before, they are now still continuing to make prahok

A1. Current situation of prahok production

<u>a. Purposes of making prahok</u>

9. Currently, what are the main purposes of making prahok in your family? (Probe: Home consumption/selling/both consumption and selling)

- If you also sell prahok, when did you decide to sell? Or not sell?

10. How does prahok processing important to you and your family?

- Does making prahok provide you a good job opportunity? What made you think so?
- Does processing prahok provide a good source of your family income, food security, food preservation,...etc?
- How strong is this important to your family? What made you think so?

b. Inputs

11. Can you describe in more detail about inputs for making prahok?
- What kind of inputs do you use to make prahok?
- Where do you buy or access those materials?
- Can you estimate the amount of freshwater fish that you use to make prahok for this year?
- How much does each material cost (current price)?

c. Practicing in making prahok

12. Can you tell me more about your practice in making prahok?
- How long have you/your family engaged in producing prahok?
- When do you usually make prahok? (Probe: seasonal, whole year, ...?) What made you to do so?
- How do you access water for cleaning freshwater fish before making prahok? (Probe: using Tonle Sap water, bring water from other sources,...? What made you decide to do so?

d. Amount of prahok production

13. Can you tell me about the amount of prahok production in your family?
- On average, how many kilograms of prohok that your family usually produce so far?
- This year, how many kilograms of prohok does your family produce?
- What made you decide to produce that amount?

e. Selling

14. What's about selling prahok?
- Where do you sell it?
- This year, how much does prahok cost per kilogram?
- Normally, where do your customers come from (villagers/people outside of village/tourist)?
- Why do they come to buy prahok from you? (Probe: Because of good taste, original product,...etc)

f. Income from selling prahok

15. How much money does your family earn from selling prahok this year?

G. Gender roles and responsibilities of labor in prahok production

16. Do you hire labor for your prahok production?

❖ If yes, how many labors do you hire? (Please specify number of males and females labor)

-What do women and men labor do in your prahok production?

-How many hours do women and men work per day?

-How much wage do women and men labor getting from their work (per day/per month)?

- Do you and your family members also engage in prahok production? If yes, what do they do?

(Please describe women's activities and their working hours:.....

Please describe men's activities and their working hours :.....)

❖ If not hire labor, in your family, who engage in prahok production and what do they do?

(Please describe women's activities and their working hours:..... Please describe men's activities and their working hours:.....)

- Do you think that the engagement of women in your family in producing prahok is important for your family? How strong is this important? What made you think so?

- If you are the one who engage in making prahok in your family, have you ever resent making prahok? Find it an obligation to others?

- Besides engaging in prahok production, do they work for other jobs?

(Please describe women's activities:..... Please describe men's activities: .....)

- What about other members in your family? What do they do if they do not engage in prahok production?

Please describe women's activities:..... Please describe men's activities :.....)

A2. The changes in current prahok production of participants compared to their experience of making prahok

17. Based on your experience in making prahok, what have changed in your current prahok production compared to the time that you used to make prahok?

- Are there any thing change in purposes of making prahok in your family between present and the past time?

❖ Change in inputs

- Do current inputs price increase based on your experience of making prahok? If yes, how much did it cost before? Do you know what made it change?
- Based on your experience, does current amount of freshwater fish that you catch decrease? Before, how many kilograms of fish did you catch? What do you think about the change? What made you think so?
- If your current access to freshwater fish for making prahok is less than before, do you buy fish to make prahok? If yes, who decide to do so? What made he/she decide to do so?
- Is buying prahok in the market is cheaper than buying fish and making, will you still make prahok by yourself? If yes, what made you decide to do so?

❖ Change in practice of making prahok

- Does current access to water for cleaning fish and making prahok change compared to your practice of making prahok that you used to do? If yes, how was it change? What do you think about this change? What made you think so?
- Does this change affect to your prahok production? If yes, who will be the one decide to continue or not continue processing prahok? What made he/she decide to do so?

❖ Change in amount of producing prahok

-Based on your experience of making prahok, does your current prahok production decrease? If yes, how strong it is (high/moderate/ less)? What made it change so?
-What do you think about this change? What made you think so?
-Due to the change, will you still continue to make prahok? If yes/no, what made you decide to do so?

❖ Change in selling prahok

- Do you think that the current price of selling 1 kilogram of prahok is cheaper than the time you used to sell? If yes, what made it change so? What do you think about this change?
- Will you still continue to make prahok for selling? If yes/no, what made you decide to do so?
- Does the current number of customers who buy prahok from you decrease compared to the time as you used to sell prahok? If yes, how strong has it changed (high/moderate/less)? What made it change? What do you think about this change? Any reasons?
- Will your family still continue to make prahok for selling? If yes/no, who decide to do so? What made he/she decide to do so?

❖ Change in income getting from selling prahok

- According to your experience of making prahok, does the current income that you get from selling prahok decrease than before? How strong is it? What do you think about this change?
- Due to the change, will your family continue to make prahok? If yes/no, who decide to do so? What made he/she decide to do so?

❖ Change in household's income

- What's about your current household's income? Does it increase than before? If yes, will your family still continue to make prahok? Who decide to do so? What made he/she decide to do so?

❖ Other changes

- Besides the changes that we have discussed so far, are there anything else that I missed to ask you and you want to add more? If any, what are they? How has it changed your prahok production? What do you think about those changes? Any reasons behind these perceptions?

18. Due to the changes in prahok production, will you encourage your children to continue making prahok? If yes/no, what made you decide to do so?

A3. The changes in prahok production had on gender roles and responsibilities

19. If your prahok production has changed, have women and men in your family still engaged in prahok production?

- If yes, have they still worked with the same tasks as before? Have women's and men's working hours been the same? If no, please specify women's and men's working hours.
- If no, what did they do instead of involvement in making prahok? (Please describe women's and men's works) What made them decide not to involve in prahok production anymore?
- If there is decrease in the time you spend making prahok in your family, what will the women in your family do in their free time? How do the family members feel about the change?
- If women in your family do not engage in prahok at all as before and they will spend more time to household's chores, taking care other members, and/or do other job that can get better income, do you think that it is better for women to do so? If yes, what made you think so?
- How do the family members think about the change?

A4. Current situation of prahok consumption in the family of respondent

a. Ways of prahok consumption

20. How do you make food with prahok?

- Do you usually use prahok as an ingredient for your daily food? If yes, what kinds of food that you normally use prahok? Can you describe how do you consume/put prahok to make each type of foods?
- If you do not have prahok, do you use other ingredients instead of prahok? If not, what made you to do so? If yes, please specify name of that ingredient

21. Normally in your family, who have responsibility in cooking food? Who can decide what to eat or make a dish of food? Why does he/she can make decision on this?

b. Amount of prahok consumption

22. On average, how many kilograms of prahok does your family often consume per year? What's about this year, how much of prahok that you kept for household's consumption? What made you decide to consume that amount of prahok for daily food in your family?

23. Currently, how many people in your family are eating prahok or foods that contain prahok?

A5. The changes in current prahok consumption of participants compared to their experience of consuming prahok

24. Before, how do you make a dish of food from prahok? What kinds of food did you normally use prahok? Can you describe how did you consume/put prahok to make each type of foods?

- Before, how many people in your family were eating prahok or foods that contain prahok together?

25. Do you think that current prahok consumption in your family increase based on your experience of consuming prahok in your family?

-If yes, what do you think about this change? What made you think so?

- If it is not enough for daily consumption, will you buy prahok from others? From whom and where? Who can decide on this matter?
- If you can only produce less amount of prahok and buying prahok in the market is cheap, will you buy/consume large amount of prahok? What made you decide to do so?

26. From your observation throughout generations, does the prahok consumption among them decrease from one generation to another generation? If no, what made you think so?

- If yes, how strong has it changed? What do think about this change?

❖ **Section B: Participants who used to make prahok before, but now they don't make prahok anymore**

B1. Past experience of making prahok

27. If you don't make prahok now, may I know a bit about your experience of making prahok before?

a. Purposes of making prahok

28. In the time of making prahok, what were the main purposes of making prahok in your family? (Probe: Home consumption/selling/both consumption and selling)

- If you also sold prahok in that time, when did you decide to sell? Or not sell?

29. How was prahok processing important to you and your family?

- Did making prahok provide you a good job opportunity? What made you think so?
- Did processing prahok provide a good source of your family income, food security, food preservation, ...etc?
- How strong was this important to your family? What made you think so?

b. Inputs

30. Could you describe about inputs that you used for making prahok?

- What kind of inputs did you use to make prahok?
- Where did you buy or access those materials?
- Do you remember how much each material cost?
- On average, how many kilogram of freshwater fish that you used for making prahok in the past time?

c. Practicing in making prahok

31. Could you tell me more about your practice in making prahok?

- How long had you/your family engaged in producing prahok?
- When did you usually make prahok? (Probe: seasonal, whole year, ...?)
- How did you access water for cleaning freshwater fish before making prahok? (Probe: using Tonle Sap water, bring water from other sources, ...? What made you decide to do so?

d. Amount of prahok production

32. Could you tell me about the amount of prahok production in your family that you used to make so far?

- On average, how many kilograms of prohok that your family produced?

e. Selling

33. What's about selling prahok?

- During the time that you made prahok, did you sell it? If yes, how many percent of total amount prahok that you sold?

- How much did prahok cost per kilogram?

- How many percent of your family income did you get from selling prahok? Do you think that it was a large contribution to your family? What made you think so?

f. Gender roles and responsibilities of labor in prahok production

34. During the time of making prahok, did you hire labor for your prahok production?

❖ If yes, how many labors did you hire? (Please specify number of males and females labor)

-What do women and men labor did in your prahok production?

-How many hours did women and men work per day?

-How much wage did women and men labor getting from their work (per day/per month)?

- Did you and your family members also engage in prahok production? If yes, what did they do?

(Please describe women's activities and their working hours:.....

Please describe men's activities and their working hours :.....)

❖ If not hire labor, in your family, who engaged in prahok production and what did they do?

(Please describe women's activities and their working hours:..... Please describe men's activities and their working hours:.....)

- Did you think that the engagement of women in your family in producing prahok is important for your family? How strong was this important? What made you think so?

- If you were the one who engaged in making prahok in your family, had you ever resent making prahok? Find it an obligation to others?

- Besides engaging in prahok production, did they work for other jobs?

(Please describe women's activities:..... Please describe men's activities: .....)

- What about other members in your family? What did they do if they did not engage in prahok production?

Please describe women's activities:..... Please describe men's activities :.....)

B2. Decisions, reasons, and perceptions of giving up career of producing prahok

35. What are the reasons are decisions of giving up your career of producing prahok?

- What made you decide not to make prahok anymore? (Prob: cost of production, change in living patterns, change in natural resources, consumption's preference,...etc?)

- What do you think about this change? Will it affect to your family income and livelihood? If yes, how strong it is? What made you think so?

- Will you feel that you lose a good job opportunity or career that your family used to do? If yes, how strong of this feeling?

- What do you do now? What's about other members?

- If you have chance to make prahok in the future, will you do it? If yes, what push you to decide so?

B3. Status of prahok consumption during the time of doing prahok

a. Ways of prahok consumption

36. How did you make a dish of foods with prahok?

- Did you usually use prahok as an ingredient for your daily food? If yes, what kinds of food that you used prahok? Can you describe how did you consume/put prahok to make each type of foods?

- If you did not have prahok, did you use other ingredients instead of prahok? If not, what made you to do so? If yes, please specify name of that ingredient

b. Amount of prahok consumption

37. During the time of making prahok, how many kilograms of prahok did your family often consume per year? Who decide to consume that amount? Why so?

38. Normally in your family, who have responsibility in cooking food? Who can decide what to eat or make a dish of food? Why does he/she can make decision on this?

39. How many people in your family were eating prahok or foods that contain prahok?

B4. The changes in current prahok consumption of participants compared to the time of doing prahok

40. May I know more information about consumption of prahok in your family in current time?

- How many kilograms of prahok does your family consume this year? Who decide to consume that amount? What made them decide to do so?

- Current time, what kinds of food that you used prahok? Can you describe how do you consume/put prahok to make each type of foods?

- Currently, how many people in your family are eating prahok or foods that contain prahok together?

- Do you think that current prahok consumption in your family increase compared to the time of making prahok? If yes, is it high/moderate/less increase? What do you think about this change?

- If it is not enough for daily consumption, will you buy prahok from others? From whom and where?

- From your observation throughout generations, does the prahok consumption among them decrease from one generation to another generation? If no, what made you think so?

- If yes, how strong has it changed? What do think about this change?

Thank you very much for your kind participation!

Appendix III Research Ethics Review Certification

RESEARCH ETHICS REVIEW COMMITTEE

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Ref. No.: RERC 2022/028 **28 November 2022**

RESEARCH ETHICS REVIEW

CERTIFICATION

This is to certify that the research entitled "Gender Differences in the Decision to Change Production and Consumption of Fermented fish paste (Prahok) among Cambodian Fishers in Tonle Sap Lake" to be carried out by Ms Sokmoly Uon, a master's student in Gender and Development Studies, Department of Development and Sustainability, School of Environment, Resources and Development, under the supervision of Professor Kyoko Kusakabe, is recommended for "Acceptance" after an expedited review and addressing all recommended modifications.

RESEARCH ETHICS REVIEW COMMITTEE (RERC)

RERC Chair	Signature	Date
Prof Avishek Datta	Avishek Datta	29 November 2022
Dr Ekbordin Winijkul	Ekbordin Winijkul	29 November 2022

RERC Member and Reviewer	Signature	Date
Dr Tobias Endress		01/12/2022
RERC Member	Signature	Date
Dr Chaklam Silpasuwanchai		
RERC Member	Signature	Date

Appendix IV Current Price of Selling Prahok

Types of prahok	Price (riel/kg)	Places of selling prahok
Prahok Sach	20,000	Preaek Sramoach village (Seasonally flooded area)
Prahok Choeng	10, 000	Mok Wat village (Seasonally flooded area)
Semi-processed Prahok Choeng	3, 000-5,000	Chhnok Tru village (Displaced area)
Prahok Choeng	6,000-10,000	Chhnok Tru village (Displaced area)
Semi-processed Prahok Choeng	3,000	Mok Wat village (Seasonally flooded area)
Semi-processed Prahok Sach	10,000	Mok Wat village (Seasonally flooded area)
Prahok Choeng	9,000-13,000	Phsar Leu Thom Thmey (Local market in Siem Reap town)
Prahok Sach	25,000-28,000	Phsar Leu Thom Thmey (Local market in Siem Reap town)
Prahok Choeng	14,000-15,000	Orussey market (Phnom Penh)
Prahok Sach	25,000-30,000	Orussey market (Phnom Penh)

Source: Field survey, 2022