

**Geographical Study on Local Food Activities in Indonesia**  
(インドネシアにおけるローカルフード活動の地理学的研究)

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## ABSTRACT

Indonesia has experienced the food transition from local and national to global food (Simatupang, 2016). In Indonesia as an emergently developing society, does local food represent a remained tradition that will soon be replaced by national or global food, or an alternative to such conventional food? Indeed, recently, the government policy pays more attention to local food to promote diversification of food production and consumption, local food seen as non-rice or flour that represents the national and the global food, respectively. This dissertation attempts to answer this question through two sets of geographical analyses on the regional and local scales.

Following the previous study on local food activities (Ricketts Hein et al., 2006), this dissertation focuses on production and marketing sectors. It offers two main objectives, namely (1) to identify the geographical patterns of local food potentials based on local food production, and (2) to understand the constructed meanings of local food based on local food actors' practices. It also proposes eight research questions: (1) where local food potentials are distributed at the regional level concretely in Yogyakarta Special Province, (2) how these are related to the agro-ecologies that are representing the local natural conditions, (3) to what extent rural communities are deprived concerning the level of poverty and food insecurity, (4) how the local food potentials determine the rural deprivation, (5) what kind of critical issues appear to the producing actors in the rural villages, (6) how these issues are interrelated to their everyday experiences and practices, taking a case of the women farmers' group activities, (7) what meaning of localness of the products the participants construct at their practices in farmers' markets in the city of Yogyakarta, and (8) what kind of mechanism is in the farmers' markets related to the participants' motives.

This dissertation consists of six chapters with four empirical studies. Chapter 1 is an introduction providing a brief overview of the historical changes of local food conditions in Indonesia based on a short literature review, the purposes and research questions, research methods and approaches of this dissertation, and a brief overview of the main target area.

Chapter 2 identifies the two regencies, on which the local food potentials concentrate, in Yogyakarta Special Province, asking the research questions (1) and (2) (first seen as Widiyanto, 2019a). This chapter explains why the villages that really produce local food actively are not located in the potentially suitable areas of local food crops based on the agro-ecological zones.

Chapter 3 is guided by the research questions (3) and (4) (first seen as Widiyanto, 2018). This chapter identifies that the villages of poverty and food insecurity are located in the upland area, with relatively active local food production but lack of marketing opportunities, and discusses the possibilities of upsetting such physically and socially deprived livelihood situations by connecting the local food centres to the upland area.

Chapter 4 proposes answers to the research questions (5) and (6). This chapter identifies seven themes reflected to critical problems on women farmers' practices, namely materiality, functionality, local food systems, government initiative, identity, structure, and space. This chapter also conceptually shows close interrelationship between local food practice and rural social structure including the gender relation.

Chapter 5 aims to answer the research questions (7) and (8) (first seen as Widiyanto, 2019b), attempting to add a case study of farmers' markets in the urban setting of developing countries as an example of small-scale farmers' markets. This chapter finds that the vendors and managers as a main actor focus on the meaning of local food as healthy food at the discursive level, and that a farmers market plays an important role for social interactions based on the trust between producers and consumers.

In the end, Chapter 6 provides concluding remarks: first, the spatial pattern of local food concentration is identified based on their local food potentials. Second, the upland area that seems suitable for local food cultivation in the natural sense is lacking commercialised production in the most parts, critically identified as the most deprived area based on the poverty and food insecurity conditions. Third, it can be identified that some kinds of themes are found in the connection between the local food practices and the roles of women in a rural village. Fourth, in the market sector, the concept of healthy is important in the constructed meanings of local food.

To sum up, exploring local food activities in Yogyakarta Special Province, this dissertation concludes that local food activities in Indonesia are situated at the crossroads of meanings of local food: first as a resource or a tool-kit for rural development, providing an important livelihood, second as residual in the sense that the production of local food is exclusively conducted by women as a mother to take care of the health of her family members, and third as a vehicle for the food actors to scale themselves up in terms of economy connecting the concept of healthy to imaginative localness, typically seen at a farmers' market.

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# **CHAPTER 1**

# CHAPTER 1. INTRODUCTION: LOCAL FOOD TRANSITION IN INDONESIA

## 1.1. INTRODUCTION

It is essential to begin with a retrospective review of local food studies (Scharber & Dancs, 2016). Historically, citing from Schneider and Francis on their review of local food studies in the United States from the early 1980s to early 2000s, Adams and Salois explain the meaning of local food particularly from consumers' perspective between organic and local (Adams & Salois, 2010). Focusing on the demand side of local and organic food, Adams and Salois propose several future research agendas: such as firstly, the role of local food market on developing local food sectors (Thomson and Kelvin, 1996, cited in Adams & Salois, 2010). Specifically, Adams and Salois argue how important a farmers' markets are as a market place for producers to sell local food. Secondly, the importance of the notion of food miles, and people's awareness and its relationship with environmental impacts (Adams & Salois, 2010). Thirdly, the role of local food industry to fulfil people's food demand (Adams & Salois, 2010).

In the early 1990s, several local food initiatives, such as farmers' markets, and Community Supported Agriculture (CSA) emerged in the United States of America and north European (Fonte, 2008). Food miles was introduced by Paxton in 1994 as a concept that pays attention to the environmental issues from the sustainable development perspective in the United Kingdom (Hiroki, Garnevska, & McLaren, 2016). In the late 1990s, Adams and Salois identify shifting interests from organic food to local food (Adams & Salois, 2010). At the same time, Buchan et al. identify the planning of local food systems in the urban context of North America based on two key concepts of local scale and local food definition (Buchan, Cloutier, Friedman, & Ostry, 2015).

In the early 2000s, there was an interest in local food campaign such as 'Buy American' (Hinrichs & Allen, 2008). Around the mid-2000s, there was an interest in local food activity in the United Kingdom (Ilbery, Watts, Simpson, Gilg, & Little, 2006; Ricketts Hein, Ilbery, & Kneafsey, 2006). Local food has attracted more scholars' attention since the early 2000s (Hunt, 2015/2017). Concerning the issues of local food, Hunt takes the policy perspective. He examines and compares two sets of local food policy in the UK and the USA, introducing the theory of food system practices based on the ideas of the social movement, stakeholder, and value of local food. Interests in local food activity in the European context (for example in Scotland and Hungary) still continue in the early 2010s to mid-2010s (Benedek & Balázs,

2016; Watts, Leat, & Revoredo-Giha, 2011).

## 1.2. LITERATURE REVIEW

The food supply chains have increasingly been globalised in the contemporary world at least for a recent couple of decades (for example see Arce & Marsden, 1993; Flynn & Bailey, 2014; Murdoch, Marsden, & Banks, 2000). More recently scholars pay attention to the localisation of food (for example see Allen, 2010; Dwiartama & Piatti, 2016; Eriksen & Sundbo, 2015; Hinrichs, 2003; Kirwan, Ilbery, Maye, & Carey, 2013; Laforge, Anderson, & McLachlan, 2017; Miroso & Lawson, 2012; Paloviita, 2010; C. J. Peters, Bills, Lembo, Wilkins, & Fick, 2009; Tregear, 2011). Local food is defined in various ways, for example, in terms of the production place (for example see Berg & Sevón, 2014; Carbone, 2018; C. Gupta & Makov, 2017; Touzard, Chiffolleau, & Maffezzoli, 2016). Some scholars pay attention to the origin of food (for example see Bandoniene, Meisel, Rachetti, & Walkner, 2018; Fernández-Ferrín, Bande, Martín-Consuegra, Díaz, & Kastenholz, 2020), some focus on local materials (for example see Moore, 2004 cited in Fonte, 2008; Pusat Penganekegaran Konsumsi dan Keamanan Pangan, 2019), others are interested in studying the length of the supply chain (for example see Ilbery & Maye, 2006; Kneafsey, Venn, & Bos, 2017; Maye & Ilbery, 2006; Rucabado-Palomar & Cuéllar-Padilla, 2020). Some scholars focus on the local tradition or culture of food (for example see Cappellini, Parsons, & Harman, 2015; De Massis, Frattini, Kotlar, Petruzzelli, & Wright, 2016; Tellstrom, Gustafsson, & Mossberg, 2005), others have an interest in the local environment (for example see Morland, 2015), and also in *terroir* (for example see Bråttå, 2017; Broadway, 2015; Gyimóthy, 2017; Halvaksz II, 2013). However, there is no consensus on the social meaning of local food (DeWeerd, 2010; Eriksen, 2013; Fler, 2008; Fuchs, 2017). According to Cuthbert, a definition of local food closely relates to distance or food miles, and local economy and environment (Cuthbert, 2010, pp. 24-25). Everybody could have his/her local food definition (Granvik, Joosse, Hunt, & Hallberg, 2017). The character of local food is open to a variety of explanation and interpretation (Timmer, 2015, p. 206).

This dissertation focuses on local food in the aspect of a natural resource and socio-economic. According to Duram and Oberholtzer (2010), the geography of local food is accessing local food as a natural resource. In their review, a natural resource is consisted of agroecology (as discussed in Chapter 2), biodiversity, water, and soil (Duram & Oberholtzer, 2010). Another research of Benedek & Balázs (2016) identifies two main limitations in their

paper, namely lack of the biophysical aspect and mapping of local food systems and local food activities (see Chapter 2). This dissertation attempts to fill in this gap by focusing on the biophysical aspect of local food resource in Yogyakarta Special Province.

Local food is also associated with the socio-economic aspects, such as livelihood (Dame, 2018), poverty (Psarikidou, Kaloudis, Fielden, & Reynolds, 2019), and food insecurity (Christaldi & Pazzaglia, 2018). According to Kelly, Seubsman, Banwell, Dixon, and Sleigh (2015) the socio-economic aspect refers to “rich to poor” while the geographic aspect refers to “urban to rural” (Kelly et al., 2015, p. 445; Psarikidou et al., 2019).

Previous researches on local food study socio-economic components of activities concerning local food (Benedek & Balázs, 2016; Ricketts Hein et al., 2006). For Ricketts Hein et al. socio-economic components of local food activity consist of three indicators related to marketing, namely number of farm shops, women's organisation cooperative, and farmers' markets (Benedek & Balázs, 2016; Ricketts Hein et al., 2006). Besides, Ricketts Hein et al. also choose three indicators regarding production, namely number of local food directories, local food producers, and licenced organic farmers and growers (Benedek & Balázs, 2016; Ricketts Hein et al., 2006). Specifically, regarding discussing local food activity, this dissertation only focuses on the production and marketing aspects by taking the example of Women Farmers Group and Farmers Market, respectively.

The scale is mentioned as one of the key concepts alongside space, time, nature, environment, and place (Harvey, 1996; Horvard, 1996 cited in Howitt, 1998). According to *The Dictionary of Human Geography*, a scale can be defined as “level of representation” (Johnston et al. cited in S. A. Marston, 2000, p. 220). Geographically, there is various name for the concept of scale, namely cartographic scale or map scale, observational scale, measurement scale, operational scale, and geographic scale (Crawford, 2020; S. A. Marston, 2000). The concept of scale has attracted many human geographers for around forty years (Howitt, 1998; Sallie A. Marston, Jones, & Woodward, 2005). Human geographers use metaphors called “the hierarchical ladder” or what Howitt called as “geographical scale” consist of global, national, regional, and local to define scale (Crawford, 2020, pp. 91-92; Howitt, 1998, p. 50).

In another discussion, Howitt explains scale on three dimensions of size, level, and relation (Howitt, 1998; see also S. A. Marston, 2000). Following Haggett for Howitt, scale as size shows a map scale (Howitt, 1998). Also, in the quantitative terms, scale as the size is useful, for example, to explain some measurements of distance or area (Sayre & Di Vittorio, 2020). For scale as level, Howitt cited Edwards to explain the metaphor of a pyramid to demonstrate

the sale in a nested hierarchy. A nested hierarchy is useful when geographers examine the pattern or process through spatial analysis and statistics (Crawford, 2020). Howitt points out another discussion of scale as a relation to include other components such as space, place, and environment that cannot be discussed using a scale as size or level (Crawford, 2020; S. A. Marston, 2000).

In this dissertation, I use a scale in the geographical term. For my empirical studies particularly in Chapters 2 and 3, I provide examples of regional-level analysis from the geographical scale perspective using Geographic Information Systems (GIS) (Paasi, 2004; Turner, O'Neill, Gardner, & Milne, 1989). In Chapters 4 and 5, I provide examples of local-level analysis. This local-level analysis (R. Phillips & Wharton, 2016b) is about the experiences and practices of food actors such as producers, distributors, vendors and consumers either in rural villages or in cities. According to Taylor, the urban level is an example of a 'scale of experience' (S. A. Marston, 2000; Taylor, 1982).

In their paper on the topic of local food, Ilbery and Maye explain two binary opposite concepts of the local and the global, and the conventional and the alternative (Ilbery & Maye, 2006, p. 355). For them, the local is closely related to the alternative while the global represent the conventional. Besides, Morgan, Marsden, and Murdoch (2006) operationally define the conventional (agri-food) system in terms of a role of big companies with the global or national scale, while the alternative is the vice-versa or characterised by prominent small companies that are applying ecological practices and serving local markets. Ilbery and Maye (2005a) explain this binary opposition for agri-food system using a supply chain lens, paying special attention to the concept of short food supply chain as previously studied by Marsden, Banks, and Bristow (2000), Renting, Marsden, and Banks (2003), and Ilbery and Maye (2005b). In this dissertation, I attempt to ask an alternative meaning of local food, elaborating on scale and short food supply chain in analysing FMs in Yogyakarta (see Chapter 5). In line with the alternative, the food chain perspective is also noted by Corsi, Barbera, Dansero, Orlando, and Peano (2018). They point out several approaches of the alternative food networks: economic, sociological, environmental, anthropological, and geographical approach (Corsi et al., 2018). For the geographical approach, particularly from the economic geography, geographers are interested in studying an economic issues concerning on the quality turn and the cultural turn (Corsi et al., 2018).

### **1.3. LOCAL FOOD IN INDONESIA**

The latest situation of local food is identified in Indonesia's food transition (Simatupang, 2016). In Asia in the modern context of food transition studies, for example, Japan experienced after the Second World War period show there is a decreasing on consuming carbohydrate food sources, animal food, and salt; while in China due to people welfare improvement there is a rising on consuming fish, eggs, sugar, and meat (Bengoa, 2001). Another recent survey of food transition was conducted in Singapore by Rut and Davies (2018). Following this issue of food transition, there is a question to what extent is a local food transition in the context of Indonesia? To answer this question, I provide a short review of local food transition.

Local food revives as a global phenomenon during the last decades (Pinkerton & Hopkins, 2009). From the UK experiences, three factors of peak oil, climate change, and economic crisis are vital determinants of why to turn to local food or it is called as "transition initiative" (Pinkerton & Hopkins, 2009). Moreover, this initiative is followed by other activities of concerned people in a particular community. For example, Claire Milne in Pinkerton and Hopkins's book provides an explanation about the Bristol experience of local food transition (Pinkerton & Hopkins, 2009). Moreover, she argues that health, sustainability and producer-consumer interaction is the key points for the transition (Pinkerton & Hopkins, 2009).

Bengoa (2001) defines food transition "as any change in food consumption and food-related practices of the population in an economically emerging country", and points out that "food transitions are accompanied by other changes in lifestyle" (p. 1425). Food transition is needed to be studied in developing countries (Quintero-Lesmes & Herran, 2019). Quintero-Lesmes and Herran (2019) argue, based on the reviews of several previous works, that food transition is essential when the traditional practices of the inhabitant are co-existed with other food practices (p. 6)

An initial important of the food transition is presented by Simatupang (2016). Figure 1.1 shows changing food consumption patterns in the last 50 years in. According to changing patterns of consumption, Simatupang points out three kinds of food in recent Indonesia, namely local food, national food, and global food (Simatupang, 2016). Several commodities represent these food types. He classifies maize, cassava, starch, and sweet potatoes as local food, rice as national food, and wheat as global food, observing that rice consumption drastically decrease especially since the 1990s, while wheat consumption increases in the same period. Commodities classified as local food remains stagnant, or rather tends to slightly decrease. Following his analysis at the national level, local food is not so important in quantity at least

up to the early 2000s, and the food transition in these periods in Indonesia can be seen as the national to global change.

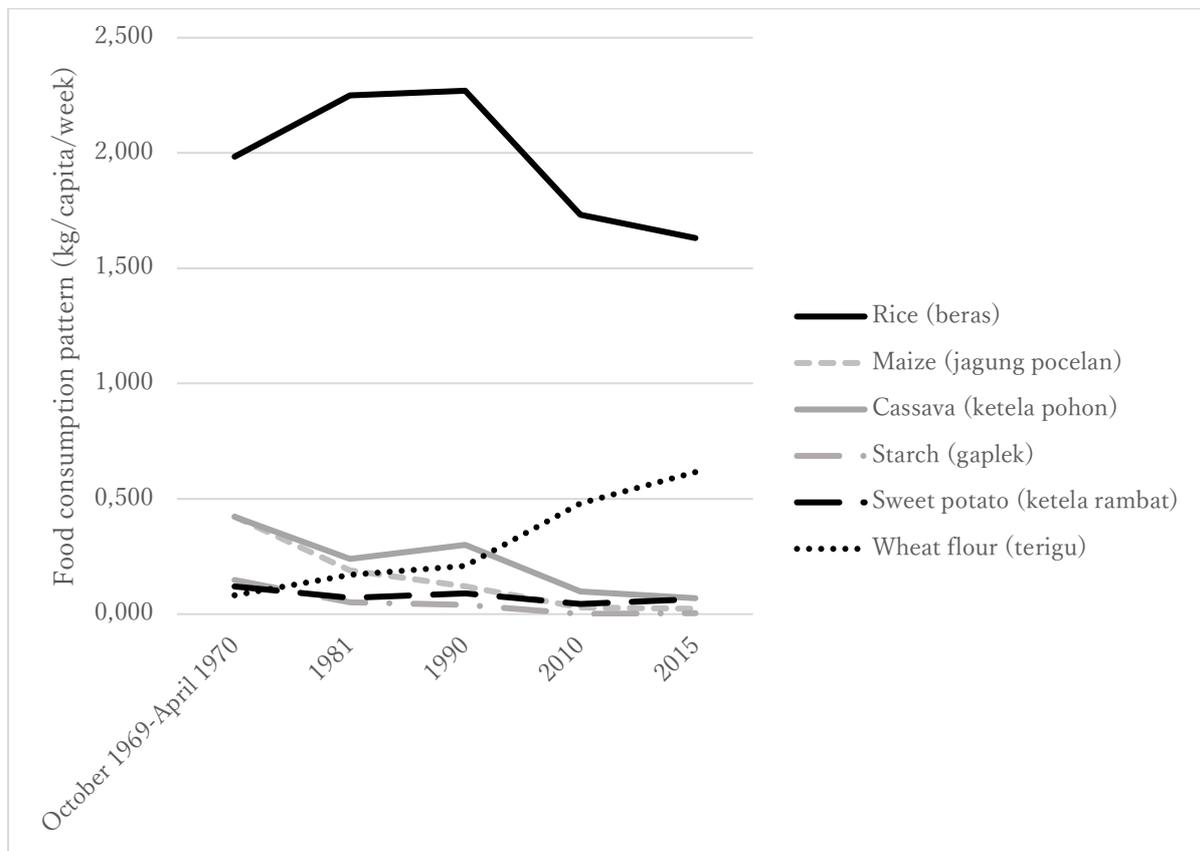


Figure 1. 1. Food transition in Indonesia.  
Source: data from Simatupang (2016)

Indonesia has around 265 million population in 2018 (BPS-Statistics Indonesia, 2019c), and according to the estimation, approximately 318 million in 2045 (Kementerian PPN/ Bappenas, Badan Pusat Statistik (BPS-Statistics Indonesia), & UNFPA, 2018). Increasing population leads the country to food scarcity (M. Gardjito, Djuwardi, & Harmayani, 2013). According to BPS, in Indonesia, the monthly consumption of three commodities such as rice, sweet potato and instant noodle tend to decrease from 2015 to 2019 (Supriyanto, 2019). On the other hand, other commodities such as wheat flour, cassava, and noodle with meatball or boiled or fried noodle tend to increase in the same period (Supriyanto, 2019).

There are differences in the food consumption pattern between urban and rural populations (Figures 1.2 and 1.3). Rice, cassava, sweet potato, sago, and other kinds of tubers are consumed more highly by rural Indonesian inhabitants. In contrast, urban inhabitants in Indonesia tend to increase wheat consumption.

Urban Indonesian tend to consume more prepared foods and beverages compared to rural Indonesian (Supriyanto, 2019). Further, prepared cereals like cornflakes and vegetables are absorbed more by rural Indonesian (Supriyanto, 2019). These differences in food consumption are related to the rural-urban difference in individual habits, food availability, and environmental characteristics (Elizabeth et al. 1981 cited in Supriyanto, 2019).

Further, the cities in Indonesia have seen drastic social changes more recently. According to the data in 2012 from McKinsey Global Institute, cited by Afif (2015), the number of Indonesian middle-class covers 57 % of all the Indonesian population in 2010, gradually increasing more recently (Afif, 2015). There is a question regarding the increase in Indonesian middle class people and the changing patterns of food consumption. Supriyanto cited Engel's Law relating to income and food consumption (Supriyanto, 2019). According to Engel's Law, people gain higher income and consume less food (Supriyanto, 2019).

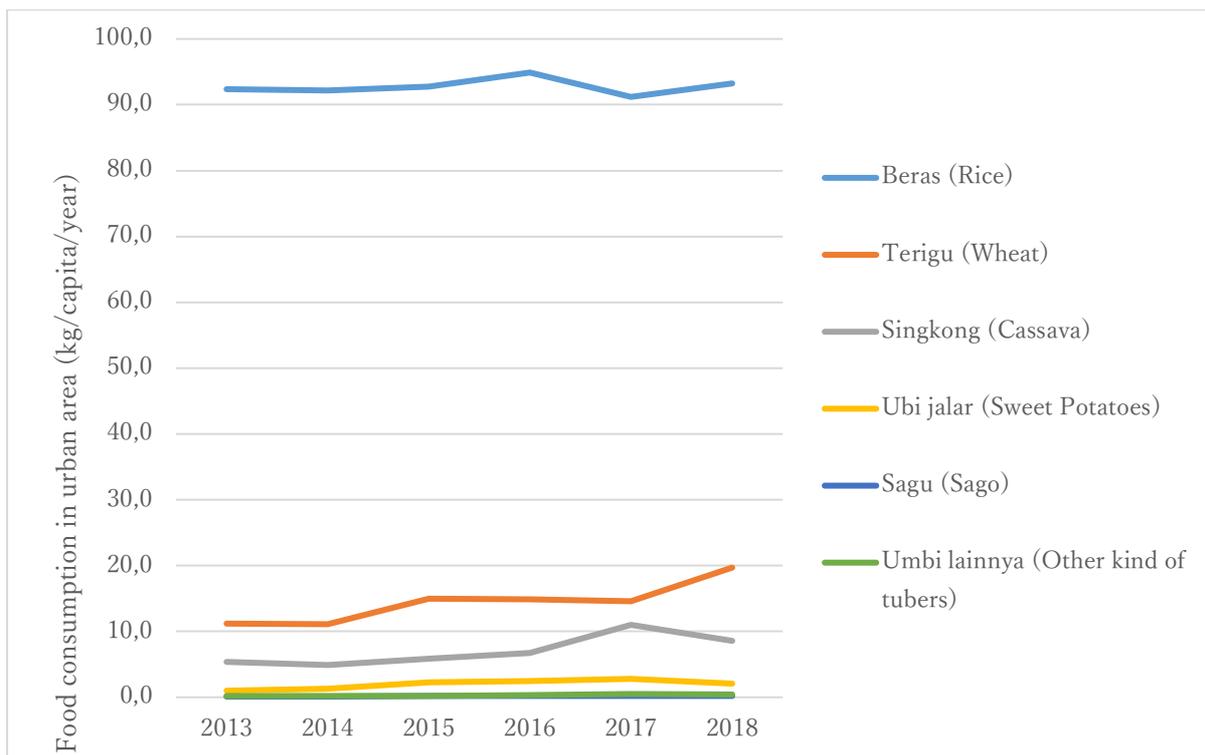


Figure 1. 2. Food consumption in the urban area of Indonesia.

Source: Buku Direktori Perkembangan Konsumsi Pangan 2019, Badan Ketahanan Pangan Kementerian Pertanian (2019)

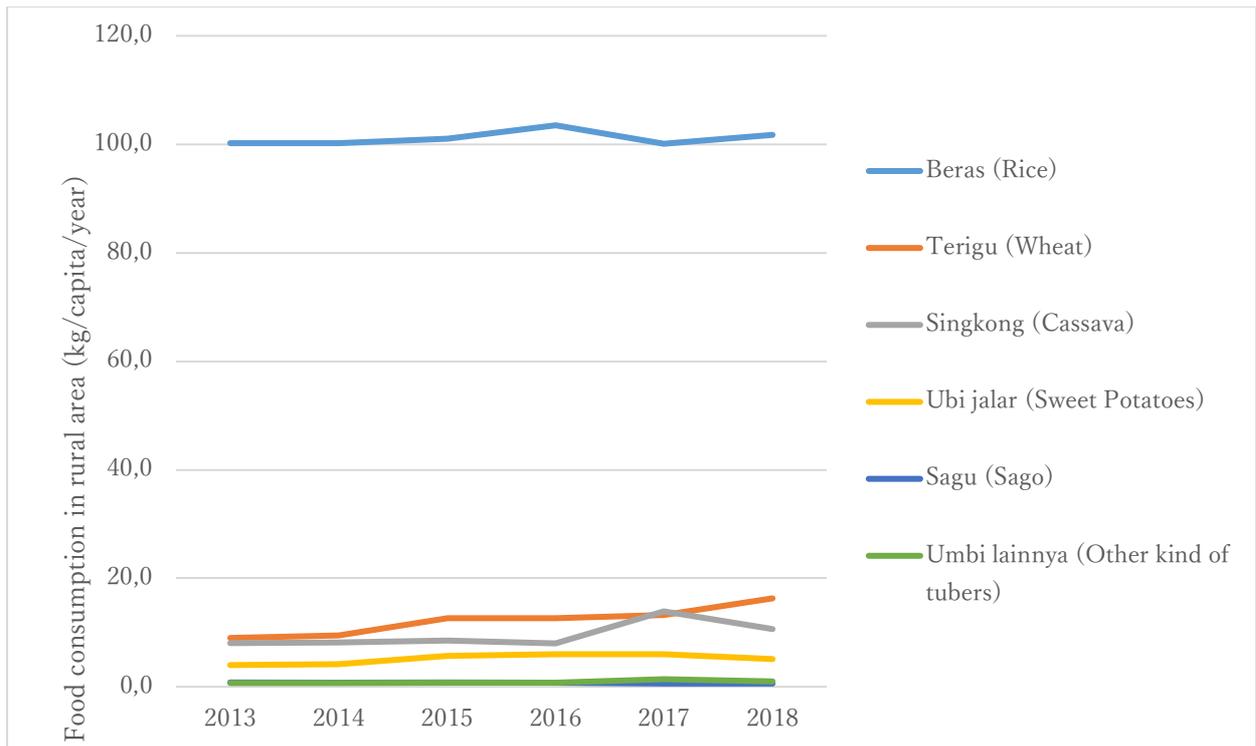


Figure 1. 3. Food consumption in the rural area of Indonesia.

Source: Buku Direktori Perkembangan Konsumsi Pangan 2019, Badan Ketahanan Pangan Kementerian Pertanian (2019)

Here, I attempt to continue discussing these trends at the regional level, as an example of Yogyakarta Special Province (Daerah Istimewa Yogyakarta: DIY) that is the main target of analysis in Chapters 2 and 3 of this dissertation, and the geographies of which are briefly mentioned in this chapter.

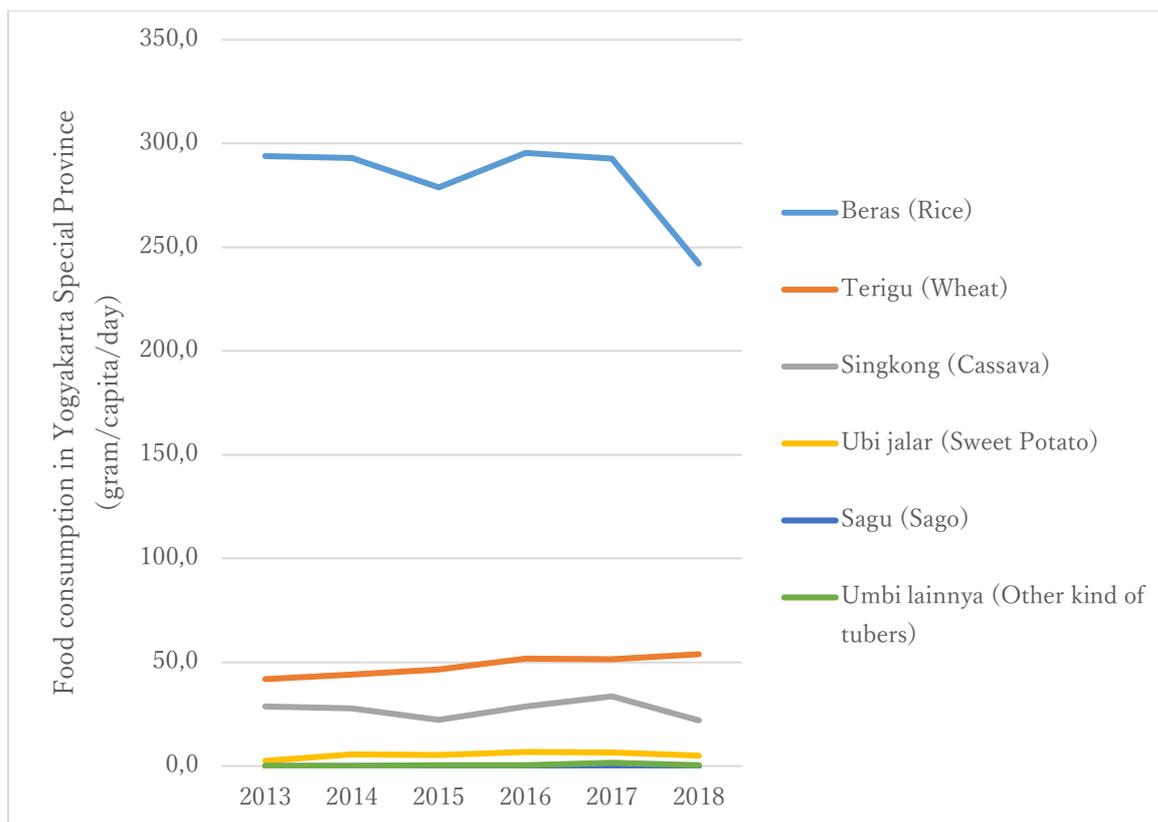


Figure 1. 4. Food consumption in Yogyakarta Special Province.

Source: Buku Direktori Perkembangan Konsumsi Pangan 2019, Badan Ketahanan Pangan Kementerian Pertanian (2019)

Figure 1.4 shows that people in DIY consume rice in large part compared to other commodities such as wheat and tuber. However, it also shows a declining trend clearly in rice consumption and a little bit increasing slowly in wheat consumption from 2013 to 2018. National Food Security Agency of the Indonesian Ministry of Agriculture identifies three patterns of food consumption in DIY for rice, wheat, and cassava (Badan Ketahanan Pangan Kementerian Pertanian RI, 2012).

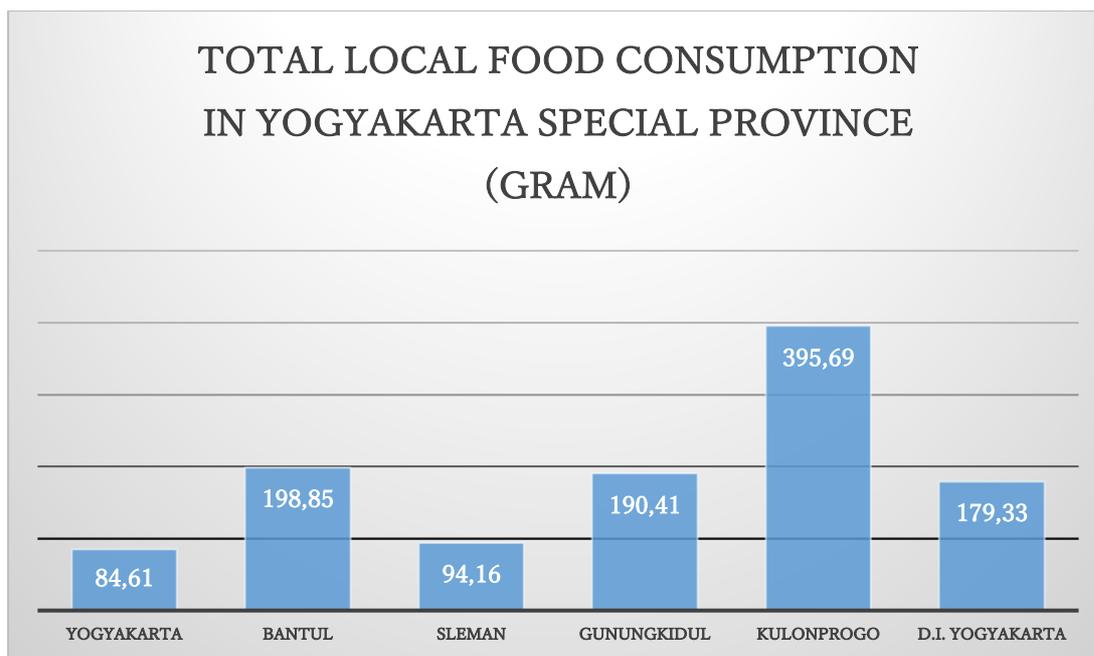


Figure 1. 5. Total local food consumption (in grams) in Yogyakarta Special Province.  
Source: Laporan akhir kajian pola konsumsi pangan lokal tingkat rumah tangga tahun 2017  
Badan Ketahanan Pangan Penyuluhan (BKPP) DIY and PT. Alam Mataram Sejahtera  
(2017)

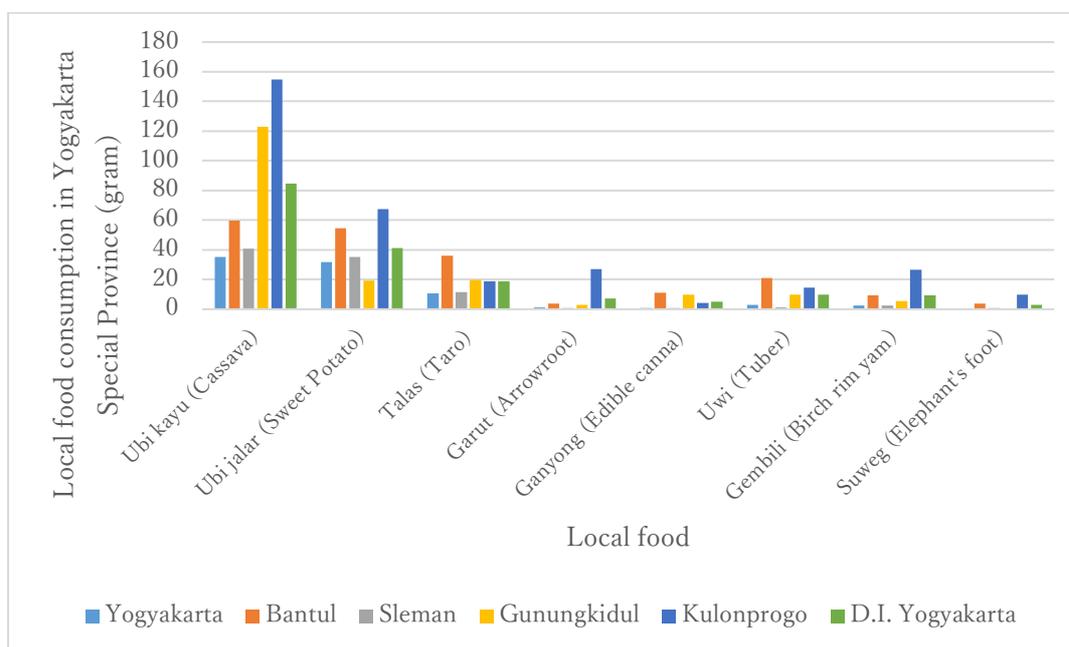


Figure 1. 6. Local food consumption (in grams) in Yogyakarta Special Province.  
Source: Laporan akhir kajian pola konsumsi pangan lokal tingkat rumah tangga tahun 2017  
Badan Ketahanan Pangan Penyuluhan (BKPP) DIY and PT. Alam Mataram Sejahtera  
(2017)

Figures 1.5 and 1.6 show the condition of local food consumption in DIY. Among the one municipality and four regencies in DIY, people in Kulon Progo consume local food in the

largest amounts (Figure 1.5). The amounts of local food consumption in three regencies, namely Kulon Progo, Gunungkidul, and Bantul, exceed the average of DIY (D. I. Yogyakarta). For the varieties of local food commodity, in Kulon Progo cassava (*ubi kayu*), sweet potato (*ubi jalar*), arrowroot (*garut*), lesser yam (*gembili*), and elephant foot (*suweg*), and in Bantul taro (talas), canna (ganyong), and purple yam (uwi) is consumed more than in others in DIY, respectively (Figure 1.6). These regencies include a wide extent of rural areas, some in mountainous area as mentioned for details in Chapter 2. Thus, the difference in food consumption patterns between rural and urban areas can be seen at the regional level.

It is said, therefore, that rice is favourite food for most of the Indonesian (McCulloch & Peter Timmer, 2008; Suwidjana, 1981). Rice, with its vital position as a leading staple food, has centred on the governmental food policy (Khudori, 2008; Marks, 2010; Panuju, Mizuno, & Trisasongko, 2013). According to Suwidjana (1981, p. 149), the first rice program was designed by the government in 1959, called “padi centres”. Also, McCulloch and Peter Timmer (2008, p. 33) explain that during the New Order regime three main policies on rice had stressed the high investment into production infrastructure from the initial phase in the 1970s.

Returning to the discussion regarding the Indonesian population growth, there is one question: how to fulfil people needs of food? The Indonesian government has emphasised food diversification for the solution (M. Gardjito et al., 2013). The first governmental initiative regarding diversification policy was set up in 1969 through the project called “Applied Nutrition Program” (Khudori, 2008, p. 116). Khudori further explains that the government introduced rice called “beras tekad”, a type of rice or synthetic rice made from cassava, beans, and corn (see also Aryono, n.d.). This program was then supported by Instruksi Presiden (The Presidential Instruction) under the strategy to provide better menus to the people in 1975 and later revised in 1979 (Badan Ketahanan Pangan Kementerian Pertanian RI, 2012; Khudori, 2008). Other programs and policies regarding food diversification were provided chronologically in Roadmap Diversifikasi Pangan (Roadmap of food diversification) 2011-2015 (Badan Ketahanan Pangan Kementerian Pertanian RI, 2012). For the food diversification, the government pays more attention to a strategy to produce food based on local resources (“Undang-Undang Republik Indonesia Nomor 18 tahun 2012 tentang Pangan,” 2012). Thus, local food is increasingly emphasised as “food from carbohydrate, protein, nutrient, and mineral which is produced and developed based on local based resource and local culture” (“Peraturan Menteri Pertanian Nomor: 43 / Permentan / OT.140 / 10 / 2009 tentang Gerakan percepatan penganekaragaman konsumsi pangan berbasis sumber daya lokal,” 2009)

## **1.4. LOCAL FOOD POLICY IN INDONESIA**

In his book, Allan Hunt differentiates the local food policies of two countries: the USA and the UK (Hunt, 2015/2017). Hunt concludes that England's local food policy is based on the instrumentalism while that of the USA takes the transformation perspective. In Indonesia, as mentioned above, Arsil et al. show that the local food policy is placed under food diversification persuading to consume more local food (Arsil, Brindal, Kusmantoro Eddy, & Mulyani, 2018; Poppy Arsil, 2014)

In my conversation with an Indonesian local food expert, she mentions three critical problems of local food, namely lacks of definition, data availability, and local food policy (Moerdijati Gardjito, 2017). Arsil et al., citing the guidance of local food movement of the Indonesian Agricultural Department and the food security policies of the Indonesian Secretary of State, argue that there are two weaknesses of the local food policy. The first weakness is typically seen in the top-down mechanism of the policy implementation and the second is that the policy is predominantly taken initiative by the government (Poppy Arsil, 2014, p. 1534). Regarding these challenges, Amy and Monica suggest to invite more public participation and to focus on the local food systems (Amy & Monica, 2015).

The policy is an action taken by an individual or organisation to solve a particular problem (Anderson 2011, cited in Kraft & Furlong, 2013). On discussing public policy, there are five key concepts, namely intentions, goals, plans or proposals, programs, and decisions or choices (Jones, 1984 cited in Kraft & Furlong, 2013). The policy covers various aspects, for example, economic, health care, welfare and social security, education, environmental and energy, foreign and homeland security (Kraft & Furlong, 2013).

An example of food policy is shown by Kraft and Furlong taking a Supplemental Nutrition Assistance Program or SNAP. SNAP or food stamp program is managed by the United States Department of Agriculture or USDA (Kraft & Furlong, 2013). SNAP is a food program for poor households. Related to anti-poverty food program, the USDA manages the national school breakfast and lunch programs (Kraft & Furlong, 2013). Through these programs, the government attempts to ensure food for children of poor households.

From Allan Hunt's analysis of local food policy concludes four types of narratives in the local food policies, namely transformation, instrumentalism, marketism, and individualism (Hunt, 2015/2017). Further, Hunt develops these four types, combined with Feldman's semiotic square techniques (Feldman, 1995) to a two-axis relationship, the shared and private goods on the vertical axis, and the institutional or individual influences on the degree of food availability

on the horizontal axis (Hunt, 2015/2017, p. 12). For Hunt, the origin or what he explains as “knowing where one’s food comes from” (Hunt, 2015/2017, p. 9) is important for the ‘transformation’ type of food policy, and in this sense characterised by the action of local food movement, involving a community responsibility. Instrumentalism refers to the three contexts of agriculture, food poverty, and rural development, and is characterised by the public sector responsibility. Thirdly, the private sector has a significant role in the marketism type of local food policy.

Individualism type is dependent on an individual preference on choosing what kind of food based on the benefit, for example health advantages on consuming local food. Hunt argues that this type is closely related to local food promotion through media such as newspapers, magazine, and food advertising.

Historically, the Indonesian government has been paid attention to the local food policy since the 1960s (Arsil et al., 2018). In the late 2000s, the government stipulated a regulation (Government Regulation No. 22 in 2009) concerning local food consumption through a diversification approach (Arsil, Li, Bruwer, & Lyons, 2014; Wardis, 2014). Nationally, there are two other regulations related to local food in Indonesia, namely Minister Regulation of movement of food diversification based on local resources (Peraturan Menteri Pertanian Nomor: 43/ Permentan/ OT.140/10/2009), and the National Law of Food (Law number 18 in 2012). Then, provinces and regencies/municipalities have also stipulated their local food policies.

Indonesia is the fourth most populous country in the world (The World Bank, 2020), with around 265 million population (BPS-Statistics Indonesia, 2019a, 2019b) in 2018 in thirty-four provinces. Indonesia has more than 300 ethnic groups (Arsil et al., 2018; The World Bank, 2020), with a variety of tradition and culture (Arsil et al., 2018).

This section works with various provincial laws or regulations related to local food (Appendix 1), as typical policy documents (Kraft & Furlong, 2013). These documents were collected from the websites of the provincial governments. I drew key descriptions from these food policy documents, focusing on three dimensions of Cooper et al.’s model (Cooper, Fusarelli, & Randall, 2004); that is, three concepts of the policy goals are the normative, the structural, and the constitutive dimensions. Then, the results are presented in Tables 1.1, 1.2, and 1.3, using comparative analysis to explain what kinds of difference and similarity between province groups of “Java” and “Outer Java” (Geertz, 1963; K. Gupta, 2012; Ragin, 1994). Clifford Geertz develops these groups based on the different ecosystems between “Java”

including Bali and West Lombok (Nusa Tenggara Barat: NTB), and “Outer Java” islands, which have more potential in paddy and prosperous areas of sago, respectively (Geertz, 1963, p. 14). These groups are then accompanied with information about the food policies containing goals, roles, and considerations of some organisations for the selected and available provinces (Cooper et al., 2004; Owen, 2014a, 2014b).

Table 1. 1. The normative dimension of Indonesia local food policy

<b>Normative Dimension</b>	<b>Java (including Bali and NTB)</b>	<b>Outer Java</b>
Goals	<ul style="list-style-type: none"> <li>- To consume various, safety, healthy food based on local potent (DIY, Jabar, Jateng, Jatim, Banten)</li> <li>- To achieve <i>Pola Pangan Harapan</i> (a food diversification index in Indonesia) (Jabar, NTB)</li> <li>- To maintain local food supply with affordable price (Jateng, Bali)</li> <li>- Reduce rice consumption and to consume vegetables, fruits, meat, peanuts, and yams (Jabar, Jateng)</li> <li>- Develop yams processing technology to increase its value-added (Jabar)</li> <li>- To improve local food systems (Jateng)</li> <li>- Knowledge and habit for students to consume local food (DKI)</li> <li>- To protect and support local fruits businessmen/businesswomen (Bali)</li> <li>- To improve access for productive resources (Bali)</li> <li>- To enhance competitive advantages for local fruits businessmen/businesswomen (Bali)</li> <li>- To develop the provincial government roles on supporting local fruits</li> </ul>	<ul style="list-style-type: none"> <li>- To diversify food based on its local potent (Sumbar, Babel, Maluku, Kalbar, Kaltara, Sulbar, Sulteng)</li> <li>- To increase the habit of consuming local food (Kaltara, Gorontalo, Maluku, Babel)</li> <li>- To maintain affordable food price (Kalbar, Maluku, Kaltara)</li> <li>- To create food security (Kalbar, Gorontalo, Maluku)</li> <li>- To develop local food trading and distribution (Maluku, Sumbar)</li> <li>- To ensure local food availability (Kalbar, Maluku)</li> <li>- To protect local food varieties (Kalbar, Maluku)</li> <li>- To achieve <i>Pola Pangan Harapan</i> (a food diversification index in Indonesia) (Sumbar)</li> <li>- To improve people welfare (Sumbar)</li> </ul>

Normative Dimension	Java (including Bali and NTB)	Outer Java
	<p>businessmen/businesswomen (Bali)</p> <ul style="list-style-type: none"> <li>- To enhance society participation and businessmen/businesswomen to empower local fruits (Bali)</li> <li>- To ensure business certainty and sustainability on marketing local Balinese products (Bali)</li> <li>- To regulate local Balinese products administration (Bali)</li> <li>- To increase quantity, quality, and continuity production (Bali)</li> <li>- To increase occupation opportunity (Bali)</li> <li>- To increase economic growth (Bali)</li> <li>- To improve people welfare (Bali)</li> <li>- To manage the acceleration of local food diversification (NTB)</li> </ul>	<ul style="list-style-type: none"> <li>- To increase people demand local food (Jambi)</li> <li>- To enhance local food products (particularly non-rice and non-flour products) (Jambi)</li> <li>- To improve the provincial government role in implementing local food program (Jambi)</li> <li>- To explore local wisdom (Babel)</li> <li>- To develop and maintain cooperation among stakeholders on implementing local food program or Gema Sabuk Amang (Babel)</li> <li>- To protect local food from imported food (Kalbar)</li> <li>- To support people's innovation and creativities on developing local food menus (Kaltara)</li> <li>- To inform local food research conducted by the research centre and university to society (Gorontalo)</li> </ul>

Table 1. 2. Structural dimension of Indonesia local food policy

Structural Dimension	Java (including Bali and NTB)	Outer Java
Roles	<ul style="list-style-type: none"> <li>- Roles of SOPD (responsible government unit), industry and private companies, university, PKK, NGOs (DIY, Banten)</li> <li>- Private companies and entrepreneurs (Jabar, Jatim)</li> <li>- <i>Pelopor</i>/Local food Initiator (DIY) (Jatim)</li> <li>- Societies (Jateng, Jatim)</li> <li>- Society roles on planning, area development, research, funding, empowerment, monitoring, build business association, information systems development, and local food guidelines that in line with regional regulations (Bali)</li> <li>- Society roles on consuming and promoting local Balinese products to support its marketing (Bali)</li> </ul>	<ul style="list-style-type: none"> <li>- <i>Pelopor</i>/Local food Initiator (Jambi, Babel, Sulbar)</li> <li>- Private company and businessmen/businesswomen (Babel, Sulbar)</li> <li>- Society roles for example industry and private companies, professional organisations, university, PKK, NGOs (Jambi)</li> <li>- To develop local food production, processing, trading, and distribution (Kaltara)</li> <li>- To provide local food buffer (Kaltara)</li> <li>- To consume local food daily (Kaltara)</li> <li>- To prevent local food problems (Kaltara)</li> <li>- To socialise and promoting local food (Kaltara)</li> <li>- Children role as an agent of change (Sulteng)</li> </ul>

Table 1. 3. The Constitutive dimension of Indonesia local food policy

Constitutive Dimension	Java (including Bali and NTB)	Outer Java
Considerations of some of the organisations	<ul style="list-style-type: none"> <li>- To create food security to improve human resources quality and protecting natural resources (Jabar, Jatim, NTB)</li> <li>- To enhance physical endurance and nutrition for schools children (DKI)</li> <li>- To achieve society quality of life (DIY)</li> <li>- To provide local food supply and demand leverage (Banten)</li> <li>- For society welfare (Bali)</li> </ul>	<ul style="list-style-type: none"> <li>- To diversify local food consumption based on local potent (Jambi, Babel, Sulteng, Maluku)</li> <li>- To provide leverage and support on developing local food (Kaltara, Maluku)</li> <li>- To provide knowledge, habit and culture on consuming local food (Gorontalo, Maluku)</li> <li>- To optimise local food potent (Kaltara)</li> <li>- To create food security to improve human resources quality and protecting natural resources (Sulbar)</li> <li>- To preserve local food from extinction (Maluku)</li> </ul>

From the goal as representative of the normative dimension, guided by Saldana (Hatch, 2002 cited in Saldaña, 2016, p. 7) to identify the pattern of local food policy, in “Java” group, some provinces have goals of the local food policy. Firstly, or as examples of DIY, Jabar, Jateng, Jatim, and Banten, the provincial governments have a policy goal to consume a variety of food based on local potent. These kinds of food could hopefully fulfil safety and healthy eating, as they mention in their policy documents. Secondly, the government’s aim to achieve the target of a food diversification index (pola pangan harapan). Third, some provincial governments (for example, in Jateng and Bali) also aim to maintain the supply of local food and provide these kinds of food with an affordable price for the citizens. Fourth, another concern is in reducing rice consumption (for example, in Jabar and Jateng).

In “outer Java” group, meanwhile, there are selected goals, firstly to diversify local food consumption based on the availability of local potent, for example seen in the policy documents of Sumbar, Babel, Maluku, Kalbar, Kaltara, Sulbar, and Sulteng. Secondly, it is also an urgent policy to change people habits to increase consumption of local food, for example seen in

Kaltara, Gorontalo, Maluku, and Babel. Third, providing local food with affordable price is also one aim of provinces in “outer Java” group, as seen in Kalbar, Maluku, and Kaltara. Fourth, food security is mentioned as an aim of local food policy, for example for Kalbar, Gorontalo, and Maluku. Fifth, some provincial governments pay attention to trade and distribution of local food, for example as seen in Maluku and Sumbar. Lastly, some governments, for example Kalbar and Maluku, have a concern about protecting local food varieties.

For the actors who has roles in local food policy to represent the structural dimension of policy, there seem no differences between “Java” and “outer Java” groups. The provincial governments concern themselves about active roles of their government units. They also invite other groups such as industry groups, private companies, universities, and NGOs who have a position as a local food initiator, and also a group of mothers in a neighbourhood community, called PKK or family welfare empowerment (Hanis & Marzaman, 2019).

The last aspect is the consideration of some of the organisations, representing the constitutive dimension. In “Java” group, for example, one concern regarding local food is food security. The food security policy has aimed to protect local natural resources and to support citizens’ needs on local food. In “outer Java” group, meanwhile, the governments consider the utilisation of local food in the local area to diversify local food consumption, as seen in the food policies of for examples Jambi, Babel, Sulteng, and Maluku. Another consideration on the economic leverage is found in some food policy documents, for example in Kaltara and Maluku. Lastly, the education is also essential. Some provinces, for example Gorontalo and Maluku point out the educational purpose to support people's knowledge, habit, and culture on consuming local food.

## **1.5. RESEARCH PROBLEMS AND RESEARCH QUESTIONS**

The previous section of this chapter has discussed Indonesia local food policies at the Central and Provincial government level, particularly concerning on diversification. Overall, this dissertation focuses mainly on the production sector (Chapters 2, 3, and 4) and also on the marketing sector in Chapter 5. A previous study, for example, explains how local food activity relates to local food production and marketing (Ricketts Hein et al., 2006). This dissertation focuses on local food activity in the regional context and at the community level of women farmers group and farmers market in Yogyakarta Special Province.

To the best of my knowledge, from a regional analysis perspective in Chapter 2 and 3, previous studies have conducted a spatial analysis of the local food index (Benedek & Balázs,

2016; Ilbery et al., 2006; Ricketts Hein et al., 2006; Watts et al., 2011), however it is needed to add an agroecological perspective based on the biophysical characteristics (Benedek & Balázs, 2016) (see Chapter 2). The study of poverty, food insecurity, livelihood, and local food potentials from the spatial perspective is limited (see Chapter 3). Turning to the community perspective in rural (Chapter 4) and urban areas (Chapter 5), previous researches in Indonesia that has focused on Women Farmers Groups (WFG) or *Kelompok Wanita Tani* can be grouped into several topics: women and income, participation, local food development, and WFG empowerment. However, what kind of critical issues arise from WFG activities and experiences of managing local food is needed to be explored (see Chapter 4). In Chapter 5, Farmers Markets (FMs) are still small in scale in Indonesia, and a better context should help to fill the urgent need for research on FMs in developing countries (Chiffolleau, 2009). Regarding the meaning of local, as noted in Chapter 5, Eriksen (2013) argues that “there is no consistent definition of ‘local food’” (p. 49), but defines local food on the basis of three types of proximity: geography, social relations, and values. Other definitions have been offered by Granvik, Joosse, Hunt, and Hallberg (2017) in Sweden, and by Tchoukaleyska (2013), who examined these concepts in France’s FMs. Connell, Smithers, and Joseph (2008) discuss how “good food” means various things to their interviewees at FMs in British Columbia, Canada, but the meanings share two basic aspects: a local theme and health-related issues.

A fundamental question for this dissertation is whether local food represents a remained tradition that will soon be replaced by national or global food, or an alternative to the conventional national and/or global food. Operationally, this main research question is divided into several research questions that are questioned in following chapters.

Research question 1: where local food potentials are distributed at the regional level concretely in Yogyakarta Special Province?

Research question 2: how these are related to the agro-ecologies that are representing the local nature conditions?

Research question 3: to what extent rural communities are deprived concerning the level of poverty and food insecurity?

Research question 4: how the local food potentials determine the rural deprivation?

Research question 5: what kinds of critical issues appear to the producing actors in the rural villages?

Research questions 6: how these issues are interrelated to their everyday experiences and practices, taking a case of the women farmers’ group activities?

Research question 7: what meaning of localness of the products do the participants construct at their practices in farmers' markets in the city of Yogyakarta?

Research question 8: what kind of mechanism is in the farmers' markets related to the participants' motives?

In Chapter 2, research questions 1 and 2 are addressed related to the importance of local food on the regional scale. In Chapter 3, research questions 3, and 4 are raised related to the issue of local food, poverty, food insecurity, and livelihood. Turning to the community perspective, in Chapters 6 and 7 the last four research questions are addressed. Therefore, the main purpose of this dissertation is to examine the meaning of local food based on the current situation of local food activity in Yogyakarta Special Province.

## **1.6. APPROACHES OF THIS DISSERTATION**

According to Peters (2017, p. 24), an approach is a researcher's "way of knowing the world". To know the world, a researcher needs to identify what theories are suitable for his/her research, then to formulate the research questions, and choose appropriate methods to address the research questions, and to analyse the data (K. Peters, 2017). This dissertation employs three approaches to answer the research questions: meanings, resources, and activities. To identify the meanings of local food, I use discourse analysis (for example N. Phillips & Hardy, 2002). Then, for analysing local food resources and activities, I employ the mapping technique helped by a Geographical Information Systems (GIS) software, namely QGIS (Benedek & Balázs, 2016; Ilbery et al., 2006; Ricketts Hein et al., 2006; Watts et al., 2011). Other methods for local food resource analysis are presented in Chapter 2 and 3. The third approach regarding activities, I employ the Thematic Network Analysis helped by MAXQDA software in Chapter 4 (Attride-Stirling, 2001, see Chapter 5 for other references). For Chapter 5, I also employ discourse analysis to analyse the transcribed text to describe the actors practices (N. Phillips & Hardy, 2002).

## **1.7. BRIEF OVERVIEW OF TARGET AREA**

This section shows the regional profile of Yogyakarta Special Province (Figure 1.7). In addition, the reasons why Yogyakarta Special Province is chosen as the target area are explained. Administratively, Yogyakarta Special Province consists of four regencies (Sleman, Gunungkidul, Bantul, and Kulonprogo) and one municipality (Yogyakarta). In 2017, the population of the province was 3,762,167 and that of the capital city, Yogyakarta, was 422,732

(Badan Pusat Statistik Provinsi Daerah Istimewa Yogyakarta [BPS DIY], 2018). For Chapter 2, the research is conducted in Yogyakarta Special Province. For Chapters 3 and 4, the research is located in Kulon Progo Regency. For Chapter 5, the study is conducted in Yogyakarta, a city in Java, Indonesia. The study is also located in Sleman Regency for Chapter 5. The area is well known for tourism, educational institutions, and multicultural characteristics (Zudianto, 2010). The development of Yogyakarta's urban areas during the last decade has created a metropolitan area known as *Kawasan Perkotaan Yogyakarta (Agglomerasi Perkotaan Yogyakarta)* which is the second-fastest-growing metropolitan area in Indonesia after the Greater Jakarta Metropolitan Area (Legates & Hudalah, 2014; Pemerintah Provinsi Daerah Istimewa Yogyakarta, 2010). Yogyakarta is the second most popular international tourist destination in Indonesia after Bali (Hampton, 2003).

There are some reasons why Yogyakarta Special Province is chosen as the research location. First, as noted in Chapter 2, Suryana (2016) notices difficulties in obtaining any data of plantation and production of local food for his analysis. Fortunately, for the most area of Yogyakarta Special Province, the BKPP DIY has a local food database. Then the information provided in the database is employed, in which local food is operationally defined as non-rice carbohydrate crops (Khudori, 2008).

Second, as noted in Chapter 3, Indonesia is one of developing countries, and some areas are prone to poverty and food insecurity, especially in Yogyakarta Special Province. According to various digital and paper-based mass-media reports, until 2016 twenty villages in Yogyakarta Special Province have been recorded as the category of severe on food insecurity (Bisnis.com, 2016; Sindo, 2016; Solopos.com, 2016). Kulon Progo, as a part of Yogyakarta Special Province, faces the most severe condition of food insecurity compared to other regencies within this area in 2015. The Yogyakarta Special Province for Food Security Agency and Extension (*Badan Ketahanan Pangan dan Penyuluhan/BKPP DIY*) officially publishes the classification of food insecurity villages.

Third, as noted in Chapter 4, in Yogyakarta Special Province, particularly in Kulon Progo Regency, the government has suggested the people to consume local food to reduce the rice consumption (Sutarmi, 2018). Moreover, the head of Food and Counseling of Kulon Progo Agriculture Office explains that local food such as tubers has advantages in terms of replacing rice because of its carbohydrate ingredients (Sutarmi, 2018). Local food utilisation has been managed by farmers groups and WFGs (Sutarmi, 2018). Moreover, according to Maman Sugiri, head of Kulon Progo Food Security and Forestry, Fisheries and Agriculture Counselling, his

office has advocated that WFGs prepare food based on local food ingredients (Sutarmi, 2016). This suggestion is supported by the government instruction since 2009 to cook local food as a snack during government meetings (Bupati Kulon Progo, 2009; Sutarmi, 2014). However, for example a previous research has recognised two main issues of the local food production in Kulon Progo: first issue is policy and structural factors and second issue is technical factors (Raden Rijanta, Widiyanto, Toekidjo, & Sulistyani, 2013). Moreover, Rijanta et al. identified six structural and nine technical factors. One key structural factor is difficulty “to link policy and practices” (Raden Rijanta et al., 2013, p. 103).

Fourth, as noted in Chapter 5, the first FM was most likely initiated on 16 December 2006 in Bali (Ubud Organic Market, n.d.). According to my interviewees (in Chapter 5), the second group of small community market initiatives started in Yogyakarta in 2012, and another community market was established in Bandung about two years later (Dwiartama, Tresnadi, Furqon, & Pratama, 2017).

## Map of Indonesia Archipelago

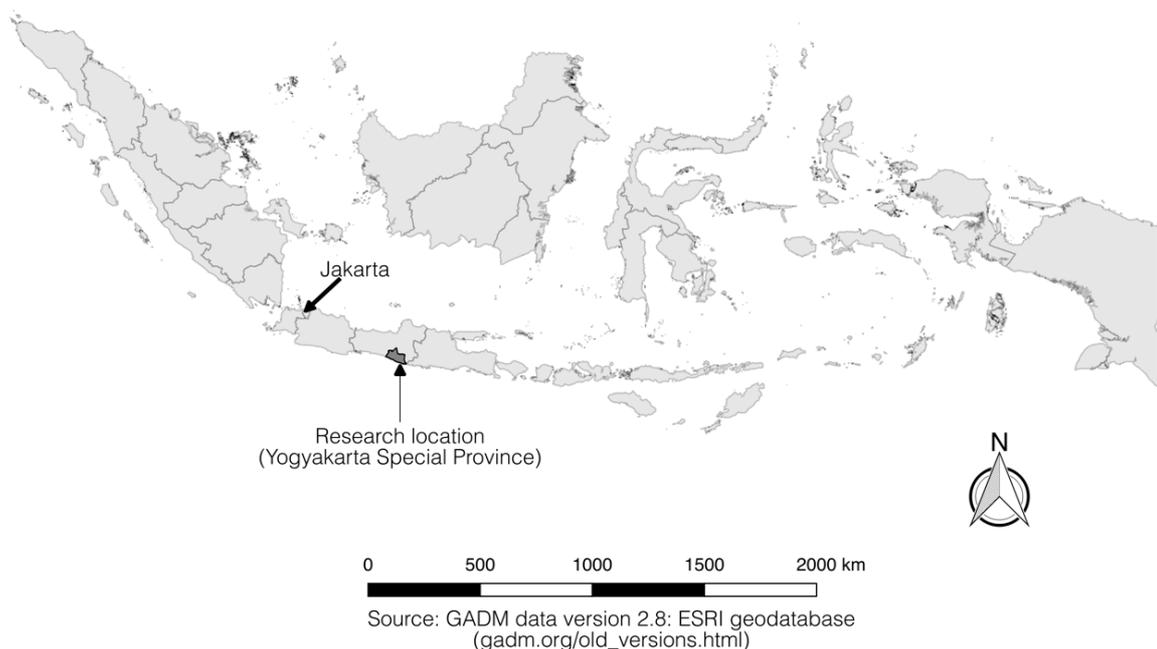


Figure 1. 7. Yogyakarta Special Province in Indonesia Archipelago.

## **1.8. STRUCTURE OF DISSERTATION**

This dissertation consists of six chapters, including this introduction. In the following parts, Chapter 2 is, based on my published paper (Widiyanto, 2019a), about spatial relations between local food potentials and agroecology in DIY by using GIS at the regional level, in searching for where local food potentials are distributed in an extended areas, why these are concentrated in particular areas. Chapter 3 is, also based my published paper (Widiyanto, 2018), still discussing spatial patterns of local food but exploring the issue of local food and food insecurity, focusing on one regency named Kulon Progo in DIY. This chapter offers a description of rural deprivation taking an example of local food and its related issues of poverty, food insecurity, and livelihood.

Tuning to the local scale, then, Chapter 4 focuses on the production side of local food in selected woman farmers' groups in rural Kulon Progo, especially discussing discursive process of meanings of local food in the groups' activities and practices. Chapter 5, based on my published paper (Widiyanto, 2019b), takes an example of an alternative kind of farmers' markets in the city of Yogyakarta. This chapter discusses the connectivity between localness and healthiness of local food, paying attention to three aspects of geographical proximity, social relation and value. The topics and issues that each of these empirical studies addresses are specifically different from each other, and therefore, each of them has literature reviews within its theoretical extent. Finally, Chapter 6 provides a concluding discussion of this dissertation, including an overview of the findings and some recommendation regarding local food policies in Indonesia, followed by the reference table.

# **CHAPTER 2**

# **CHAPTER 2. LOCAL FOOD POTENTIALS AND AGROECOLOGY IN YOGYAKARTA SPECIAL PROVINCE**

## **2.1. INTRODUCTION**

### **2.1.1. Background**

According to the data from Badan Ketahanan Pangan Kementerian Pertanian (Food Security Agency of the Ministry of Agriculture), Kompas reports that Indonesia stands for the second richest country for the food potentials due to the availability of 77 types of carbohydrate-food crops, 75 kinds of fat, 26 types of nuts, 389 fruits, 228 types of vegetables and 110 kinds of spices (Kompas, 2018). However, even though Indonesia has various food resources, rice is the most favoured food choice compared to others (Sumedi & Heriawan, 2016). The Indonesian long-term habits of rice consumption will not easily change because of Indonesian cultural and psychological perspective (Sumedi & Heriawan, 2016). It is common that most the Indonesian felt not to meal if they do not eat rice (M. Gardjito et al., 2013).

According to Rahardjo and Ritohardoyo (2002), most Indonesian depend on rice not only for their staple food but also their livelihood. Moreover, Rahardjo and Ritohardoyo explain that the rice dependency causes several problems on the food systems, such as on the production, consumption, distribution, monitoring, estimation and data validity (Rahardjo & Ritohardoyo, 2002). *Harian Jogja* (a regional newspaper) reports that rice production is abundant in Yogyakarta Special Province (Daerah Istimewa Yogyakarta, hereafter DIY) (Mustika, Sunartono, & Saraswati, 2017). However, Food Security Agency & Extension DIY (BKPP DIY) calculates that there is a decline in rice production and increase in rice consumption during the last five years (Mustika et al., 2017). Following the trend of DIY's rice production and consumption, and using information provided by BKPP DIY, Mustika et al. estimate that by 2027 the DIY's rice production will not be adequate to fulfil the inhabitants rice consumption (Mustika et al., 2017). The gap between rice production and consumption in DIY will perhaps bring about a food crisis in 2037 based on BKPP DIY prediction (Kedaulatan Rakyat, 2017). In order to avoid food insecurity, malnutrition or food crisis, BKPP DIY offers a food diversification strategy (Kedaulatan Rakyat, 2017; Mustika et al., 2017; *Tribun Jogja*, 2017). Therefore, providing food backup is necessary to anticipate a lack of food supply. In the past, indeed, the Javanese planted cassava as food backup (Nawiyanto, 2003). Jhamtani described some cases of food insecurity and malnutrition due to various factors, such as climate

change, lack of food access and lack of staple food alternatives (Jhamtani, 2008). As these alternatives, local food that is primarily defined as non-rice staple food is increasingly important.

Gardjito (2017), an Indonesian expert of local food and gastronomy, proposed a term: “triple burden”. For my interview, she points out: 1) most people pay less attention or neglect the local food potentials, 2) there is no or lack of institutional data of local food, and 3) less information leads to difficulties for the central and/or regional government to design policies regarding local food. She explains that local food has a “hidden” potential. The terms of hidden potential are translated from *potensi tersembunyi* (Indonesian words) where local food is usually neglected compared to rice (as the main staple food in Indonesia).

Why is local food neglected? How to answer this question can be identified from the policy and technical constraints (Raden Rijanta et al., 2013) and the Indonesian (local) food culture (Simatupang, 2016; Sumarno, 2016). The second issue is the availability of local food data. Erwidodo (2016) states a difficulty in collecting local food data particularly from a locality dimension. In particular, Suryana (Suryana, 2016) mentions the lack of quantitative data for local food. The lack of accuracy of data consequently causes difficulty in providing a piece of valid information.

Following the “triple burden” idea, local food is seen as having a “hidden potential” through the lenses of food availability in Indonesia. As for why studying local food from the geographical perspective is important, following Jean-Luc Maurer, a professor of development studies, Rotgé (2000) reviews the rice agricultural modernisation programme in DIY and gives an analysis that the geographical location and the agroecological types supports economic security of the local inhabitants. Following Rotgé’s arguments (Rotgé, 2000), first of all, this study identifies the location of the local food potentials in order to explore where they “hide”. For details, the main research question of this study is where the local food potentials are distributed in DIY. The main research question is then expanded into whether local food potentials concentrate in the particular places or disperse in the wider area of DIY, and how these patterns of local food potentials are related to the local geographies.

This chapter attempt to contribute to the geography of local food systems studies, focus on two perspectives of production and spatial (Reid, Gatrell, & Ross, 2012/2016a, 2012/2016b). Four dimensions of planted area, harvested area, production and land productivity shows the production perspective. The spatial distribution of the local food potentials based on the index calculation (known as Index of Food Relocalisation/IFR) explains

the spatial aspect. Previous research identified that the IFR application less considers on local food systems and biophysical discussion (Benedek & Balázs, 2016). This chapter attempts to fill the research gap by adding an agroecology discussion to show the biophysical characteristics of the research area.

### **2.1.2. Towards a local food index**

Previous researches offered an answer on how to portray local food mainly through spatial analysis through constructing an index. The initial work of local food mapping was conducted by Ricketts Hein, Ilbery, and Kneafsey (2006). Their work resulted in the “Index of Food Relocalisation” (IFR), referring to Paul Knox's formula (Knox, 1974), which is constructed from producing and marketing sub-Index and derived from six indicators (Ricketts Hein et al., 2006). They applied their index in sixty-one counties of England and Wales and showed a different pattern between rural and urban counties, the pattern which showed scores depending on the underlying factors in the particular county such as physical, cultural, tourist and/or economic characteristics. The second previous literature finds the spatial concentration of local food activities by comparing two regions in England (Ilbery et al., 2006). Then, the IFR application attracts Watts, Leat, & Revoredo-Giha (2011) to employ the index in the context of Scotland by using five categories: location, business activities, product designations, membership of industry or cooperative organisations, and the sources in which the enterprise is listed. The latest paper of Benedek and Balázs (2016) develops the IFR or FRI (Food Relocalization Index) in their notion, as a production sub-index into a composite index called “Policy Intervention for Food Relocalization Index (PIFRI)” that are taken in the twenty counties of Hungary.

This chapter tries to adopt the index (IFR) in order to study local food aspect in DIY. According to Isma'il, Badan Ketahanan Pangan, and Fakultas Teknologi Pertanian, Universitas Jember (as cited in Suryana, 2016), there are various definition of local food in Indonesia. The official definition is from Law of Food or Undang Undang No 18 Tahun 2012 (Rachmat & Syakir, 2016; Suryana, 2016). However, some scholars operationally employ different definitions based on used data (Erwidodo, 2016; Suryana, 2016). Because of data availability, it is quite difficult to apply the same variables in the context of DIY as used in the previous studies (Benedek & Balázs, 2016; Ilbery et al., 2006; Ricketts Hein et al., 2006; Watts et al., 2011). As mentioned in terms of “triple burden” (Moerdijati Gardjito, 2017), in Indonesia, it is difficult to obtain suitable data to analyse local food (Erwidodo, 2016; Suryana, 2016). Suryana

(2016) notices difficulties in obtaining any data of plantation and production of local food for his analysis. Fortunately, for the most area of DIY, the BKPP DIY has a local food database. Then the information provided in the database are employed, in which local food is operationally defined as non-rice carbohydrate crops (Khudori, 2008).

This chapter uses four aspects of local food production: planted area, harvested area, production amount and land productivity all provided by the BKPP DIY (Badan Ketahanan Pangan dan Penyuluhan Daerah Istimewa Yogyakarta [BKPP DIY], 2012). These four categories of statistic variable are commonly provided in the agricultural statistical publications that are provided by the official agencies of Indonesia government, for example, Statistik Pertanian 2017 (Pusat Data dan Sistem Informasi Pertanian Kementerian Pertanian Republik Indonesia, 2017). From the definition provided by Statistics Indonesia (Badan Pusat Statistik or hereafter BPS) and Ministry of Agriculture of the Republic of Indonesia (Kementerian Pertanian, formerly known as Departemen Pertanian or Deptan), Sanny defines these four aspects (Sanny, 2010): planted area as an area where a particular crop is planted, harvested area as an area where a particular crop is harvested, production amount as weight of the yield of the particular crop from the harvested areas, and land productivity as yields of a particular crop per area.

### **2.1.3. Biophysical and economic consideration**

According to the experience of Benedek and Balázs (2016), the IFR gives an advantage of mapping local food and assisting a planning program of the rural inhabitants. However, they also point out two limitations of the IFR particularly concerning the biophysical aspect and the local food system issues (Benedek & Balázs, 2016). This chapter attempts to elaborate the broader method of local food mapping by adding the ZAE analysis as representing the biophysical aspect.

Concerning the agricultural development, the Research and Development Unit of the Ministry of Agriculture provides the map of Zone of Agro-Ecology (ZAE). This map gives two important information: 1) the agricultural zone system based on the regional characteristics and 2) the regionalisation of prospectus commodity crops following the land suitability in order to support agriculture development planning (Sutriadi, Sudarmaji, Iswadi, & Prasajo, 2013). In the context of DIY, the map system includes agriculture and non-agriculture zones. According to the agro-ecological zone calculation of Sutriadi et al. (Sutriadi et al., 2013), DIY has 91.36% of the agricultural area and 8.64% of the non-agricultural area. Following their detail division,

the DIY's agricultural zones are categorised into zone II, III and IV, and further grouped into IIIaq, IIIax, IVaq and IVax subzones, implying the suitability for distinct farming activities (Sutriadi et al., 2013). They explain that the IIIaq and the IVaq subzones are suitable for wet paddy, and meanwhile the IIIax subzone is for rubber, coconut, palm oil, robusta coffee, pepper, vanilla, stink bean (*petai*), starfruit, jackfruit, *duku*, *durian*, guava, orange, mangosteen, corn, soybean, green bean, peanuts, cowpea, sweet potato, cassava, banana (Sutriadi et al., 2013). Lastly, the IVax subzone is suitable for dry paddy, corn, green bean, peanuts, cowpea, sweet potato, cassava, tobacco, red onion, palm chilli (Sutriadi et al., 2013).

The National Development Agency (Bappenas) proposes the four concepts of regional development based on: 1) character, 2) spatial or regional planning, 3) integrated development, and 4) cluster development (Setiyanto & Irawan, 2015). Moreover, for the development goals, Setiyanto and Irawan (2015) deploy the concept of regional agricultural commodity development. If a suitable commodity crop is planted based on the agro-ecological zone system, optimum benefits is expected, increasing the productivity (Sutriadi et al., 2013). For example, arrowroot can be planted in all the agro-ecological zone (Hermansyah, Murniyanto, & Badami, 2009). However, Hermansyah et al. (2009) argue that it is challenging to develop arrowroot in Madura inland because of no information of its agro-ecology. Another example can be seen in the agroforestry practice in Kulon Progo. Farmers with adaptive ability and knowledge on managing land can take advantages of commodity choices following the local agro-ecological features (Hani, Indrajaya, Suryanto, & Budiadi, 2016). Finally, if farmers could optimise their commodity production, it leads to an increase in their income (Simatupang, 2016).

## **2.2. RESEARCH METHOD**

This chapter focuses the four regencies in DIY, Indonesia (Figure 2.1): Sleman, Gunungkidul, Bantul and Kulon Progo. The city of Yogyakarta is not analysed at this time due to no available data at the village (*kelurahan*) level. This section explains three main stages of the research method: ZAE review, LFI measurement, and SPP (*Survei Pendapatan Rumah Tangga Usaha Pertanian*) calculation (Figure 2.2).

The first stage is to review the ZAE map. In the previous part of this chapter, it is pointed out that DIY has four sub-zones of agricultural area, namely IIIaq, IIIax, IVaq and IVax. The main purpose of this chapter is to find out the spatial concentration of local food and therefore the analysis pays attention to IIIax and IVax which show the suitability for annual or

food crops and for food crops, respectively, both as commodities including cassava and sweet potato that are representative of DIY's local food crops, comparing to other subzones (IIIaq and IVaq) that are potentially suitable for wet paddy (Sutriadi et al., 2013). Each village is given four classifications: the notion 1, 2, 3, or 4 based on the spatial relation to the ZAE system. The notion 1 means that in the villages there is neither subzone IIIax nor IVax. The notion 2 reflects that the villages have the IIIax subzone. The notion 3 means that the villages have the IVax subzone. The notion 4 shows that the villages see both IIIax and IVax subzones in their areas.

To calculate the local food index (LFI) is the second stage of this study. In order to answer the first research question. This chapter uses LFI as the index's name rather than Index of Food Relocalisation (IFR) that many previous researches have used, due to the local food parameters that this chapter analyses. In total the analysis includes 393 villages: 86 villages in Sleman, 144 villages in Gunungkidul, 75 villages in Bantul and 88 villages in Kulon Progo. The primary data source is the Local Food Database from the BKPP DIY in 2012 (Badan Ketahanan Pangan dan Penyuluhan Daerah Istimewa Yogyakarta [BKPP DIY], 2012). The data source contains four leading indicators of main food crops (Noorjenah et al., 2015): planted area (ha), harvested area (ha), land productivity (Kwintal/ha) and production amount (metric ton).

For Sleman, Gunungkidul, and Bantul, the database gives information of eleven local food crops: cassava, sweet potato, edible canna, arrowroot, prasina, birch rim yam, pumpkin, taro, tuber, breadfruits and elephant's foot. However, for Kulon Progo, the database only provides ten local food crops, excluding taro. In this chapter, the values of ten crops that are available in all the regencies are read from the hardcopy of the local food database report, and inputted manually into Microsoft Excel.

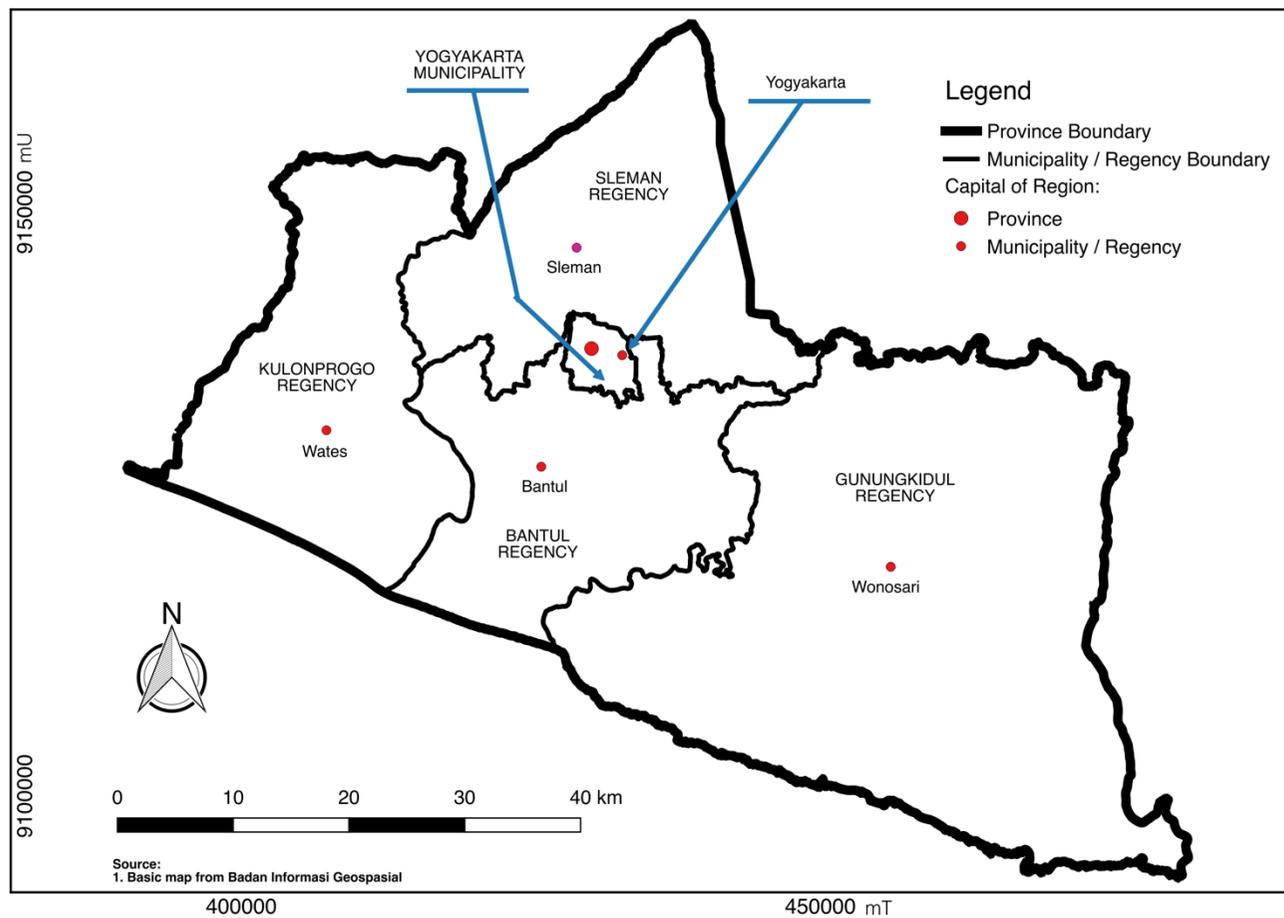


Figure 2. 1. The administrative map of Yogyakarta Special Province (Source of map from Geospatial Information Agency or Badan Informasi Geospasial).

The IFR formula that Ricketts Hein et al. (2006) first proposed is  $IFR = 100 \frac{R_j}{NC} \cdot R_j$  showing the sum of each indicator for the village  $j$ . N is the number of indicators and C is the number of villages in a regency. Less score shows the highest index. In this chapter, the IFR formula represents the sub-Index. Then, to provide the Local Food Index (LFI), this chapter follows the formula of Ricketts Hein et al.(2006), proposing  $LFI = (\text{sub-index (IFR) A} + \text{sub-index (IFR) B} + \text{sub-index(IFR) C} + \text{sub-index(IFR) D})/4$ . Alternatively, the LFI formula is  $\frac{\Sigma IFR}{4}$ .

This chapter adopts the index measurement proposed by Knox (1974) but employs different variables that show local food in the local context and which reflect four categories to produce four sub-Index as mentioned above namely: planted area, harvested area, land productivity, and production amount. Following Ricketts Hein et al., all of these four sub-Index results in the Local Food Index (“IFR”). This chapter adopts the IFR measurement of Benedek and Balázs (2016). Due to the dissimilar availability of the local food indicators in the database as mentioned above, this chapter analyses ten indicators in order to provide the maps of local food (potential) index for DIY.

Next, the local food index are drawn into the rank of each village in the study area, using the "rank function" provided in Microsoft Excel. Niels Weterings via his helpful website, [www.excel-easy.com](http://www.excel-easy.com), provides detail steps for ranking the data (Easy, n..d). Secondly, after each village gets rank in each indicator value, all the rank from those indicators are summed up for each sub-Index. In other words, the sub-Index value is the total rank from all indicator ranks (R<sub>j</sub>). Following the explanation of Benedek and Balázs (2016), smaller rank shows better condition in the resulted maps (the sub-index and LFI map). Operationally, there are several villages with no data, 152 villages in the study area (Figure 5B). The treatment for the villages without data or the villages that contain 0 value in the sub-Index maps (Figure 2.4) is to exclude them from creating the LFI map. So, the highest value for the LFI is seen at the village with 6.40 value. For classification of the villages, rather than following the previous research using the quartile interval (Benedek & Balázs, 2016; Knox, 1974), in this chapter the equal interval is shown following the result of the QGIS calculation of the original measurement (score). The spatial pattern analysis is taken by widening the previous Lyson’s (2004) research that focuses on the top ten regional analysis, taking account for the top fifty villages.

The next results are provided by two sets of analysis to answer why the LFI concentrate in those particular regions. The first subsection of analysis is conducted by using a cross-

tabulation matrix to show the typological correspondence of each quartile of the LFI scores and the agro-ecosystem zones.

A cross-tabulation matrix is a method that usually used to analyse land use change (Cuba, 2015; Nourqolipour et al., 2016; Pontius & Petrova, 2010; Pontius, Shusas, & McEachern, 2004). Initially, for the land use change analysis, a cross-tabulation matrix is set the two-time interval (Batisani & Yarnal, 2009; Pontius et al., 2004; Versace, Ierodionou, Stagnitti, & Hamilton, 2008), using two variables in the row and column in two different periods of land use categories (Pontius et al., 2004; Wang, Cheng, & Chen, 2011).

In this chapter, on the row the variables of the selected ZAE zones are placed. The data of Zone Agro-Ecology (ZAE) map includes four zones and eight sub-zones in detail: Ilaq, Iiax, Iibx, Iicx, IIIaq, IIIax, IVaq, and IVax (Sutriadi et al., 2013). Moreover, Sutrialdi et al. (2013) explain that the zones of I-IV are appropriate for forest plantation, annual crops, annual or food crops, and food crops, respectively. Then, the analysis is continued by the map-overlay technique of the DIY village administration and the agro-ecosystem maps, following previous Musyafak's (Musyafak, 2015) method in order to gain what percentage of the ZEA zones are in each village. For the ZAE zones, each village is given one of four classifications based on its relation to the two selected sub-zones of the ZAE system (IIIax and IVax), as explained in the first step of this section. The result is presented in the Table 2.2.

The second subsection to analyse the concentration pattern is to identify the income levels resulted from the agricultural activities. There is a question whether economic motives are related to the farmers' choices to plant paddy or *palawija* (second crop). However, due to the lack of available data, this chapter analyses farm households' income from paddy and second cultivated crops at the subdistrict (kecamatan) level not at the village level. The data are derived from the Income Survey from Households' Agricultural activities or Survey Pendapatan Rumah tangga Usaha Pertanian 2013 (SPP, 2013) of the BPS (Badan Pusat Statistik [BPS], 2013). Two kinds of the average income are available: one from wet and dry paddy cultivation and the other from second commodity crops, including: maize, soybeans, peanuts, green beans, cassava, sweet potato, sorghum, taro, edible canna (*ganyong*), and arrowroot (*irut*). There are 6035 selected households as the sample, consisted of 1303 households in Kulon Progo, 1531 households in Bantul, 1780 households in Gunungkidul, and 1421 households in Sleman, respectively. In order to obtain information of the average household income this chapter follows the previous research of Firani (2011) that provide a formula to calculate the average total income in a particular region (sub-district). Then, the classes of

average income (from very high to very low) are identified for each sub-district, and drawn into the map. This map is again spatially based on the data of sub-districts at the one-level higher than a village (*desa*) in the Indonesia administrative structure. Therefore, this chapter tries to identify the spatial pattern and then to give descriptions. To sum up, the research process is presented in a research diagram below (Figure 2.2).

## **2.3. RESULTS AND DISCUSSION**

### **2.3.1. Results**

The landscape of agro-ecologies in DIY are grouped into agriculture and non-agriculture zones (Sutriadi et al., 2013). The IIIax and IVax sub-zones, representing the perennial and food crops, are mainly concentrated in the middle part of Gunungkidul regency, some seen dispersedly in the north part of Sleman and the western part of Kulon Progo regencies. Meanwhile, the IIIaq sub-zone, indicated by the green colour, is suitable for wet paddy commodity and concentrates in Kota Yogyakarta, some part of Sleman and Bantul regencies, and some area at the southern part of Kulon Progo.

The local food index is composed of the maps of the four sub-index (Figure 2.4). The villages with very high and high scores (very high scores correspond to the darkness green colour for example in Figure 2.5B, and while the high scores correspond to the second upper darker green colour) in terms of the planted area sub-index (Figure 2.4A) are distributed in all the regencies, but ones of very high score are concentrated in two regencies: Gunungkidul and Kulon Progo regencies. Meanwhile, in Gunungkidul, the very high and high scored villages are concentrated in the northern and south-eastern part of Wonosari (the capital of Gunungkidul), while in Bantul, the villages with a relatively very high and high score of this sub-index are distributed in the eastern and western part, adjacent to other neighbouring regencies: Gunungkidul and Kulon Progo. In Kulon Progo, the very high and high scored villages are located in the northern and south-eastern part of the Wates (the capital of Kulon Progo). Finally, in Sleman there are only two villages adjacent to Bantul and Gunungkidul regencies.

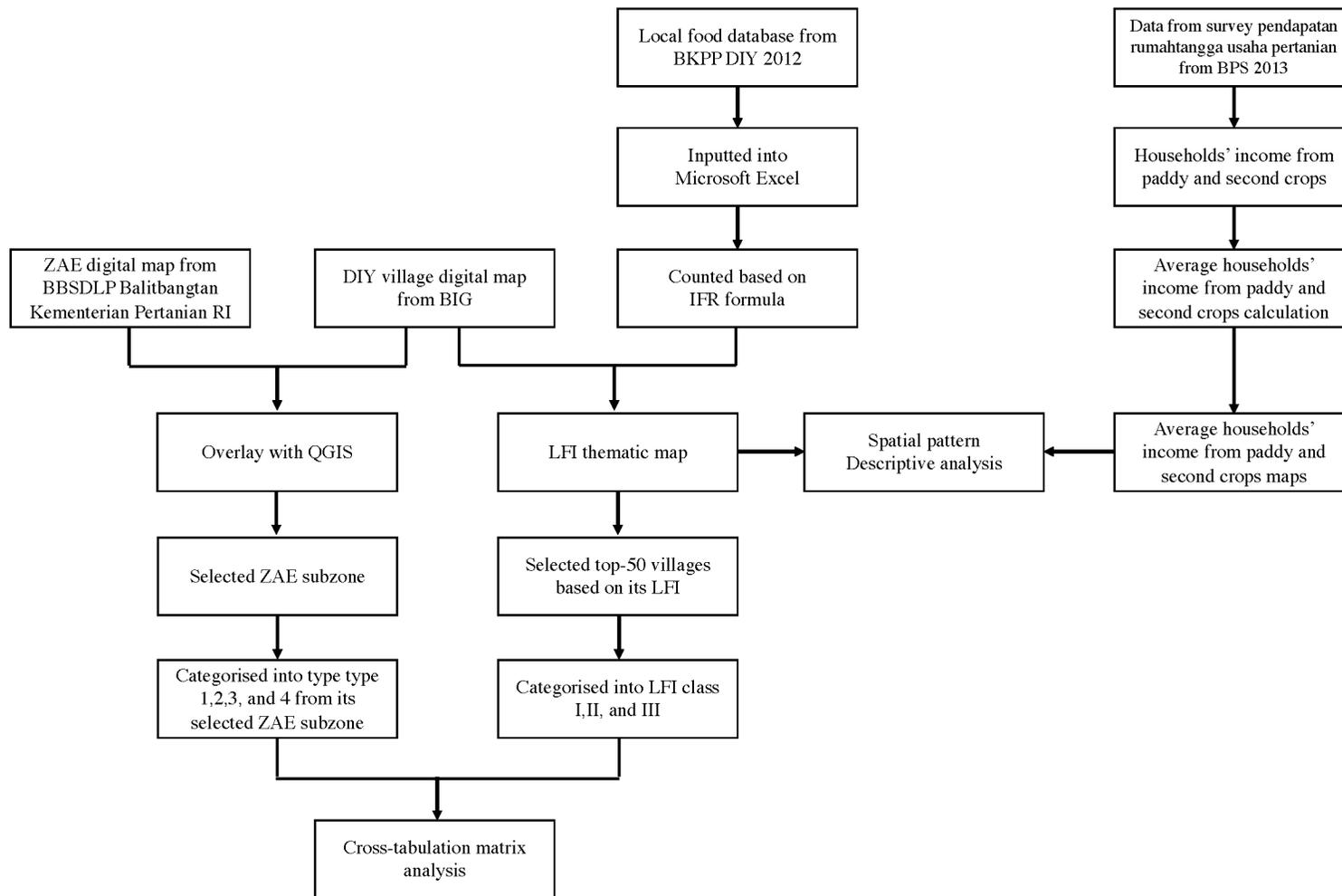


Figure 2. 2. Research diagram

The spatial pattern of the harvested area of local food sub-index (Figure 2.4B) is almost similar to that of the planted area sub-index. The very high scored villages of this sub-index are located in Gunungkidul and Kulon Progo regencies, while the high scored villages are distributed mostly in Gunungkidul, followed by Kulon Progo, Bantul and Sleman. Comparing to the map of the planted area sub-index, there is an additional one village with a very high score in Kulon Progo.

The production amount of local food sub-index (Figure 2.4C) shows that the very high scored villages are distributed in Gunungkidul and Kulon Progo regencies. The high score of this sub-index is seen widely in Kulon Progo, Gunungkidul and Bantul. In Gunungkidul, the villages with very high and high scores are found in the northern part. Meanwhile, in Kulon Progo, the villages with comparative advantages for production amount of local food are found in the eastern and western part. Lastly, for Bantul the high score of this sub-index shows that the villages are located in the north-western part.

The land productivity of local food sub-index (Figure 2.4D) depicts that the very high scored villages are distributed only in Kulon Progo, while the high score of the sub-index is seen in Gunungkidul and Kulon Progo regencies. In Kulon Progo, the villages with high land productivity are located mainly in the western part and some in the south-eastern part of Wates. In Gunungkidul, the villages with high sub-index score are found in the northern part.

Finally, for the local food index (LFI) in DIY (Figure 2.5B), there is only one village in Gunungkidul with its very high score, while for the high scored villages are located in Gunungkidul and Kulon Progo. To sum up, this chapter finds that only in two regencies, Gunungkidul and Kulon Progo, as the local food potential compares to others regencies in DIY. In Gunungkidul, the villages that have very high and high scores of the LFI are located in the northern and south-eastern part of Wonosari. In Kulon Progo, the villages with high score of the LFI are found in north-western and south-eastern part of Wates. For Bantul, the villages with high LFI are found in the northwestern and north-eastern parts from Bantul (the capital of the regency).

Table 2. 1. Information explaining agroecology subzone (appendix for Figure 2.3)

Zone/ Subzone	System	Sub system
I	Forestry crops	Non-agricultural crops
IIaq	Perennial crops	Perennial crops dryland Lowland wet climates
IIax	Perennial crops	Perennial crops dryland Lowland wet climates
IIbx	Perennial crops	Perennial crops dryland Medium land wet climates
IIcx	Perennial crops	Perennial crops dryland Highland wet climates
IIIaq	Annual crops/ Food crops	Annual crops/ Food crops Wetland lowland wet climates
IIIax	Annual or Perennial crops/ Food crops	Annual or Perennial crops/ Food crops dryland lowland wet climates
IVaq	Food crops	Food crops wetland lowland wet climates
IVax	Food crops	Food crops dryland lowland wet climates
X3		

Source: translated from Sutriadi et al. (2013, p. 17)

Table 2. 2. The cross-tabulation of top 50 villages based on the LFI scores and the selected sub-zones of the ZAE system

ZAE \ LFI	1			2			3			4			TOTAL
	KP	B	GK										
I			1										1
II	2	2	7			6	5					1	23
III	5	3	11	1		4	2						26
TOTAL	7	5	19	1		10	7					1	50

Source: the author's analysis from the LFI calculation and the ZAE map. Note of abbreviation: KP = Kulon Progo, B = Bantul, GK=Gunungkidul

Table 2.2 shows the distribution of the top 50 villages based on the LFI scores and the selected two sub-zones of the agro-ecological system. They are distributed in three regencies: Gunungkidul, Kulon Progo and Bantul. There is only one village with very high score of the LFI (Class I), and twenty-three villages with high score of the LFI (Class II). Finally, the average score of the LFI (Class III) is supported by twenty-six villages. Meanwhile, the type 1 of the ZAE is supported by 31 villages, while the types 2, 3 and 4 are supported by 11, 7, and one villages, respectively. It can be argued that most the villages (more than half) are located in the areas where are not suitable for cassava and sweet potato (Type 1 of the ZAE). Meanwhile, for Types 2 and 3 11 and 7 villages are located in the area with perennial and food crops, and food crops, respectively, both in low dryland and wet climate. Lastly, for Type 4 that represent the combination of the IIIax and IVax of the ZAE sub-zones is supported by one

village. From Table 2.2, this study finds that the local food is not necessarily located in the suitable area in terms of the local agro-ecologies. Further discussion is needed in the discussing section, particularly to answer why most the local-food producing villages are located not in the suitable area.

As for relations between the spatial patterns of the LFI and farm households' income levels, from Figure 2.5 can identify some findings that the sub-districts of very high and high average income from paddy are concentrated in Sleman and Kulon Progo regencies (Figure 2.5A). In Sleman, the paddy income level is very high found in the sub-districts located in the south-eastern part of Sleman (the capital of the Sleman regency). Meanwhile, in Kulon Progo, the high average income is found in one sub-district located in the southwestern part of Wates. In contrast, the very high and high average income from secondary crops (Figure 2.5C) is spatially distributed mainly around the south-eastern part of Wonosari in Gunungkidul, while the high average income is seen in the south-western part. The next section discusses the relations of the income level, the LFI and the ZAE.

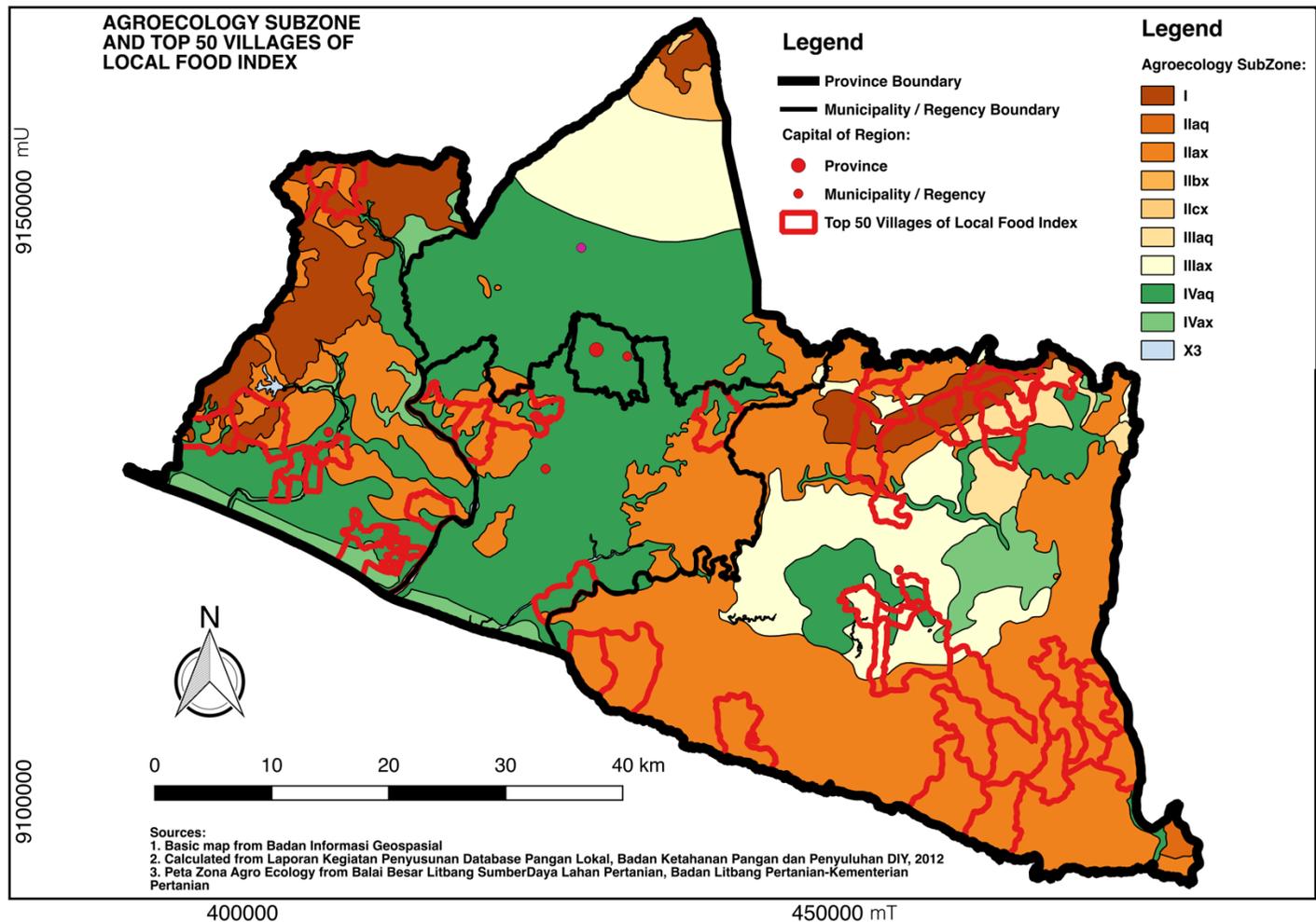


Figure 2. 3. Local food index and agroecology condition in Yogyakarta Special Province.

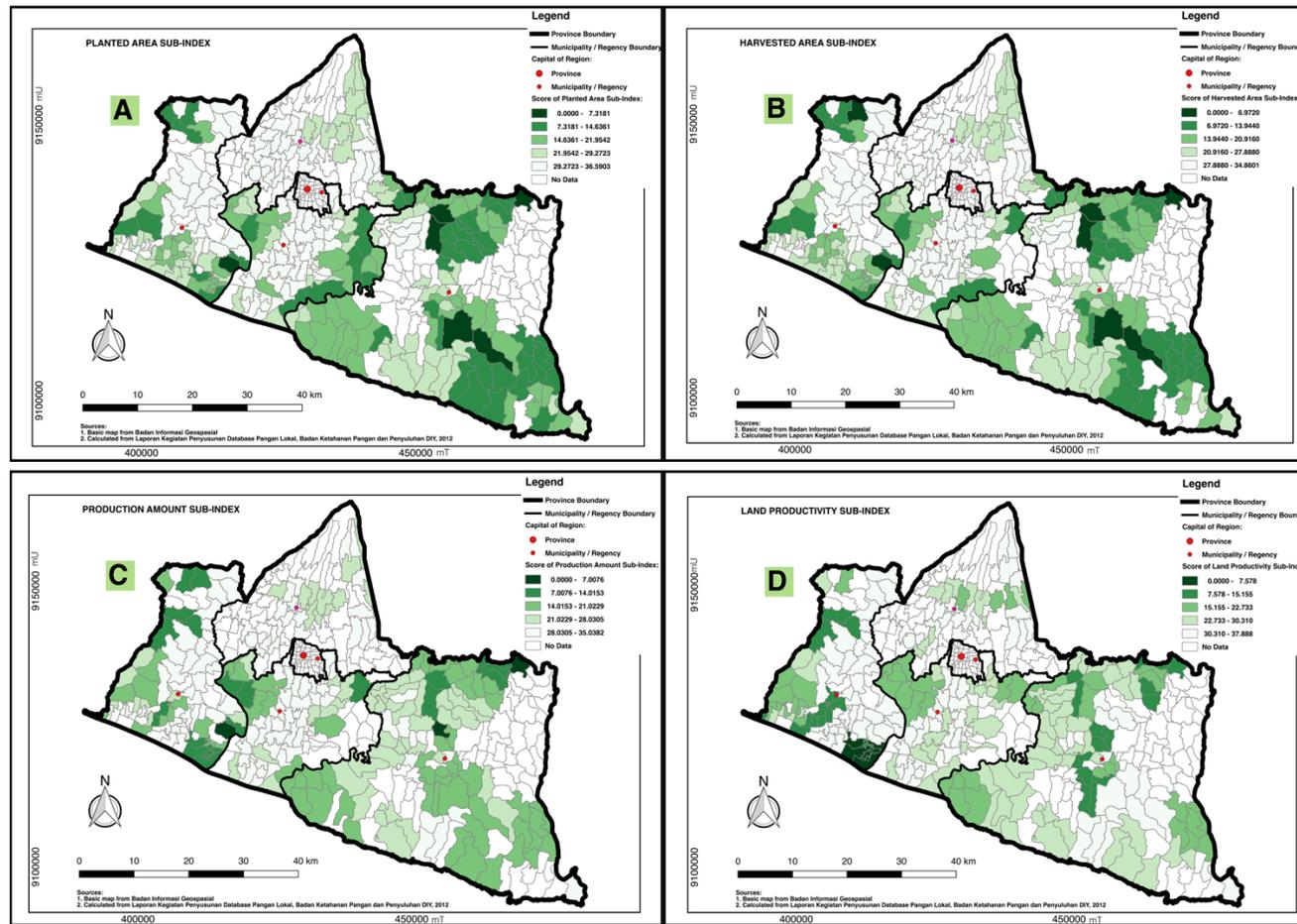


Figure 2. 4. Local food sub-index. 2.4A. Planted area sub-index, 2.4B. Harvested area sub-index, 2.4C. Production amount sub-index, 2.4D. Land productivity sub-index.

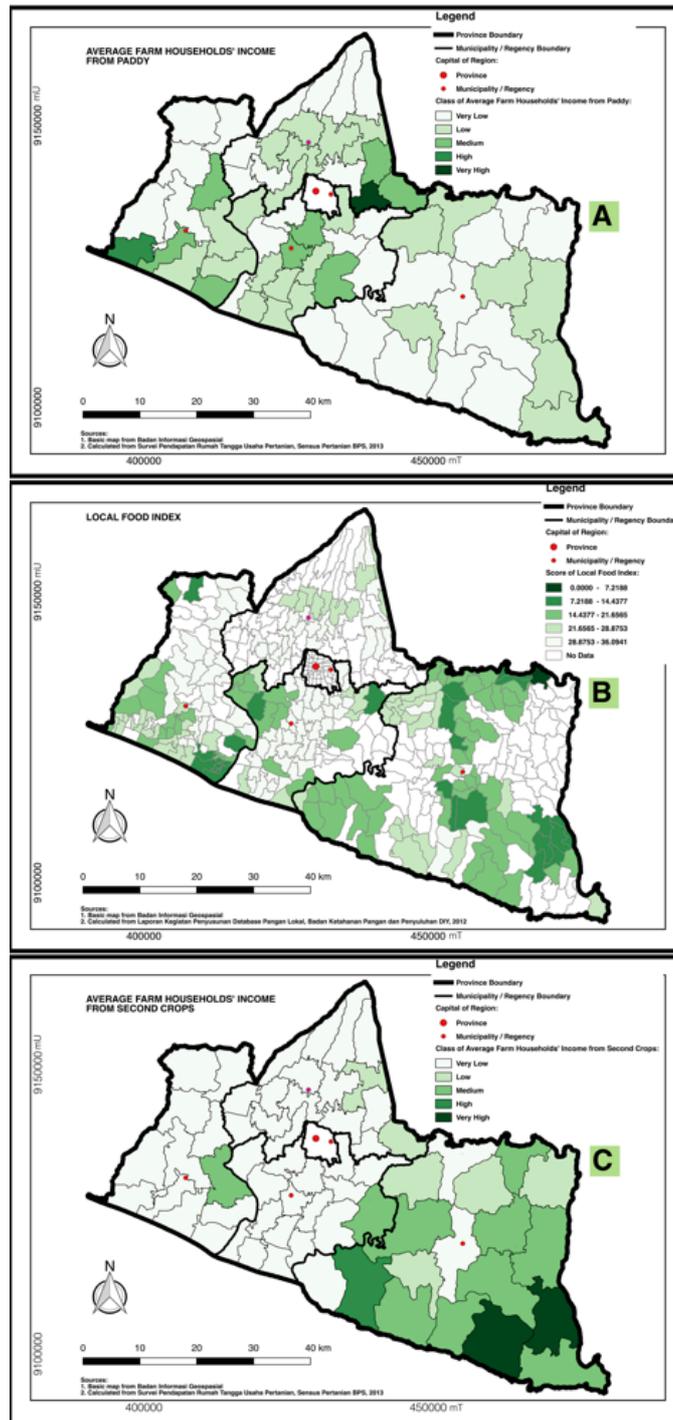


Figure 2. 5. (2.5.A) Average farm households' income from paddy, (2.5.B) Local food index, and (2.5.C) Average farm households' income from second crops.

### 2.3.2. Discussion

Before entering the discussion section, firstly this chapter returns to the first research question: Where are the local food potentials seen in DIY? To sum up the results, the composite index (LFI) shows that Gunungkidul and Kulon Progo are two regencies in DIY that have relatively higher local food potentials. Most the highly potent villages are concentrated in the rural areas, relatively distant from the urban area of Yogyakarta (the city of Yogyakarta and its surrounding area). This pattern is in line with the previous literature mainly from the western countries showing that the local food activities are concentrated in the rural areas (Ilbery et al., 2006). However, in DIY context, the reasons why this spatial pattern emerge seems different, considering the regional geographical characteristics.

According to Rijanta and Rotgé (2000), Sleman and Bantul regencies include the most suitable place to grow rice, also mentioning farmers' practices agroforestry in Gunungkidul. Meanwhile, in Kulon Progo that has both lowland and upland areas, three crops of rice, fruits, and vegetables are main commodities.

Gunungkidul, where the local food potentials are found in this study, was previously a critically underdeveloped region (Proyek Penelitian dan Pencatatan Kebudayaan Daerah, 1978) and it was estimated in the 1940s and 1950s possible to plant only tea or coffee (Whitten, Soeriaatmadja, & Afiff, 2000). However, after the government introduced the greening program in the mid-1970s to the mid-1980s (Maryudi et al., 2015; Soerianegara & Mansuri, 1994) the landscape in Gunungkidul had drastically changed. This program succeeded in greening the formerly critical areas, and the local inhabitants could have other choices for their livelihoods: for example, to plant trees or utilise food crops (Maryudi et al., 2015; Soerianegara & Mansuri, 1994).

There is another question: why the local food potential is concentrated in these particular areas? Based on not only index-based descriptions but also on an extended explanation, it is possible to consider some factors contributing to shaping the patterns of the local food potentials, such as: 1) physical support, represented by the ZAE, and 2) economic motive represented by the income level.

This chapter found that more than half of the selected top 50 villages in the LFI are located not in the suitable area for the local food production. Several reasons can probably be called into account. Firstly, it is possible for farmers to tend to expect main staple foods such as rice suitable for the local geographies rather than local food crops to gain their income (Mardianto & Djauhari, 2015). But, secondly, local food is sometimes planted as an

intermittent crop in the paddy fields, using the rotation scheme: rice-rice-second crops, or the mixed cultivation of taro (talas) in private forests, and cassava using intercropping technique to take care of ecological conditions for farming, to disperse possible risks and to double gains (Pearson, Falcon, & Jones, 1984; Roche, 1984; Sudomo & Hani, 2014; Sumaryanto, 2004).

As for a more economic factor, Sumaryanto (2004) attempts to compare the average income received by paddy farmers in the same agroecosystem area in Brantas catchment area (DAS Brantas) in East Java, Indonesia and previous researches of PATANAS. According to Yusdja (1984) PATANAS is Panel Petani Nasional or National Farmers' Panel. Sumaryanto found that the household agricultural income in DAS Brantas was higher compare to PATANAS because of different households sample unit and different farming productivity. Inspired by Sumaryanto's research, based on Figure 2.5B and 2.5C, a similarity pattern analysis can identify that the scores of the LFI are spatially almost in line with the income levels. Comparing the average income from paddy (Figure 2.5A) and the ZAE map (Figure 2.3), there is a spatially similar pattern that the very high and high average incomes from paddy are mostly seen in the subzone IVaq: wet paddy suggested area. In other words, this area is the most favoured place to grow paddy according to Rijanta and Rotgé (2000).

In contrast, the average income from secondary crops (Figure 2.5C) spatially corresponding to the suitable ZAE subzones is supported by the practice of agroforestry in Gunungkidul and Kulon Progo (Hani et al., 2016; Nibbering, 1999; R. Rijanta & Rotgé, 2000; Ritohardoyo & Prakosa, 2002). Through agroforestry, for example, the people in Gunungkidul have options to fulfil their livelihoods by selling forestry and/or farming products in the forests (Nibbering, 1999). Titisari and Setyawan (2018) provide an evidence in TRUBUS magazine, reporting the two farmers in Gunungkidul who plant local food (iles iles) in their cacao home gardens using a polyculture technique. Another practice is also found, for example in general cassava is planted using intercropping technique alongside with perennial crops (Roche, 1984).

The agroforestry practices in Kulon Progo are reported also by Hani et al. (2016). According to their fieldworks, cassava is planted under the *sengon*, clove and cacao tree, their results being essential to local inhabitants livelihood, and local inhabitants attain daily income as a *tempeh* producer, and monthly and annual income derived from the perennial yields: cacao and clove (Hani et al., 2016). This information probably can explain why the non-food crops subzone (Type 1) relatively show very high and high income comparing to other ZAE types (Types 2, 3, and 4).

Before closing this discussion, it is necessary to return the “hidden potential” issue proposed in this chapter. This study identifies the particular places as a concentration of local food potentials. People can receive benefit for the nutrition and health by consuming local food (Mardiharini, 2016). Farmers can receive a double benefit for their economic lifestyle from their trade activities in addition to self-subsistence (Falcon, Jones, & Pearson, 1984; Nelson, 1984). Indeed, local food crops are produced widely in rural DIY, and they potentially give an opportunity as a food stock, expecting to tackle food crisis or food insecurity in some, particularly in poor villages in DIY (Widiyanto, 2018). If local food crops are processed into other forms of commodities, they lead to a value-added product, such as flour (Munarso, 2016).

Moreover, as for flour for example, Munarso (2016) explains the multiplier effect through three scales of industry: 1) home industry, 2) agro-industry, and 3) mix-flour industry (mixture of local and wheat flour). One example is about a modified cassava flour (*mocaf*). Since developed in 2015, now *mocaf* is widely distributed not only in Java but also in Papua, South Kalimantan, and Gorontalo (Vebriansyah, Setyawan, Ramadhan, & Pratiwi, 2018). Local households, communities or community-based organizations, and larger-scale industries probably receive an advantage from such processed local food (Vebriansyah et al., 2018). Meanwhile, although currently the spatially concentrating production of local food crops is potentially hidden, and how to ship and market local food commodities is not clearly discussed in this chapter, it possibly brings about severe competitions among such producing places, leading to increased production in a particular place and declined production in the other place.

## **2.4. CONCLUSIONS**

This study finds out that there are two local food potential regencies in DIY: Gunungkidul and Kulon Progo. Considering the agro-ecological factor in order to discuss why such concentrations emerge in those regencies, this chapter identifies two reasons why most the actively producing villages are not located in the ‘hypothetical zone’. Firstly, local food crops are able to be grown in various agroecological environments, and secondly the farmers often practice intercropping cultivation on paddy and agro-forestry fields. The average income approach also shows the correspondence of spatial patterns between the income levels and the LFI scores.

It is expected that, after the local food potential in DIY are mapped out, the hidden local food potentials are found. This kind of information is useful as a supporting tool to anticipate

tackling food crisis that is predicted in 2037 by the BKPP DIY (Kedaulatan Rakyat, 2017), for example by indicating the particular villages that can be promoted as the potential pockets of local food production. Indirectly, the findings from this study is also useful to provide information about how the “hidden potential” of local food are explored, ranging from nutrition and health to various livelihood impacts that are received by the stakeholders' local food practices.

Finally, this chapter has provided a methodological foundation on local food study from the geographical perspective, attempting to map out the hidden local food potentials. However, this chapter identifies some limitations. Firstly, the index explained in this chapter seem only to give general information. A detail explanation is still needed, particularly on analysing the local food crops. In particular, this chapter focuses just ten local food crops. However, a variety of other local food crops are necessary to be incorporated into the local food index (LFI), almost neglected in the analysis.

Further researches are needed to address these issues. For instance, an alternative method such as Location Quotient (LQ) devised in a previous research (Watts et al., 2011) probably can give a contribution to the analysis of local food potentials from a different quantitative perspective. Secondly, this chapter only provides an analysis of physical and economic factors. Other possible factors are needed to explore deeply and enrich the geographical studies and also other disciplines interested in local food. Thirdly, this study only pays attention to the first and second aspects of the "triple burden" theory of local food that is proposed by Professor Moerdijati Gardjito. There remains one issue unanswered in this chapter: the policy matter. Therefore, there are potentially future researches exploring to what extent of the local food policy are delivered in DIY.

# CHAPTER 3

# CHAPTER 3. AN EXPLORATION OF FOOD INSECURITY, POVERTY, LIVELIHOOD, AND LOCAL FOOD POTENTIALS IN KULON PROGO REGENCY

## 3.1. INTRODUCTION

Poverty and food insecurity are two interacting aspects that potentially disrupt the livelihood of people, especially in developing countries. A Nobel Prize-winning economist, Amartya Sen explains that the poverty can be defined in the two terms: ‘consumption’ and ‘poverty line’ (Sen, 1982). Moreover, according to Sen (1982, p. 11), the poverty should be defined as “identification” and “aggregation” for explanation. The identification concept pays attention to the group of poor people, while the aggregation concept refers simply to a composite of what poverty is. Poverty is a never-ending complex issue, and so many scholars have been interested in discussing it. One notable aspect explains poverty as the concept of deprivation (Noble, Wright, Smith, & Dibben, 2006; Sen, 1982). According to Noble *et al.* (2006, p. 172), the poverty is related to the conditions that people cannot fulfil financial demands, while the deprivation is caused by other factors such as “lack of resources”. A previous research by Pereira *et al.* (2014, p. 340) argues that well-managed “household’s assets” are needed to enhance the food security. Similarly, concerning assets rooted in the livelihood literature, Ellis (2000, p. 10) define “a livelihood comprises the assets (natural, physical, human, financial and social capital), the activities, and the access to these (mediated by institutions and social relations) that together determine the living gained by the individual or household”.

Indonesia is one of developing countries which is some of its areas are prone to poverty and food insecurity, especially in Yogyakarta Special Province. According to various digital and paper-based mass-media reports, until 2016 twenty villages in Yogyakarta Special Province have been recorded as the category of severe on food insecurity (Bisnis.com, 2016; Sindo, 2016; Solopos.com, 2016). Kulon Progo, as part of Yogyakarta Special Province, faces the most severe condition of food insecurity compared to other regencies within this area in 2015. The Yogyakarta Special Province for Food Security Agency and Extension (*Badan Ketahanan Pangan dan Penyuluhan/BKPP DIY*) officially published the classification of food insecurity villages. For measuring food insecurity, the BKPP DIY uses three indicators for each village: local food production, purchasing power parity, and access to food (Bisnis.com, 2016).

Furthermore, a food insecurity village, characterised by these three aspects including declining in purchasing power, lack access to gain food, and low production of local food (Bisnis.com, 2016).

Food insecurity is easily defined as the opposite concept of food security. Food insecurity cannot be separated from the matters of poverty, livelihood, and resources (Borch & Kjærnes, 2016; Carlson, Andrews, & Bickel, 1999; Eroğlu, 2013; Frongillo, 1999; Hadley & Crooks, 2012; Mooney & Hunt, 2009; Rose, 1999; Tomlinson, 2013). It potentially leads to hunger and malnutrition if not well-managed (Borch & Kjærnes, 2016; Carlson et al., 1999; Frongillo, 1999; Rose, 1999). To tackle the hunger problem due to food insecurity, Mooney & Hunt (2009, p. 477) suggest improving the quantity side and point out the importance of “access” particularly on how poor people could attain food. Mooney & Hunt’s statement is supported by Pereira *et al.* (2014) who explain that for poor people the income limitation is an obstacle for accessing food.

Food insecurity emerges as a national issue in the Indonesian context. The Central Government has increasingly paid more attention to this issue and then stipulated the Law of Food (Law No. 18) in 2012. It was in 2005 when the Central Government published its first initiative policy document which paid attention to food insecurity issue. The Central Government, which was represented by *Dewan Ketahanan Pangan* worked altogether with World Food Programme to produce its first policy document, Food Insecurity Map (DKP, Pertanian, & WFP, 2009). This program continued from 2009 to 2015 when the Central Government published Food Security and Vulnerability Atlas or FSVA (DKP et al., 2009; DKP, Pertanian, & WFP, 2015). The maps help the decision makers and users to identify the food insecurity regions by the composite index (DKP et al., 2009).

Due to its problem of the statistical unit, the FSVA document only present the information at the national, provincial, and Regency/municipality levels. There is no information in this document if stakeholders or users are willing to seek for analysis at the village level. Indeed, for example, there are two studies, which explain food insecurity conditions in the rural area (Hapsari & Rudiarto, 2017; Subejo et al., 2017). These studies explain accurately on how the importance to adopt the FSVA method as a mean for the decision makers to alleviate food insecurity. It also gives some reliable answer for village-level under-researched gaps by other data as a complementary, which has not been demonstrated by previous FSVA studies. The provincial or regency government also gives such information.

For example, in Yogyakarta Special Province, the BKPP DIY regularly publishes an annual report that contains information of food insecurity villages.

In addition, several previous studies on livelihood have been conducted in the Yogyakarta Special Province context (Baiquni, 2008; Gunardo, 1999; R. Rijanta, 2008; Sutanto, 2008; Widyatmoko, 2008), enriched with some studies from the other developing countries (Kristjanson, Radeny, Baltenweck, Ogutu, & Notenbaert, 2005; Magombeyi, Taigbenu, & Barron, 2016). The studies in Yogyakarta Special Province explain how rural households have coped with Indonesia's financial crisis in 1998. On the other hand, different perspectives of livelihood are offered in the spatial context rather than in the household or individual context. Some previous articles discuss livelihood in the regional settings. For example, a study of Kenya's experience offers how to map livelihood at a sub-district level (Kristjanson et al., 2005). Another survey in Africa presents an effort on how to conduct a spatial analysis by mapping four components: food insecurity, poverty, livelihood and water resources (Magombeyi et al., 2016). However, the study of poverty, food insecurity, livelihood and local food potentials in spatial perspective is limited.

This chapter presents the discussion for food insecurity village from a different dimension to address the limitations by analysing these published village data at the regional level and adopting the concepts of local food centres and local food crops introduced in the previous study (Subejo et al., 2017). Therefore, the primary aim of this chapter is to present a description of the geographies of rural deprivation in Kulon Progo Regency. Spatial analyses were used to map the poverty, food insecurity, livelihood and local food potentials in this area.

## **3.2. RESEARCH METHOD**

### **3.2.1. Research design**

The research is taken place in Kulon Progo Regency (Figure 3.1) that locates in the west part of Yogyakarta Special Province, Indonesia, and which is divided into 12 sub-districts (*Kecamatan*) and subdivided into 88 villages (*Desa*). According to the BPS Kulon Progo (BPS, 2008), Kulon Progo Regency is divided into three parts from north to south. The north part consists of the sub-districts of Girimulyo, Nanggulan, Kalibawang, and Samigaluh. Sub-districts as Sentolo, Pengasih, and Kokap locate in the middle section. Temon, Wates, Panjatan, Galur, and Lendah are in the south part. These geographical parts have their specific characteristics: upland areas in the north region, transitional and hilly areas in the middle section, and lowland areas in the south part, respectively (BPS, 2008). This chapter uses three

geographical terminologies: upland, transitional, and lowland regions to explain the geographic profiles.

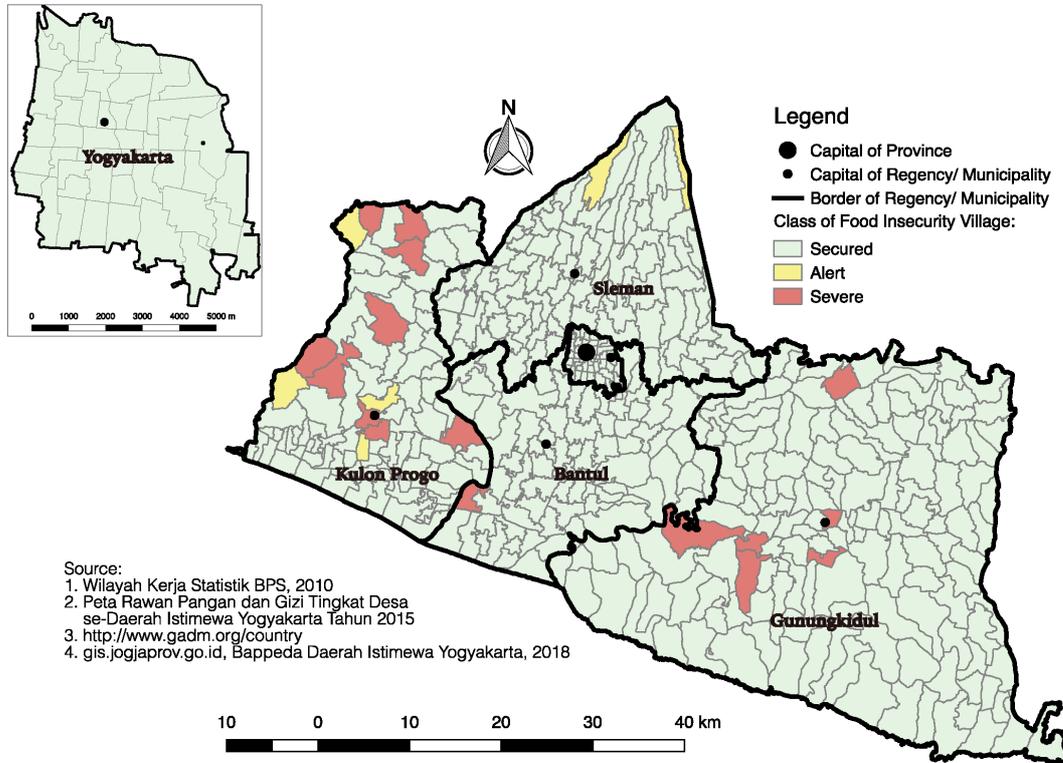


Figure 3. 1. Food insecurity villages of Yogyakarta Special Province, 2015.

This chapter employs an exploratory research design presented in Figure 3.2 This flowchart shows the process that is conducted in this chapter starting from defining research questions, then reviewing previous works of literature, next presenting the research questions. It is followed by offering its research methods and results. The next step is a discussion, and finally, this chapter is closed with conclusions.

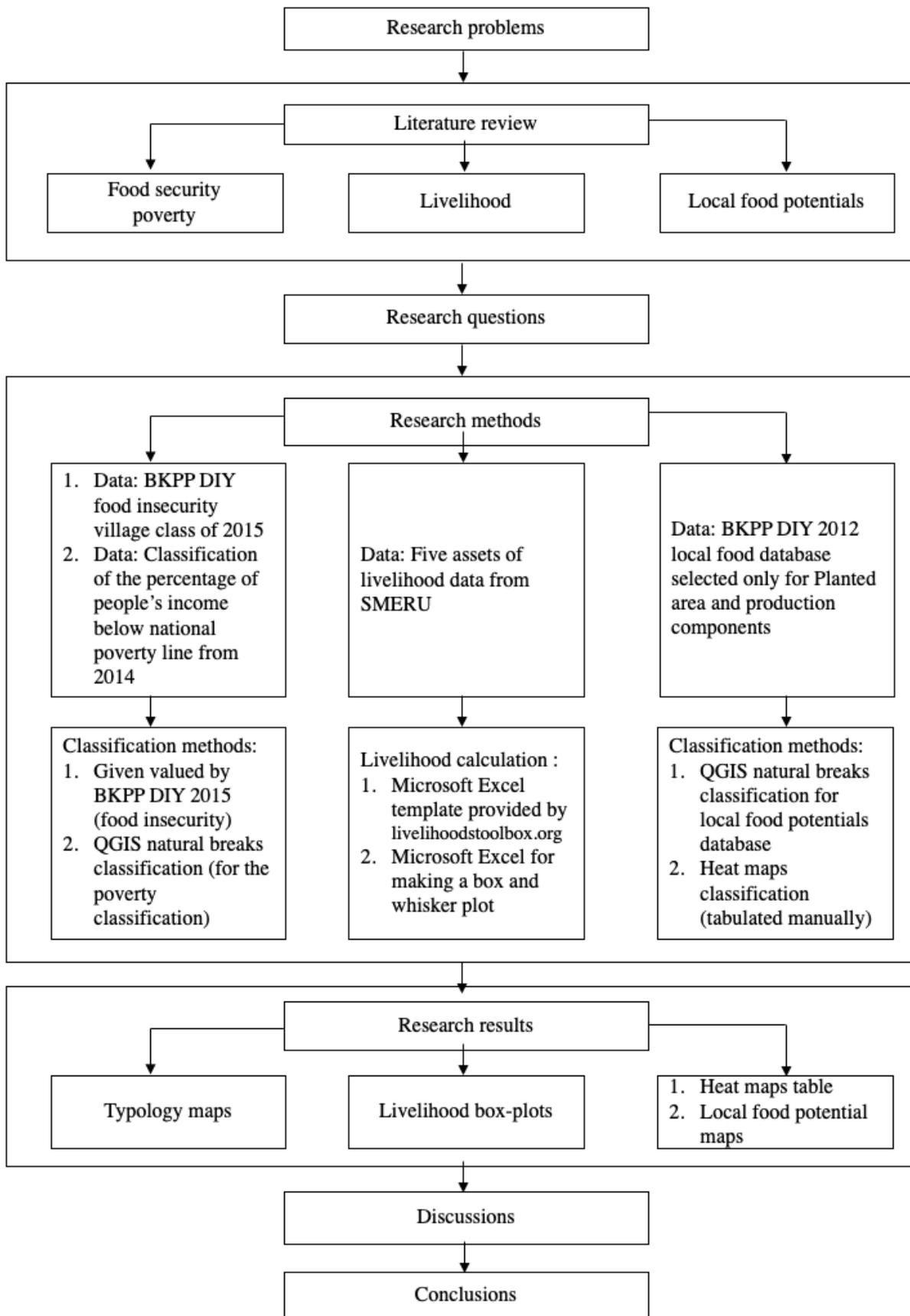


Figure 3. 2. Research design flow chart.

### 3.2.2. Data used and data processing

This research utilises secondary data which are published by the government and non-government institutions (BKPP DIY and SMERU, respectively). In detail, the data concerning the food insecurity and the local food potential are derived from the BKPP DIY (Badan Ketahanan Pangan dan Penyuluhan Daerah Istimewa Yogyakarta [BKPP DIY], 2012; BKPP, 2015), while the operational definition of poverty and livelihood comes from SMERU (SMERU, 2014). In particular, this research analyses 1) food insecurity following the data provided by BKPP based on three categories of secured, alert, and severe. Then these categories are analysed altogether with poverty in order to form deprived rural area analysis.; 2) the number of poor people based on the national poverty line; 3) livelihoods with five asset components; and 4) local food potentials (Table 3.1, the detail scoring and weighting is provided in Appendix 2.1).

Table 3. 1. Poverty, food insecurity, local food and livelihood data.

No	Component	Indicators	Data Source
1	Poverty	The number of people below the national poverty line	SMERU, 2014
2	Food Insecurity	Food insecurity villages category (Class)	BKPP, 2015
3	Livelihood	1. Natural capital 2. Physical capital 3. Human capital 4. Financial capital 5. Social capital Notes: Detail of these indicators present in appendix 1	SMERU, 2014
4	Local Food	Planted area and production of ten of local food crops	BKPP, 2012

Firstly, the data on poverty and local food production are processed by Microsoft Excel and QGIS 2.18 software. A classification gives a meaning for the values or constructed index (Noble et al., 2006). Natural Break (Jenkins) method that leads to specific/classification of the village poverty levels and local food potentials is chosen for this research. According to Brewer and Pickle (2002, p. 663), Natural Breaks is selected due to its ability “to minimise variation within classes”. Helped by QGIS software, the calculation leads to a three-category classification: high, medium, and low rating. Indonesia’s Law of Food (Law No. 18) is used to identify the production of the local food. Based on this, local food is defined as food that is consumed by local people based on the local production potentials and the local wisdom or

indigenous knowledge. For the local food production and potential, this chapter focusses 10 kinds of tuber: cassava (*ubi kayu*), sweet potato (*ubi jalar*), edible canna (*ganyong*), arrowroot (*garut*), prasina (*gadung*), birch rim yam (*gembili*), pumpkin (*labu*), tuber (*uwi*), breadfruit (*sukun*), and lastly elephant's foot (*suweg*).

The classification of food insecurity villages has been conducted by the BKPP DIY (BKPP, 2015). This classification is resulted from developing the food insecurity index, graded by the points on food availability, access and utilisation. To measure the food availability, the BKPP uses three-year average production outputs of rice, maize, cassava, and sweet potato. The reason for the BKPP DIY to choose these crops is based on the argument that the primary source of human energy comes from cereals and tubers (BKPP, 2015). The BKPP DIY (BKPP, 2015, p. 9) states that “more than 50% of food consumption in Indonesia is from grains on the calorie basis”(translated by the author from Bahasa). Further, to construct the access parameter, the BKPP DIY employs Pre-Welfare Households (*Keluarga Pra-Sejahtera*) and Welfare Households level 1 (*Sejahtera I*) which are supported by the time-series data of Monthly-price, Farmers' Terms of Trade Indices (*Nilai Tukar Petani*), and Human Development Index (*Indeks Pembangunan Manusia*). Lastly, the food utilisation is explained by the level of children-under-five underweight (*prevalensi gizi kurang pada balita*). The three measures are combined to construct the composite index by the BKPP DIY. Therefore, it is supported by previous researchers on deprivation suggestion, that the best way to measure deprivation is to use by using a composite index (Messer et al., 2006; Noble et al., 2006).

In particular, following the suggestion from previous researchers then this chapter offers a combination approach for constructing the deprivation typology (Glaeser, 2016; Messer et al., 2006; Noble et al., 2006). Combination of poverty and food security construction is also suggested by other scholars (Magombeyi et al., 2016), with their ‘tandem’ terminology. The poverty component is derived from the number of poor people below the national poverty line, containing three classes: high, medium, and low. In another word, the food insecurity component includes three classes of the food insecurity village: severe, alert, and secure, derived from the BKPP DIY report (BKPP, 2015). The BKPP DIY's typology of food insecurity villages was adopted to categorise the poverty: ‘severe’ to ‘high’, ‘alert’ to ‘medium’, and ‘secure’ to ‘low’ categories. Finally, LISA approach was used to construct a ‘new typology’(Anselin, 1995). Anselin's idea presents a categorical approach by providing a quadrant analysis of low-low, low-high, high-low, and high-high categorisation. However, this chapter needs to present nine cells that are consisted of three classes for each component.

Therefore, the 'new' typology was modified into low-low, low-medium, medium-low, medium-medium, high-low, high-medium, low-medium, medium-high, and high-high. Scenario planning discipline employs this nine cells classification or 3x3 matrix (Ringland, 1998).

The process of livelihood counting and graphing is supported by the MS-Excel macro-toolkit Livelihoods Toolbox (beta), which is provided by the International Federation of Red Cross and Red Crescent, available at <http://www.livelihoodstoolbox.org>. Following the guideline of this tool, it is essential to use the values for inputting that is weighted on raw scores based on the community or household perspectives. However, in this chapter, the weight for each indicator is given by the researcher (see notes in Appendix 2.1 for the explanation), considering the importance of every index for the regional settings. Finally, the box and whisker plot were drawn by using Microsoft Excel based on Rowell's tutorial (Rowell, 2012)

### **3.3. RESULTS AND DISCUSSION**

#### **3.3.1. Village typology of severe conditions**

The typology of all the villages in Kulon Progo is constructed from the two dimensions of poverty and food insecurity, each of which includes three categories of 'low', 'medium', and 'high'. The calculation leads to 9 classifications (Figure 3.3 and Table 3.2). There are nine typologies and then be categorised into two distinct groups: un-severe and severe groups. Furthermore, this distinction has four categories: 1) un-severe; 2) severe on poverty; 3) severe on food, and 4) critical on both (poverty and food). In general, most of the villages in Kulon Progo are un-severe villages (68 villages). The rest of communities, 20 of 88 villages, are severe villages (Table 3.3). Eleven villages have a problem of poverty. Meanwhile, seven villages have to struggle with food insecurity. Finally, two communities are facing both issues: poverty and food insecurity.

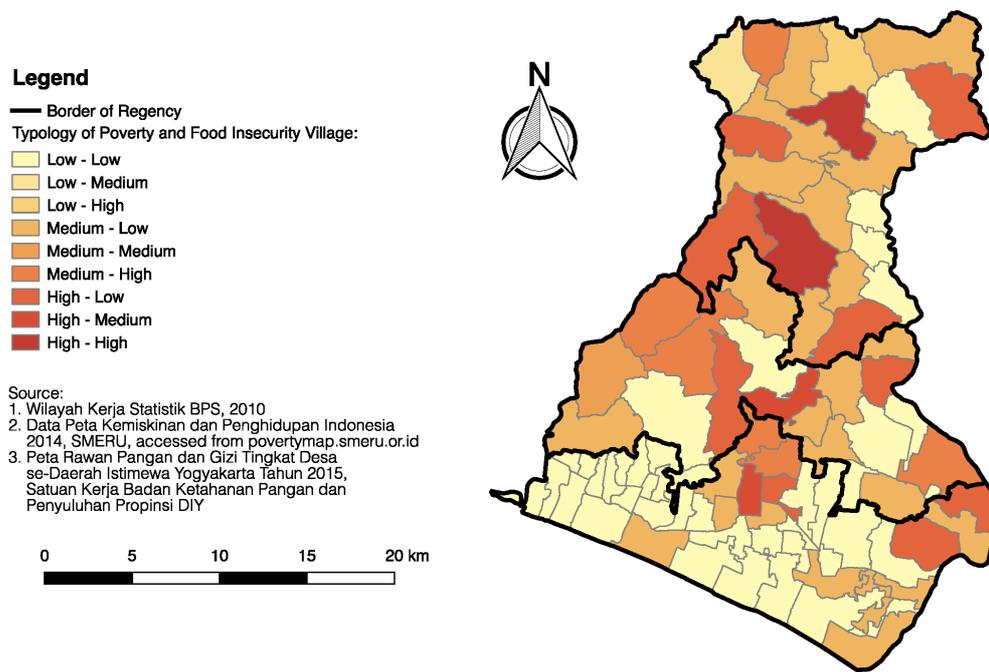


Figure 3. 3. Typological map of poverty and food insecurity villages in Kulon Progo

Table 3. 2. The number of village typologies in Kulon Progo.

No	Typology (Poverty and food insecurity villages)	Number of villages	Category
1	Low-Low	41	Un-severe
2	Low-Medium	1	Un-severe
3	Medium-Low	25	Un-severe
4	Medium-Medium	1	Un-severe
5	High-Low	9	Severe on poverty
6	High-Medium	2	Severe on poverty
7	Low-High	1	Severe on food
8	Medium-High	6	Severe on food
9	High-High	2	Critical on both (Poverty and food)

Table 3. 3. Villages in severe condition in Kulon Progo.

No.	Village name	Geographical zones (*)	Typology (poverty and food insecurity)	Category
1	Gotakan	Lowland	High – Low	Severe on poverty
2	Sidorejo	Lowland	High – Low	Severe on poverty
3	Ngentakrejo	Lowland	High – Low	Severe on poverty
4	Sentolo	Transitional	High – Low	Severe on poverty
5	Karangsari	Transitional	High - Low	Severe on poverty
6	Jatimulyo	Upland	High – Low	Severe on poverty
7	Donomulyo	Upland	High – Low	Severe on poverty
8	Banjarharjo	Upland	High – Low	Severe on poverty
9	Kebonharjo	Upland	High – Low	Severe on poverty
10	Bendungan	Lowland	High – Medium	Severe on poverty
11	Pengasih	Transitional	High – Medium	Severe on poverty
12	Sidoarjo	Upland	Low - High	Severe on food
13	Giripeni	Lowland	Medium-High	Severe on food
14	Wates	Lowland	Medium-High	Severe on food
15	Tuksono	Transitional	Medium-High	Severe on food
16	Hargowilis	Upland	Medium-High	Severe on food
17	Hargotirto	Upland	Medium-High	Severe on food
18	Ngargosari	Upland	Medium-High	Severe on food
19	Giripurwo	Upland	High – High	Critical on both poverty and food
20	Purwoharjo	Upland	High - High	Critical on both poverty and food

(\*) Geographical zones are categorised by Kulon Progo BPS (2008).

The severe categories of the typology are then related to the geographical zones (Table 3.3). Firstly, the evidence shows that the poverty-severe villages are located in all geographical zones: upland, transitional, and lowland area. Secondly, the severe food insecurity communities are found mostly in the upland area. Thirdly, two villages that are embedded in both severe conditions: poverty and food, are located in the upland area. In short, based on this explanation,

most of the severe villages (poverty, food, and both categories) are generally located in the upland area.

### **3.3.2. Capital assets of livelihoods**

This part presents the five capital assets of livelihood based on their geographical variations related to the proposed typology (Figure 3.4). The figure shows that the social asset shows the highest value compared to others, followed by the human asset. Next, the natural asset is on the third rank, followed by the physical assets and lastly, the financial asset stand for the last position. Meanwhile, geographically, a comparison is given to the lowland, the transitional, and the upland regions. There is an unequal distribution of the physical, human, and financial assets. A significant gap of uneven distribution is found in the upland area for the physical asset. Meanwhile, in the transitional region, there are only a few gaps. Lastly, the financial asset tends to be a problem in the transitional and the upland areas because of its unequal distribution.

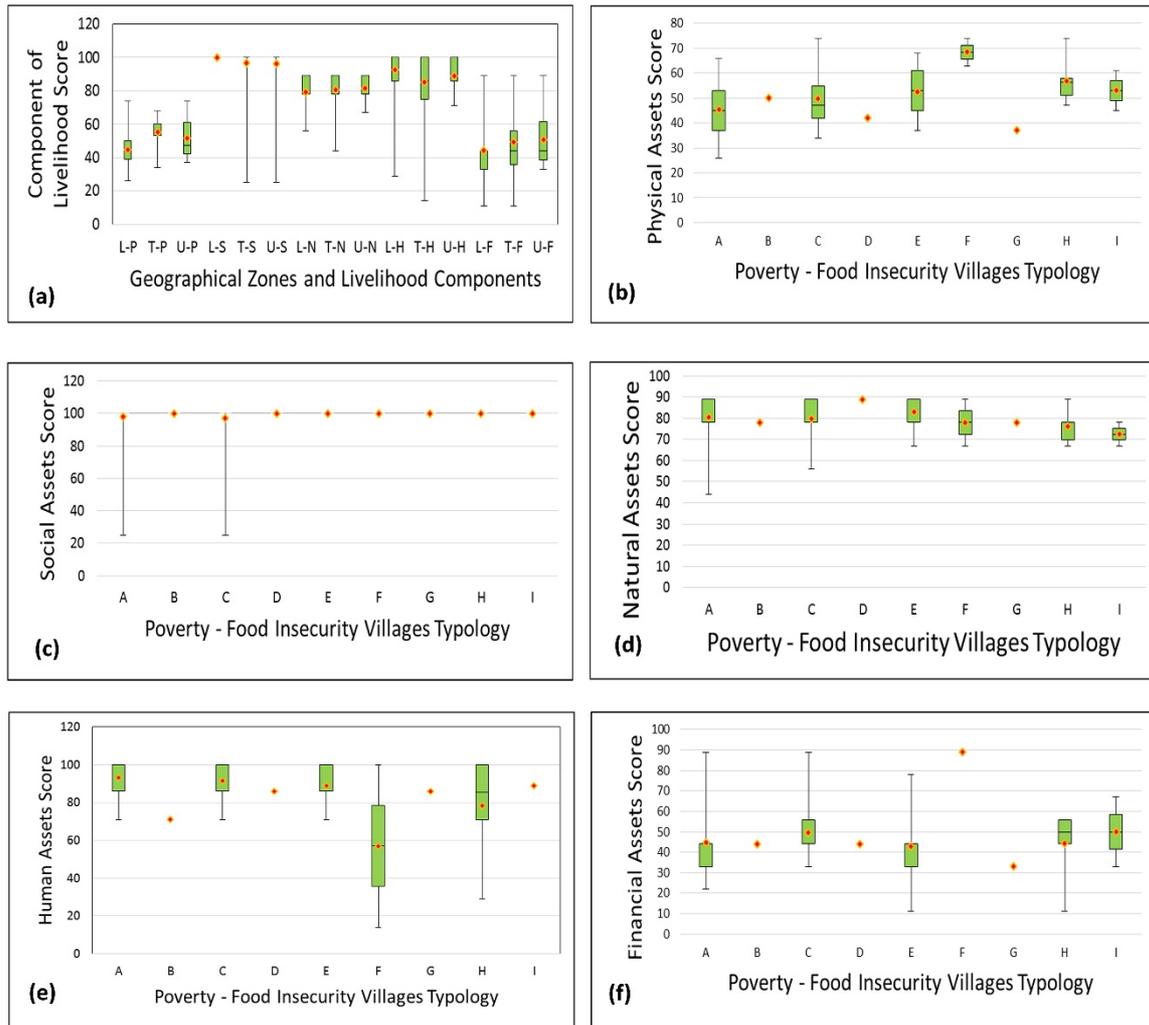


Figure 3.4. Characteristics of capital assets of livelihoods in Kulon Progo. Note for Figure 3.4a: L-P: Lowland-Physical assets; T-P: Transitional-Physical assets; U-P: Upland-Physical assets; L-S: Lowland-Social assets; T-S: Transitional-Social assets; U-S: Upland-Social assets; L-N: Lowland-Natural assets; T-N: Transitional-Natural assets; U-N: Upland-Natural assets; L-H: Lowland-Human assets; T-H: Transitional-Human assets; U-H: Upland-Human assets; L-F: Lowland-Financial assets; T-F: Transitional-Financial assets; U-F: Upland-Financial assets. Note for Figure 3.4b – 3.4f: A:Low-Low, B: Low-Medium, C: Low-High, D: Medium-Low, E: Medium-Medium, F: Medium-High, G: High-Low, H: High-Medium, I: High-High.

The geographic difference of livelihood assets is shown in Figure 3.4a. In this figure, there is an evident difference in the values among five livelihood assets in Kulon Progo (Figure 3.4a). Moreover, the physical livelihood asset in Kulon Progo shows various values according to the typologies (Figure 3.4b). In general, there are no differences among communities that are grouped into un-severe areas: low-low, low-medium, medium-low, and medium-medium, an unequal distribution being found only in the medium-medium typology. For the second group of poverty typology: high-low and high-medium, there seem no uneven distributions.

Meanwhile, for the third group, the food insecurity villages, there is an unequal distribution. For the last group is severe group of both typologies: high-high. For this severe group, there is no difference between the villages. Furthermore, for the social livelihood, there are no differences among the nine typologies (Figure 3.4c). For the un-severe group, nevertheless, it is found that there is a significant gap for the values of two types of regions: low-low and medium-low. While the values of the natural livelihood asset tend to decrease following the severity of poverty and food insecurity (Figure 3.4d). In general, the natural asset seems to affect the critical groups. It is more likely to change the rural food insecurity villages than the poverty group. In Kulon Progo, relatively no problem can be pointed on the condition of the human livelihood asset, except for the poverty and food un-secured village group: high-medium and medium-high (Figure 3.4e). There are some significant values in these types of community. In short, the human capital affects the poverty group. Last, the financial capital asset has a lower average value, an interval range extending around 30-60 in average (Figure 3.4f). In general, the number of financial institutions are relatively limited, leading to unequal distribution of the financial asset and less availability of these financial services.

From Figure 3.4a-f it can be identified that there is an unequal distribution of development in three geographical areas approaching from the rural livelihood condition (Figure 3.4a). Regarding this issue, there are some strategies. For example, first the availability of pharmacy service (as an indicator of physical capital in Figure 3.4b) particularly in upland area is needed. However, if the establishment of new pharmacy service is impossible, it can be merged with a program from the health office of Kulon Progo Regency called “health supplies and management of medicine” program or program pengelolaan obat dan perbekalan kesehatan (Dinas Kesehatan Kabupaten Kulon Progo, 2019). Second, regarding social asset (Figure 3.4c), even though the data show that only very few villages have experienced a number of social conflicts, it is needed to identify what kinds of social conflict happen in some villages and then how the Government of Kulon Progo Regency regulation can solve this issue. Third, regarding the natural capital (Figure 3.4d) there is a risk of landslide in the upland regions and flood in some lowland areas. In order to mitigate the disaster of landslide that is affected by natural and human factors, it is needed to educate people living in the landslide areas (Fitrianingrum & Ruslanjari, 2018). The government of Kulon Progo has identified where a flood is incident (Media Indonesia, 2018). In addition, the local people also anticipate the flood disaster to be mitigated through building on embankment at the riverside (Kompas.com, 2020). Fourth, in human assets concerning on occupation of people in Kulon Progo Regency agriculture mostly

dominates. It is needed to pay attention to the people who are working in the agriculture sector but facing problem in poverty as indicate in the notion F (medium-high typology in Figure 3.4e). Fifth, the financial asset (Figure 3.4f) is constructed from three indicators. In Kulon Progo Regency, these facilities are mostly dominated by the credit facility, then cooperative, and bank. The bank facilities are not available in all villages. Establishing a new bank needs more consideration. Therefore, people are forced to use an available bank in their nearest town.

### **3.3.3. Local food production and potential**

To answer the question of which regions have local food potentials is given in this part. In this chapter, the local food potential is operationally defined as production amount and planted areas of local food crops. The argument that is offered for the reason is (1) the output has relations to how every community produces a variety of local food crops, and (2) the planted area reflects the future availability of local food crops, mainly for the variety of tubers that need more extended time for being collected. It is known that more than six months are necessary to harvest some tubers.

This part tries to identify spatial specialisation and concentration of local food production at the regional level. As seen in Figure 3.5, Kulon Progo potentially has various local food crops (see Appendix 2.2). The distribution of these local food crops is varied based on the geographical division of labour. In general, the high potential of local food-planting villages is seen in every geographic region. However, the areas of the plantation are varied. Some communities have large planted areas compare to others. For example, in the upland area, the high potential of local food crops regarding planted areas mainly concentrate in the west part. In this cluster, potentially crops such as sweet potato, edible canna and elephant's foot have been planted. In the middle or transitional zone, the concentration of highly planted food crops is also seen in the western part. Several varieties of local food crops potentially are found in this cluster, including cassava and elephant's foot. Finally, in the lowland region, the concentration of local food crops is mostly found in two clumps: middle and east parts. In the part cluster, the highly potential local food crops are sweet potato, edible canna, and pumpkin. Meanwhile, in the eastern group, the potentially main product are cassava, arrowroot, prasina, birch rim yam, pumpkin, tuber, breadfruit and elephant's foot. In short, in the future starting from the year of harvesting, these clusters have a prospect for providing local food products in Kulon Progo.

It is merely to be said that production reflects a regional capacity. The classification of local food crops production can be identified in Figure 3.6 (see Appendix 2.3. for detail). The high output of local food can be found in each of the three geographical regions. In the upland area, for instance, the highly producing villages of local food crops are located in the west and the middle parts. In these two clusters such crops as edible canna, prasina, breadfruit and elephant's foot are much produced in the western group, while the middle cluster has produced cassava, sweet potato, edible canna, and prasina. In the transitional region of Kulon Progo, cassava is the leading local food crop that is much produced in the western part. Finally, there are two production clusters of local food in the lowland region of Kulon Progo, namely western and east cluster. In the west group, there is the only pumpkin that is mainly produced. Meanwhile, in the eastern part, various local food crops are much provided, including cassava, arrowroot, birch rim yam, tuber, and breadfruit.

The illustration of the spatial concentration of local food potential (Figure 3.7) is derived from the local food maps (Figures 3.5 and 3.6). I reconstruct the local food maps by dividing each geographical zone into three imaginaries boundaries: west-part, middle-part, and east-part. As seen in Figure 3.7A, four villages with the highest local planted area locate in the upland area. There are three villages in the transitional zone with the high local food potential. For the lowland area, the concentration of local food plantation is found in the middle part and the east part consisting of five and two villages respectively. Figure 3.7B shows the concentration of local food potentials based on the production dimension. The highest local food production is found in three cells of the western parts across all the geographical zones. There are two villages in the upland zone, two villages in the transitional region, and one village in the lowland zone with their highest potential of local food production. In contrast, there is only a village with the highest local food production potential in the middle part of the upland cell. Finally, two communities have the highest local food production potential that fills in the east part of the lowland cell.

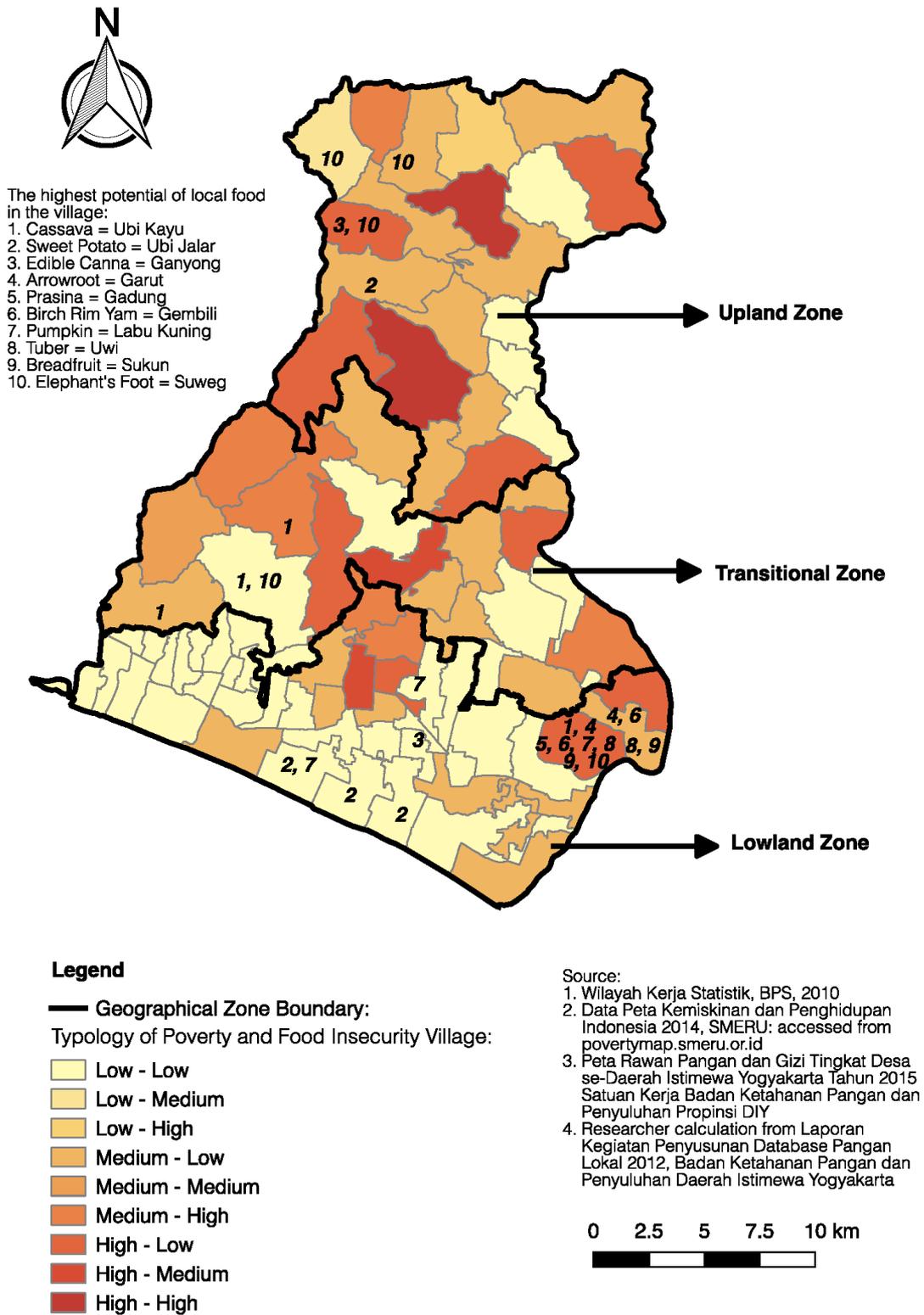


Figure 3. 5. Local food planted area based on its geographical variations and typology.

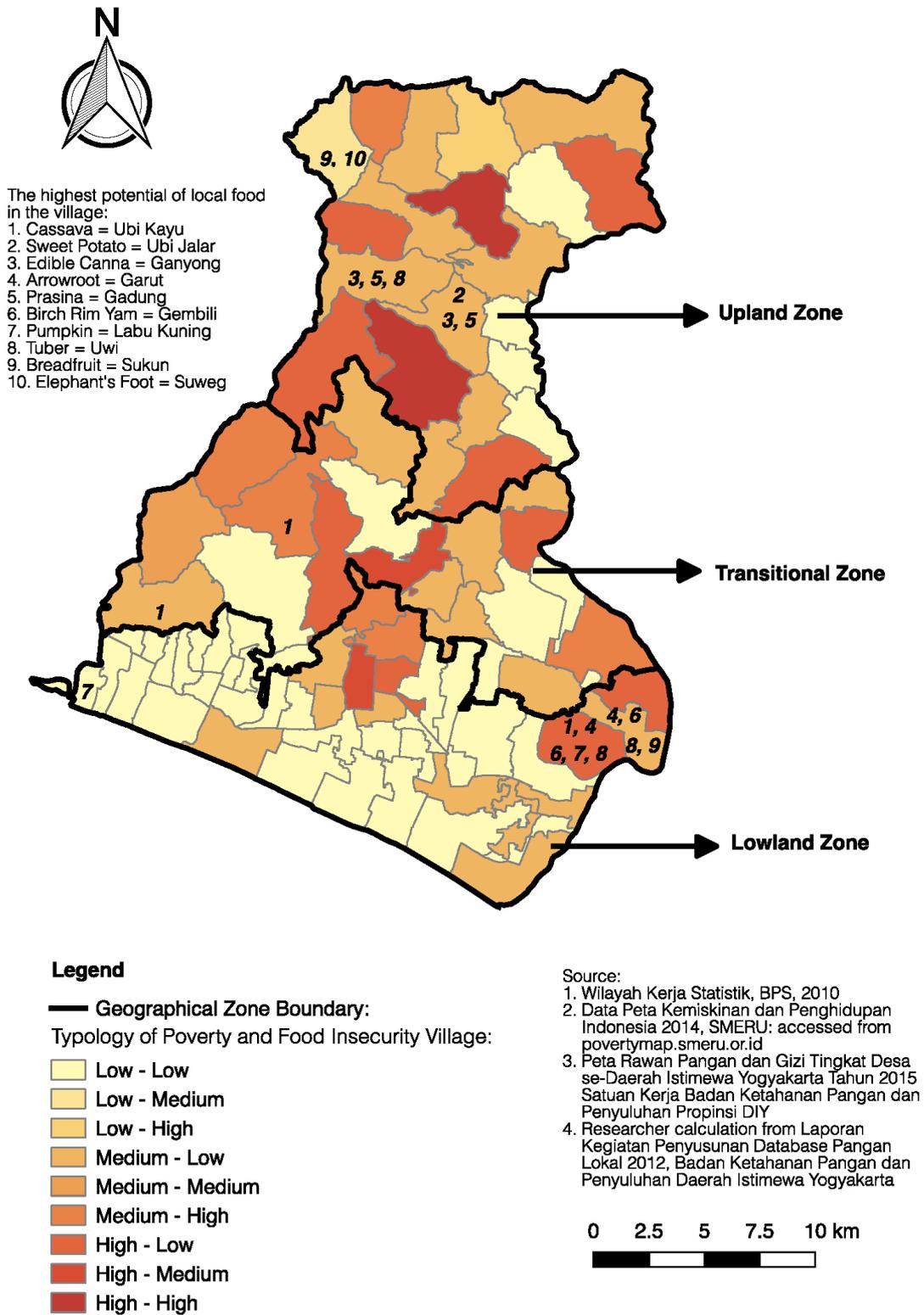


Figure 3. 6. Local food production based on its geographical variations and typology.

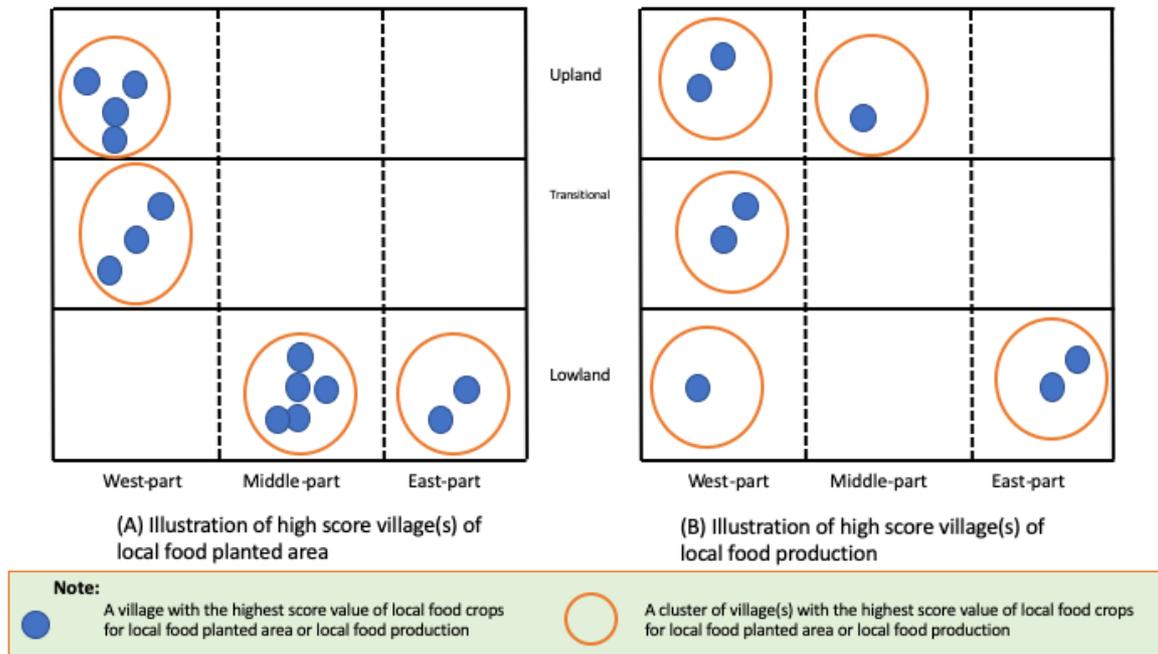


Figure 3. 7. Visualisation of local food potentials clusters in Kulon Progo.

In the maps (Figures 3.5 and 3.6), I draw nine cell (this idea derived from the nine cell scenario planning as I cited in this chapter), then follow the BPS Kulon Progo (2008) typology of the geographical area: upland, transitional, and lowland. I also add three components from my geographical analyses shown in the Figures 3.5 and 3.6. It can be seen from Figures 3.5 and 3.6 where the villages with the highest potential of local food crops are located in the eastern, the middle, or the western part. Then I illustrate my analysis based on these geographical locations of local food potentials (east, west, or middle). I also draw a small circle (blue colour) to represent a village with the highest score value of local food crops for local food planted area or local food production, and a bigger circle (orange colour) to represent the group of village in a cell or a cluster of village(s) with the highest score value of local food crops for local food planted area or local food production. So Figure 3.7 is a representation of my analyses from Figures 3.5 and 3.6.

### 3.4. DISCUSSION

The primary purpose of this chapter is presenting an explanation of the spatial dimension of poverty, food insecurity, livelihood assets, and local food potentials looking at their regional differentiation, concentration, and specialisation. For the first discussion of this chapter, a focus is placed on explaining the first research question: to what extent are rural communities deprived concerning the poverty and food insecurity conditions? Results of this

research demonstrate that geographically, the deprived regions on poverty and food insecurity are located in the upland area.

Typologically, there are two groups of un-severe and severe villages in the conditions of poverty and food security. In general, the finding shows that most of the oppressed communities are located in the upland area (see Table 3.3). This finding is in line with Riggs's conclusion in his previous study in Laos (Rigg, 2006). He states that lack of needed infrastructures and unavailability of resources is the leading causes of poverty. In general, the upland areas, which is commonly far away from the local growth poles, potential face what Sen (1982, p. 1) calls as 'structure of ownership'. Explanation from Qudrat-I Elahi (2006, p. 543), the structure of ownership consists of four dimensions: "trade-based entitlement, production-based entitlement, own-labour entitlement, and inheritance and transfer entitlement". Later, Qudrat-I Elahi (2006, p. 543) discusses the four entitlement into two groups: "ownership possibilities and trade possibilities". Therefore, to improve the severe community condition, these two possibilities should be designed. On the one hand, providing ownership possibilities will reduce the food insecurity. On the other hand, the trade of possibilities will decrease the poverty. Several efforts are needed to reinforce the two possibilities, as developing and maintaining new infrastructures and to strengthen the community livelihood assets are several proposed choices to reduce inequality between the un-severe and severe village typologies.

The second discussion relates to the second research question: whether are there any differences in the livelihood conditions according to the rural deprivation? Citing from Ellis's statement that livelihood is closely related to 'poverty and rural development' (Ellis, 2000, p. 7), to support the rural development, this chapter gives an additional explanation on the spatial patterns of livelihood assets and their relations to the future recommendation for the decision-makers. Additionally, considering the local context of Kulon Progo regency (see Figure 3.4), the physical, natural and financial livelihood assets in Kulon Progo tend to be more severe in the upland area.

A discussion of deprivation and livelihood hopefully will end up on the policy mainly related to the matter of local food. The argument is constructed from the evidence that almost all the villages potentially have local food productions. The previous research also supports this argument that the domestic product has a significant role in improving local people's welfare (Shackleton, Campbell, Lotz-Sisitka, & Shackleton, 2008). Some options could be built from the previous research in Kutai Kartanegara (Subejo et al., 2017). There are at least

two suggestions from their paper, first the importance to set up a regional food system, and the second suggestion is to maximise the local food availability. According to the results of this research, these two options could be adopted in the case of Kulon Progo by designing two choices, firstly planning a local food centre that is stipulated in the Chapter IV article 12 and the 6<sup>th</sup> subsection of Indonesian Law of Food and secondly persuading inhabitants of each village to start regularly consuming local food products in addition to daily rice consumption.

The last discussion concerns the previous research question: how are local food potentials related to the rural deprivation? In sum, a constructed typology is divided into four groups, namely un-severe, poverty severe, food severe, and both (poverty and food) severe. The finding shows that the deprived communities are mostly located in the upland areas. Livelihood conditions in Kulon Progo show that the financial, the physical, and the natural conditions need more concerns by all the stakeholders.

Local food potentials in Kulon Progo also encourage the decision makers to develop the local food centre and/or the local people to consume local food crops for daily consumption. As seen in Figure 3.7, the geographies in Kulon Progo have potential local food clusters to be developed, constructing the connection between these centres and the whole regions. These figures (Figures 3.7A and B) potentially could be used as the entry point to design a policy. By paying attention to the Figures 3.5, 3.6 and 3.7A and B, it can be seen that still there is such kind of “overlapping situation” where the most severe villages have no support by the highest local food potentials. In Figure 3.6, the village with the highest local food production, for example, locates in between of the most severe villages. Therefore the most severe villages need support on how to improve their infrastructure transportation connection and improve the social mechanism so these options will these villages ‘structure of ownership’. So it will lead to the multiplier effect of the most severe villages.

The potential clusters (the nine cells of geographical zones and imaginary boundaries) could have a role to support the present local spirit of Kulon Progo such as *Bela Beli Kulon Progo*. The findings of this chapter should be followed-up by giving the scale of priorities, firstly to both critical poverty and food insecurity villages, then to the severe poverty or food insecurity villages. The identified cluster of local food production is supposed to contribute to reducing poverty and food insecurity conditions in the villages of Kulon Progo. Finally, the identified groups have options to be utilised for daily consumption and/or for sale of value-added products. The possibilities of daily consumption could reduce the food insecurity issue, on the one hand; the value-added products could tackle the poverty issue on the other.

### **3.5. CONCLUSIONS**

To conclude, this chapter shows the unequal geographical distribution of poverty and food insecurity based on the statistical data of the villages. The regional profiles of the rural deprivation in Kulon Progo are presented incorporating the distributions of the oppressive villages and their livelihood conditions. Finally, the local food potentials also are spatially shown in order to identify the concentration and specialisation of local food plantations or productions related to the policy recommendation.

This chapter has several limitations that come from using relatively old data. So, the information in this chapter could not express today's situations. For example, after eight years since the significant data of this chapter were published, there is transformation reflecting the regional performance of Kulon Progo regency and the villages. If there had been an updated publication regarding the local food potential database monitoring the regional production could show a better profile regarding the rural deprivation. Therefore, future issues for example related to the connection of local and regional food system should be explored in advance. This under-researched issues will give detail information on proposed local food centres and their relations in the more comprehensive geographical context. Another remaining question about how to encourage production of local food in non-central places, making ties among poverty, food insecurity, livelihood and local food potentials is exciting to be examined for the next research.

# CHAPTER 4

# CHAPTER 4. WOMEN FARMERS' GROUPS AND LOCAL FOOD PRACTICES IN KULON PROGO

## 4.1. INTRODUCTION

The issue of agriculture in Indonesia can be categorised into three main paradoxes, namely poverty and food insecurity, growth, and export and import (Khudori, 2011b cited in Amir, n.d.). In 2018, the number of farmers in Indonesia were 33,487,806 farmers, around 24 percent or 8,051,328 of them are women farmers (BPS-Statistics Indonesia, 2018, p. 24). Conversely, according to Hillary Clinton, “70% of the world’s farmers are women, but most programmes that offer farmers’ credit and training target men. This is unfair and impractical” (Ezirigwe, 2018, p. 709; Ferguson & Moosa, 2011, p. 2). One statistic is that women produce more than 50% of world food (FAO 2011, cited in Akter et al., 2017), while Doss, Meinzen-Dick, Quisumbing, and Theis (2018) cite the figure of 60-80%. However, women face various issues in farming, including structural, material, and socio-cultural factors (Ager, 2015). Of these, structural factors relate to land ownership (Ager, 2015; Sell, Bäckman, TettehAnang, & Niemi, 2018); material factors relate to women farmers’ access to farming support infrastructures and ability to market their products (Ager, 2015; Tijani & Yano, 2007); and socio-cultural factors reflect women farmers’ roles and responsibilities (Ager, 2015).

In the USA, for example, Horst and Marion (2019) note that male ownership is more dominant than female farmers in terms of the two attributes of non-operating landowners and farm owner-operators, respectively. They analysed data from the US Census Bureau 2013, USDA NASS 2012 and 2014, and the US Department of Labour 2016. Another example from Malawi shows that male farmers have more land than women farmers (Bhaumik, Dimova, & Gang, 2016). These illustrations show that male land ownership exceeds that of women farmers in both developed and developing countries. Regarding market access for women farmers as an indicator of material factors, in developing countries, female farmers commonly face market barriers for their high-value crop (Bhaumik et al., 2016). In terms of socio-cultural factors, women farmers have restrictions on their roles as ‘farmwife’ in Community Supportive Agriculture in Pennsylvania, USA (Trauger, 2004) and as housewives and women farmers in Bogor, Indonesia (Suraningsih, Hubeis, Sadono, Susanto, & Saleh, 2016).

In the context of a developed country, the latest article from Ball has reviewed women farmers (Ball, 2020) from an economic perspective by comparing men and women farmers’ farm ownership. Ball’s article suggests the need for future research on the topic of access,

resources, and productivity of women farmers compared to men farmers in developing countries. Other previous literature showing experience from USA also could be grouped into three sections explaining the practice of women farmers in Community Supported Agriculture or CSA. First, Trauger's article explores CSA practice in Pennsylvania, USA (Trauger, 2004), and explains how women have adapted with their circumstances, with a focus on empowerment and the obstacles faced by women farmers. Second, a report by Trauger, Sachs, Barbercheck, Brasier, and Kiernan (2010) identifies three women farmers' strategies: educational measures, farm management, and local food systems. Third, Jarosz explores what motivations underpin women farmers in Washington, USA, and identifies five strategies practised by women farmers: 1) lifestyle and professional strategy, 2) daily farming strategies, such as food for feed and plants; 3) economic strategy; 4) political and social policies in their food systems; and 5) an educating other people plan (Jarosz, 2011).

Brody and Tuttle's (2015) book provides detailed information on women farmers' activities in the USA as a local food movement through such practices as CSA and farmers' markets to fulfil their economic needs (Brody & Tuttle, 2015). Nooleen Heyzer introduces several case studies to explain what kind of barriers and opportunities exist for women farmers in Asia (Heyzer, 1987). In South East Asia countries, in general, women are evidenced more empowered compare to women in developing countries (Mason and Smith, 2013; IFAD, 2013 cited in Akter et al., 2017, p. 270). Akter et al. identified that women in Indonesia mostly joined in a neighbourhood organisation, such as PKK and religious activities (Akter et al., 2017). In Indonesia, women contribute to agriculture and rural development, particularly from their responsibilities to manage food for their families and also manage their income from their agriculture resources (Akter et al., 2017; Elizabeth, 2008; FAO, 2019). In Indonesia, the role of women farmers is not only as a housewife; they also work on their farms and are members of organisations called *Kelompok Wanita Tani* (Soetrisno, 1997 cited in Nurmayasari, 2014). In this chapter, I follow previous work (for example, Camalin & Setiawan, 2017) in using the operational term *Kelompok Wanita Tani* (KWT) to denote women farmers groups (hereafter, WFGs). WFGs are seen as the channel to empower women (Strempel, 2011).

In Yogyakarta Special Province, particularly in Kulon Progo Regency, the government has suggested consuming local food to reduce rice consumption (Sutarmi, 2018). Moreover, the head of Food and Counseling of Kulon Progo Agriculture Office explained that local food such as tubers has advantages in terms of replacing rice because of its carbohydrate ingredients (Sutarmi, 2018). Local food utilisation has been managed by farmers groups and WFGs

(Sutarmi, 2018). Moreover, according to Maman Sugiri, head of Kulon Progo Food Security and Forestry, Fisheries and Agriculture Counselling, their office has advocated that WFGs prepare food based on local food ingredients (Sutarmi, 2016). This suggestion is supported by an instruction, since 2009, to cook local food as a snack during government meetings (Bupati Kulon Progo, 2009; Sutarmi, 2014). However, for example previous research has recognised two main issues on local food production in Kulon Progo; first issue is policy and structural factors and second issue is technical factors (Raden Rijanta et al., 2013). Moreover, Rijanta et al. identified six structural and nine technical factors. One key structural factor is difficulty “to link policy and practices” (Raden Rijanta et al., 2013, p. 103).

Based on this review, this chapter aims to explore what kind of critical issues arise from WFG activities and experiences of managing local food. Two main questions are proposed: 1) What kind of critical issues emerge from WFG activities, particularly in relation to gender issues, based on members’ experiences and practices in local food?; 2) How are these issues related?

#### **4.1.1. Women and farmers groups**

In her 2004 article, Amy Trauger defined a woman farmer as “a woman who is the primary contributor of labour and decision-making to a farm on a daily basis, or is the employer of individuals who assist with farm work” (Trauger, 2004). In Indonesia, women farmers have established women farmers groups, or KWTs, to support their economic livelihood by maximising agricultural products through agricultural and food production, processing, distribution, and consumption (Camalin & Setiawan, 2017; Ervinawati, Fatmawati, & L, 2002; Fitri & Suhifatullah, 2013; Syarif, 2018; Yuliana, 2017). In the Indonesian context, based on previous literature and conversations with my interviewees, it can be concluded that WFGs are local community organisations that are normally organised on a voluntary basis within a village community, and whose members primarily comprise wives or sometimes daughters of farm households. In some cases, they are organised by government initiative and have include mutual help or collective aid to address local issues. Some women farmers establish WFGs out of economic motives (Ervinawati et al., 2002); to develop their business (Duniai, Mahatma, Wisaniyasa, & Puspawati, 2014); or to provide vegetables by themselves to reduce costs (Nasir, Riadi, Simatupang, & Putra, 2019). Two critical discussions of WFGs in Indonesia cannot be separated from empowerment and the role of government in formed WFGs. A previous study by Yuliati and Iskaskar (2016) demonstrated how KWTs aim to empower their members to

anticipate hunger, while another study demonstrates that the empowerment provided by KWTs benefits their members by providing food for their families (Suraningsih et al., 2016). The role of government is significant when one considers their initiative in forming KWTs. In an example from West Java, a village government initiated a KWT to support women in their agricultural activities (Mutaqqin, Aligita, Muhsinin, Juanda, & Asnawi, 2019).

#### **4.1.2. Women farmers and local food**

Previous research has noted that women farmers' work is characterised by organic practice (Summer, 2004), sustainable agriculture (Finan, 2011; Trauger, 2004), and civic agriculture (Trauger et al., 2010). Women farmers usually manage small-scale farms, particularly in the developing world (McMahon, 2002). For Delind, local food is a 'development tool' to support small-scale farmers (Delind, 2006). In an example from New Hampshire, women farmers are seen as initiators for the local food movement (Brody & Tuttle, 2015). Aucoin and Fry (2015, p. 65) explain the concept of "communities of resistance" with respect to the position of the local food movement in the binary of local and global food studies. However, according to Inman (2015), there has been less research on small-scale local food than on industrial food. Aucoin and Fry developed their concept with an example from Herbert (2005) that explains how people form local food movements due to government failure to provide protection on social and environmental issues.

In developing countries such as Indonesia, WFGs are seen as having the potential to contribute to local food management. For example, in Kulon Progo, the government cooperates with the WFG to maintain local food (Sutarmi, 2016). Inman explains that the group receives benefits from the "production, processing, marketing and waste disposal" practices in their local food systems (Cooperband and Hultine, 2008 cited in Inman, 2015, p. 40). Furthermore, a study by Blumberg explains how Alternative Food Networks provide advantages to group livelihood by maximising the value-added approach (Blumberg, 2018). For Ball (2020), cited in Wright and Annes (2016, pp. 552-553), value-added is defined as "the process of differentiating the raw agriculture product or commodity", "and includes processing raw products into other goods". In Indonesia, the government has introduced a local food diversification programme (Poppy Arsil, 2014). According to Kinasih, Subejo, and Witjaksono (2014), four success factors determine why members formed a WFG in Bantul, Indonesia: practising local food diversification due to income; active involvement in counselling; rice price; and perception of local food.

### 4.1.3. KWT in Indonesia

Previous research in Indonesia that has focused on KWTs can be grouped into several topics: women and income, participation, local food development, and WFG empowerment. The first topic relates to women and income (Da Costa, Falo, & Nubatonis, 2016; Dewi, 2013; Nasir et al., 2019; Rosmiati, Maulani, & Dwiartama, 2018; Warga, 2016). In KWTs, the members consider several factors such as time allocation, leadership, collective action, (meeting) intensity, and knowledge (Da Costa et al., 2016). KWTs are believed to play a role in increasing members' income (Dewi, 2013; Warga, 2016). Processing *mocaf* is an example of increasing revenue in a KWT (Rosmiati et al., 2018).

The second topic is participation (Fauziyah, 2017; Fitri & Suhifatullah, 2013; Kusmiadi & Musyadar, 2014). For example, research on WFGs has been conducted with a focus on the Kawasan Rumah Pangan Lestari (KRPL) programme in Bogor (Fauziyah, 2017). Following Lestari and Setyaningsih, KRPL can be translated as Sustainable Reserve Food Garden Area (Lestari & Setyaningsih, 2018).

The third topic is local food development (Ani, 2017; Usdyana, Ahmad, & Yusuf, 2018). Previous research has been conducted on a WFG in Kulon Progo, focussing on local wisdom in developing the concept of local food from a sociological perspective (Ani, 2017). This research explored what strategies and efforts are practised by WFGs. Ani's study shows that the two factors of knowledge and adaptation stand for essential elements. According to Ani, knowledge is a crucial factor in developing potent local food combined with local wisdom. For Ani, adaptation is supported by diversification and promotion. Further, she argues that the key to her research group's success is how they are managing local food by maximising the group's function in terms of learning, cooperation, and production space.

The fourth topic is empowerment (Kolo & Hutapea, 2016; Minarni, Utami, & Prihatiningsih, 2017; Purnamasari, 2014; Sulandari, 2016; Syarif, 2018; Yuliana, 2017; Yusuf, Rosalin, & Usdyana, 2018). Two studies have discussed WFGs and empowerment (Purnamasari, 2014; Sulandari, 2016). While Purnamasari focused on women's empowerment through WFGs, the group impact, and supporting factors (Purnamasari, 2014), Sulandari argued that there are four important economic empowerment strategies to develop WFGs: potent, coaching, production enforcement, and marketing strategies (Sulandari, 2016).

## **4.2. METHOD**

### **4.2.1. Study area**

This study was conducted in Kulon Progo regency in the western part of Yogyakarta Special Province in 2017-2018. According to BPS Kulon Progo's population projection, this regency had 425,758 people in 2018 (Badan Pusat Statistik Kabupaten Kulon Progo (BPS-Statistics of Kulon Progo Regency), 2019), with a population density of 726 people/km<sup>2</sup>. Kulon Progo was selected as the research location for several reasons. First, this regency has a higher poverty rate (18.3 %) than other regencies and a municipality in Yogyakarta Special Province ("Angka kemiskinan Kulonprogo tertinggi di DIY," 2019). Second, Kulon Progo had several food insecure villages in Yogyakarta Special Province in 2015 (see Widiyanto, 2018). Third, regarding food security, the government of Kulon Progo advocates local food utilisation through WFGs (Sutarmi, 2016). KWTs in Kulon Progo are expected to actively address these issues.

### **4.2.2. Data and methods**

The primary data for this chapter were collected from interviews with several leaders from selected WFGs in Kulon Progo, which were chosen purposively, based on previous data and information provided by Badan Ketahanan Pangan dan Penyuluhan DIY or The Yogyakarta Special Province for Food Security Agency and Extension (BKPP DIY). Other data sources comprised interviews with a government officer from Dinas Pertanian dan Pangan Kulon Progo and recommendations from local food academicians or experts of KWTs that are managing to process local food that can potentially provide value-added (Ball, 2020; Wright & Annes, 2016). This study was conducted in eight WFGs, each of which was labelled with a pseudonym, namely KWT A, KWT B, KWT C, KWT D, KWT E, KWT F, KWT G, and KWT H (see table 3.1).

Below is some detailed information about the WFGs. Site 1 is KWT A, located in a rural area that is topographically categorised as a lowland area. Since its establishment in 2011, it has had 24 members. Interviewee (A1) reported that they usually meet on the 20<sup>th</sup> of each month. Site 2 is KWT B, located in an urban area in a transitional region or a region located between upland and lowland Kulon Progo (see BPS, 2008; Widiyanto, 2018). This group was established in 1995 and now has 20 members. Site 3 is a KWT in a rural lowland area, which was established in 1998 and now has 25 members. Site 4 is a KWT in a rural upland area, which was established in 2013 and has 40 members. Site 5 is a KWT in a rural upland area,

which was established in 2012 and has 21 members. Site 6 is a KWT in an urban lowland area, which was established in 2012 and has 21 members. Site 7 is a KWT in a rural upland area, which was established in 2013 and initially had 29 members but now has 44 members. The final KWT is in a rural transitional region that initially had 27 members, but at time of interview, had 32 members. This KWT was established in 2010. Each KWT has its own stories that are presented later in this chapter.

I conducted unstructured or informal and semi-structured interviews (Bernard, Wutich, & Ryan, 2017) or what Kvale called ‘exploratory interviews’ (Kvale, 1996). The interviews were conducted in Bahasa Indonesia (Indonesian language) and sometimes in the Javanese language. This study used data collected from interviews with 18 informants (Table 4.1), comprising three government officers, nine leaders of KWTs, and four members of KWTs. Two informants were husbands of a WFG member and a leader of the farmer group (a male who focuses on local food) respectively. The informants represent what Fonte (2008) categorised as expert and local. Expert informants are represented by the leaders and officers, while local informants are represented by WFG members. The informants were also labelled with pseudonyms.

The questions asked during the interviews were related to the particular issues of local food (Trauger, 2004), WFGs, and their activities based on the interviewees’ experiences. However, during conversation, questions arose from the interviewees’ stories and explanations on the following topics: 1) group characteristics, such as how many members the group has and when it was established; 2) descriptions of local food; 3) where they procure their (raw) materials; 4) group products; 5) experience of participating in or managing the group; 6) women’s activities in the group; 7) how they manage their time; 8) the advantages of participating in the group; 9) who their customers are; 10) where they access knowledge; 11) any problems associated with managing the group; and 12) how problems are tackled. Before conducting the interview, I submit the research permission from Kulon Progo government to the WFGs’ leaders. All interviews with WFG members and farmers’ groups were conducted in the interviewees’ homes, while officers were interviewed in their offices. Before took an interview I also request a permission to record digitally our conversation. The interviews took between 30 minutes and approximately 2 hours. I also attended one WFG (KWT H) monthly meeting by invitation, while another WFG (KWT F) lent me their documents (reports) to show what this WFG did several years ago related to their local food practice.

Table 4. 1. Women farmers group and informants' profiles

Group	Informant Code	Date of Interview
Women Farmers Group		
KWT A	A1	March 2017
KWT B	B1	19 March 2017
KWT C	C1	March 2017
KWT D	D1	20 March 2017
KWT E	E1	29 March 2017
	E2	29 March 2017
KWT F	F1	1 April 2017
KWT G	G1	1 April 2017
	G2	22 October 2018
	G3	22 October 2018
	G4	4 November 2018
	G5	21 November 2018
KWT H	H1	March 2017 & 26 October 2018
	H2	March 2017
Non Women Farmers Group		
Government Officer	O1	15 March 2017 & 24 October 2018
	O2	25 September 2018
	O3	25 September 2018
Farmers Group	FG1	6 April 2017

Source: author compilation

### 4.2.3. Data Analysis

This chapter employs thematic analysis to answer research question 1. In this context, a theme is defined as a “fundamental concept” (Bernard et al., 2017, p. 103). Through data analysis, I attempted to identify key themes expressed by the informants (Angrosino, 2007). Boyatzis proposes using three methods to establish a theme: from adopted theory, previous research findings, or codes adopted from previous research (Boyatzis, 1998, p. 36). There are also induced themes which are derived from the data (Bernard et al., 2017, p. 104). Bernard et al also argue that themes emerge from analysis of interview transcripts (Bernard et al., 2017, p. 105) and they provide a detailed technique to identify themes such as repetitions and similarities (see Bernard et al., 2017, p. for detailed information).

This chapter adopts the Attride-Stirling Thematic Network Analysis (TNA) method, which originated in the health discipline (Attride-Stirling, 2001). Since its introduction in the early 2000s, this framework has come to be employed in the geography discipline (Campbell, Skovdal, & Campbell, 2013; Skovdal & Evans, 2017). The TNA method consists of two main stages (text reduction and text exploration) and is then divided into six steps (see Attride-

Stirling, 2001, p. 391 for detailed information). The first step comprises coding the database; the second step presenting and identifying themes that have emerged from the data; and the third step identifying the three types of theme: basic, organisational, and global. According to Attride-Stirling, basic themes are “lowest-order premises evident in the text” (Attride-Stirling, 2001, p. 388). A group of basic themes is then abstracted into what Attride-Stirling called an organisational theme based on a group of issues that have emerged from the basic themes. Finally, a group of organisational themes is constructed into a global theme. The fourth step is to describe and explore the thematic networks; the fifth step is to summarise thematic networks; and the sixth or final step is to interpret the pattern.

I employed line-by-line inductive coding for the interview text database (Attride-Stirling, 2001; Braun & Clarke, 2006; Saldaña, 2016). To code the data from my interview database, I first transcribed the interview into Microsoft Office and converted it into a pdf file. I then imported the copied files into Maxqda software for coding. I drew the themes manually (Braun & Clarke, 2006; Saldaña, 2016). To identify the themes, I adopted several thematic guidelines from Braun and Clarke, Kvale, and the TNA framework to present the basic, organisational, and global themes (Attride-Stirling, 2001; Braun & Clarke, 2006; Kvale, 1996; Scheele, Little, & Diderichsen, 2017; Spurgeon, Clarke, & Sackley, 2015). I used two methods to identify the themes: first, I identified a-priori themes or themes derived from previous research, and second, I derived emergent themes from the interview data (E. G. Dunne & Kettler, 2008; Gallagher & Schlösser, 2015). Both methods are used in this chapter. Analysis provides a description of similarities and differences between data containing the sub-themes or attributes identified from previous research or a-priori themes (Brooks, McCluskey, Turley, & King, 2015; Carroll, Booth, & Cooper, 2011).

I selected interviewees’ quotations (translated into English) to support the emerging themes (Cairns & Johnston, 2016). For the discussion section, I drew from previous research to demonstrate the relationship between themes (e.g. Cairns & Johnston, 2016; Scheele et al., 2017). To visualise the findings (coding, quotation, basic themes, organisational, and global themes), I followed previous works by Soylu and Sheehy-Skeffington (2015) and Swierad and Huang (2018). Following visualisation of TNA’s result, I drew a conceptual model, a diagram showing the relation between concepts and terminology (Ohtoshi & Gottschalg-Duque, 2016; Suter, 1999). I employed interviewee stories and selected previous works of literature to build a hypothetical conceptual model (Anstey, Tweedie, & Lord, 2016; Hagen & Bogaerts, 2014; Nojavan, Salehi, & Omidvar, 2018; Ohtoshi & Gottschalg-Duque, 2016).

### 4.3. RESULTS

The study presented in this chapter had two main findings: the themes identified from the data and the relations between themes. The first result is presented in Table 4.2 and the second in Figure 4.1.

Table 4. 2. Themes identified from the interview data

Global Theme	Organisational Theme	Basic Theme	
Local food practice	Materiality	Non rice-materials	
		Local food characteristics	
		Free Chemical	
		Origin	
	Functional	Health	
		Cultural practiced	
	Government initiative	Diversification	
		Government concern	
	Local food systems	Local food stock	
		Synergy	
	Identity	Roles of women in their family	
		Roles as a leader	
		Motivation	
	Structure	Obstacles	
Space	Production unit		
	Learning space		
	Cooperation space		

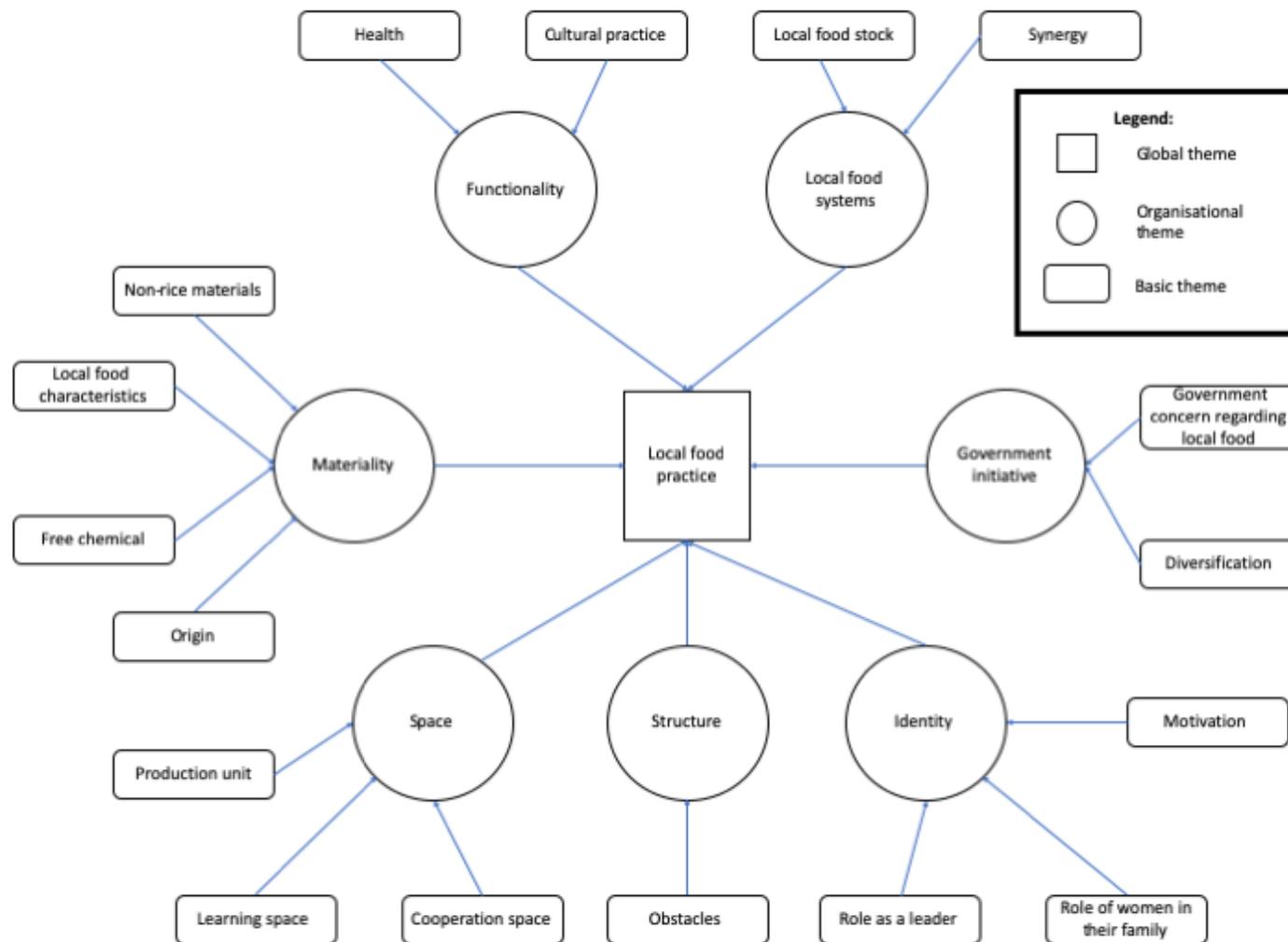


Figure 4. 1. Thematic networks analysis of women farmers group in Kulon Progo

### **4.3.1. The meanings of local food practice**

The findings demonstrate that interviewees had various perceptions of local food and defined local food in multiple voices. Previous studies, for example Brunori (2007), Martinez et al. (2010), Eriksen (2013), Hiroki, Garnevska, and McLaren (2016), and Granvik, Joosse, Hunt, and Hallberg (2017) have examined the meaning of local food. Brunori defines local food “as a force for change in the food system” and categorised into functional, ecological, aesthetic, ethical, and political category (Brunori, 2007). Martinez et al. argue that local food is a geographical concept (see Martinez et al., 2010, p. 3 for detailed information). For Eriksen, local food is divided into three types of proximity, namely geographical, relational, and values (Eriksen, 2013). Following previous scholars, Hiroki et al. define local food from geographical origin, distribution method, and geographical proximity perspective (Hiroki et al., 2016). Sum up from their respondents, Granvik et al. define local food as “the food is produced and sold/ consumed locally” (2017, p. 10).

In this chapter, local food practice was identified as the global theme and supported by seven organisational themes: materiality, functionality, identity, structure, space, local food systems, and government initiative. Materiality consists of four basic themes: non-rice materials, local food characteristics, chemical-free farming, and origin. Functionality consists of two basic themes: health, and cultural practice. Local food systems consist of the theme local food stocks and synergy. Government initiative includes diversification and government concern on local food. Identity includes roles of women in the family, roles as a leader, and motivation. Structure consists of the theme obstacles. Space consists of production unit, learning space, and cooperation space.

The idea of labelling local food practice as the global theme was inspired by O’Neill, Clear, Friday, and Hazas (2019) and Shove and Pantzar (2005). For O’Neill et al., (local) food practice can be seen from the innovation offered by the group, based on their habits and activities (O’Neill et al., 2019). Shove and Pantzar developed their practice concept drawing from Reckwitz and Schatzki. For Shove and Pantzar, practice involves three components: form of competence, meaning, and materials (Shove & Pantzar, 2005, p. 45).

### **4.3.2. Materiality**

Materiality is the first organisational theme that constructed the global theme and was borrowed from Bakker and Bridge (2006), Anderson and Wylie (2009), and Richardson and

Weszkalnys (2014). For example, drawing from Miller's argument, Bakker and Bridge explained that materiality can be observed from the notion of "object, commodities and artifacts, invoking material things as physical constituents of sociocultural practices" (Bakker & Bridge, 2006, pp. 11-12). I identified that the concept of materiality, explained by the three papers above, explains the form of the commodity (Bakker & Bridge, 2006), material (Anderson & Wylie, 2009; Bakker & Bridge, 2006), whether it is natural and organic (Anderson & Wylie, 2009), as well as the cultural and physical forms of things (Anderson & Wylie, 2009; Bakker & Bridge, 2006).

The first basic theme, non-rice materials, was explained by several informants (FG1, G1, E1 and E2). One informant (FG1) mentioned various tubers as commodities planted in his surrounding area, namely *garut*, *ganyong*, *gembili*, *gembolo*, *uwi*, *tomboroso*, *gadung*, *suweg*, *singkong*, *iles*, *telo pendhem*, and *kentang kleci*. Another informant (G1) reported that river fish also form part of their local food menu. Various types of local food are planted in the informants' areas, such as banana and *porang* (E2), ginger and sweet potato (E1), and chilli and vegetables (B1). According to (Khudori, 2008), tubers can be defined as a local food in Indonesia. Moreover, the Indonesian variety of tubers can be used to fill the gap in times of short supply of other food stuffs or 'short supply' and can act as a 'food buffer' (Khudori, 2008; Nawiyanto, 2003, p. 109). This explanation was also evident from two informants' statements in Kulon Progo:

One advantage of local food is that in the dry season, when we face short supply or hunger in the future, we still have stock below ground. So we still have stock from the long dry season for local food, particularly tubers. (FG1)

... here we have this kind of tuber, which has been potential since the past, never utilised or thrown away, but now it is utilised, especially for anticipated food insecurity. (E2)

Basic theme number two is "local food characteristics", such as "marginal land" and "expensive". This theme comprises the place where local food is usually planted. Local food, such as tubers, can also be planted in marginal areas (FG1). One informant (G4) reported that compared with another material (soybeans), her raw material (nuts) is more expensive. She (G4) also reported that some people search for her products because of their rarity.

The third basic theme is that the food is "free from chemicals", which was expressed by several informants (G5, FG1, D1, and A1). One informant (G5) noted that local food is free from chemicals. Further informants mentioned that they prefer to consume material without chemicals from their home garden or other places of origin. For FG1, food without chemicals

is healthy food. Another informant (D1) reported that their group is now eating rice without chemicals and replacing chemicals with natural and traditional pesticides made from *mojo* and *jenu* fruits. One leader (A1) mentioned that they consumed fruits and vegetables without chemicals from what they plant. This practice seems to be an indication of the “post organic” movement (Moore, 2004 cited in Fonte, 2008).

The fourth basic theme is the “origin of local food”. One interviewee (G1) introduced the local concept from the perspective of the source of the materials. She (G1) noted that she bought coffee and roasted it herself. She sourced *pegagan* or local food grass from her home garden and procured nutmeg from her neighbour. She bought ginger from the farmer(s) in Pengasih (a region in Kulon Progo). Interviewees also expressed their opinion regarding the purpose of local food. For one interviewee (G1), local food reflects the availability of raw materials in her surrounding area. She explained in more detail the importance of the geographical concept of local food based on her definition of “local” as an “enclosed area”, which means easy access.

### 4.3.3. Functionality

“Functionality” is the second organisational theme, a concept adopted from Brunori (2007) for whom functionality refers to a food’s health and taste attributes. For this study, I identified and grouped health with a basic themes cultural practices as components of the organisational theme “functionality”.

Regarding the first theme, “health”, several informants mentioned the health perspective of local food (H1, FG1, G1, B1). One interviewee (G1) defined local food from the perspective of its health advantages by comparing wheat and sweet potato.

Basic theme number two is “local spirit” or cultural practices called “*kalau bisa menanam mengapa beli*” or “why buy if I can plant”. According to the informant (O1), the regent has a recommendation programme called “*Madhep Manteb Mangan Pangane Dewe*” or “consuming only our local food produce”. This programme was implemented through a home garden optimisation programme accompanied by the (local) spirit of “why buy if I can plant”. Explanation of this sub-theme can be found in two articles from the regional newspaper (Kedaulatan Rakyat). A WFG practice of planting vegetables in their home gardens provides several benefits, mainly by saving money, providing healthy vegetables, and making the home garden more aesthetic (“Gerakan perempuan tanam sayur, ‘Kalau dapat menanam kenapa harus beli’,” 2017). According to Emha Ainun Najib, an Indonesian national cultural practitioner,

“*madhep mantep pangane dhewe*” is an example of food sovereignty ("Wujud kedaulatan pangan, “Madhep mantep pangane dhewe”, 2013).

#### **4.3.4. Local food systems**

The first basic theme is the “local food stock”. This sub-basic theme emerged from one informant’s (G1) explanation of the stock issue. Under this basic theme, her group (KWT G) defined local food characteristics based on the availability, ease of collection, and abundance of local raw material, and also considered the strategy for future need in case there is a shortfall of stock. She also explained that local means within the regency (Kulon Progo) radius but if limited to the more local category, it means a subdistrict, which is what she called her “local food system”. There are two critical points here: the first is geographical proximity, and the second is the local food system. According to Eriksen’s concept of three proximities (Eriksen, 2013), the definition of local food mentioned by G1 is an example of geographical proximity because radius has some meaning. Therond, Duru, Roger-Estrade, and Richard (2017) define a local food system based on the idea of short-circuit or reducing distance between producers and consumers as a typical of alternative networks rather conventional agriculture, as espoused by Marsden, Banks, and Bristow (2000) and Sonnino and Marsden (2006). One informant (G5) explained in relation to her local food system that she prefers to collect raw material from within a short distance of her production place, which is in line with the short circuit nature of the local food system (Marsden et al., 2000; Sonnino & Marsden, 2006; Therond et al., 2017).

Basic theme number two is “synergy”. For this concept, the sub-theme closely relates to the supply of stock. According to one interviewee (G1), two types of strategy are practised: working together with all members under the production unit principle and collaborating with other farmers to provide for their needs. This practice differs from one attribute of synergy, “member engagement”, as explained by McCartan and Palermo (2017, p. 919), because this group not only cooperates with other members but also with actors from the outside group who support their production. In terms of synergy, deeper exploration is required on which groups practise McCartan and Palermo’s concept of synergy.

#### **4.3.5. Government initiative**

The first basic theme is “diversification”. One interviewee (G1) noted that to diversify, they convert the visual of food from the monotonous shape of original tubers, changing it slightly into for examples as a cake, chips so that people will not recognise the food based on

its configuration. Regarding diversification, one informant (F1) who was a beneficiary of the government diversification programme (according to her, this government programme for utilising tubers into intermediate products such as flour from tubers) noted that her group had received government support for utilising local food. This programme requires the participating KWT to produce an intermediate (a processed products from local food that have longer durability) product, such as local food powder.

The second basic theme is “government concern regarding local food”. One informant (B1) explained that local food is provided as snacks for their meetings. Another informant (D1) noted that local food is provided as snacks for sub-district meetings following the instruction of local government. This is in line with a report from Antara Jogja, a branch of the national news agency (Sutarmi, 2014) and based on government rule number 1 2009 (Bupati Kulon Progo, 2009). In Kulon Progo, it is government policy to use local food when preparing and presenting food for government meetings. This initiative was launched by government activities from the regency to village/sub-district levels and then began as a group-level initiative (Sutarmi, 2014). This policy is expected to give value-added or economic impact to the group or individuals. One interviewee (A1) said:

We consult with BP3K (a counselling agency for agriculture, fishery, and forestry at the sub-district level), BP3K gives us recipes, and then we practice. This aim is to provide snacks for our meeting, as suggested from local food. From what we ever practised, then from the result of the practice, if there is somebody who entrusted them to a small shop (warung) near here or travelling vegetable traders (pedagang sayur keliling, in Indonesian) (A1).

This informant’s (A1) explanation is in line with Suryana’s (2016) finding that local food can give value-added if it is processed.

#### **4.3.6. Identity**

The second basic theme is related to the role of women in their communities and also people or consumers who interested on local food. I labelled this basic theme “identity”, a concept borrowed from Feminist Agrifood System Theory (Sachs, Barbercheck, Brasier, Kiernan, & Terman, 2016) and Tajfel’s social identity theory (Cardona, Sun, Li, & White, 2017)

The first basic theme is women’s roles in the family. One informant (G4) shared the importance of her role as a wife, and said, in particular, that allocating time for a women’s group meeting would not overlap with her time as a wife. This statement is supported by the leader of their group (G1), who said that in their KWT, all members were women with different leisure times. She also thinks it necessary to change people’s mindsets in relation to women

from the previous view that a wife depends on her husband. She expressed her hope that women could be more productive without leaving their families. One informant (H1) told of several groups in their area in which women participate, namely PKK (Pemberdayaan Kesejahteraan Keluarga or family welfare empowerment (for example see Hanis & Marzaman, 2019) for mothers, KWT for tuber production and food processing, and UPPKS (Usaha Peningkatan Pendapatan Keluarga Sejahtera) or a family welfare income increasing program (for example see Heryendi & Marhaeni, 2013) for knowledge on how to market their products.

The second basic theme is “role as a leader”. One informant (G2) related that she had previously been unemployed, before the leader asked her to join the KWT. Soon after that, the leader asked her to run a business (“Mbak ayo dodol”) and she now runs a *warung* (a small shop) that provides local food in front of her house. This basic theme is the ‘double function’ role played by the leader. She thinks she needs more time, particularly to respond to invitations, since more guests are now visiting her group and also their showroom that presenting their WFGs products and also other WFGs products; therefore, she needs help from other members. Paradoxically, however, other members also have new businesses (some of which they developed after joining the KWT).

Basic theme number three is the motivation underlying the management of local food. One informant (G4) identified that local food attracts more people. For instance, from her observations, she said that today officers are more interested in consuming local food than going to a bakery. According to her (G4), consumers prefer to consume boiled sweet potato, *tempe*. One informant (G1) also explained that local food attracts them because it is her mission to prepare local food that is equal to modern cuisine. Guided by the work of Schwartz, Eriksen (2013) defined the values of proximity. Informant (G1)’s view is similar to Eriksen’s finding that “local food emerges as a counterpoint to industrial agriculture” (2013, p. 53). Motivation also relates to smart consumers. One informant (FG1) identified that local food consumers are specific (according to FG1 they are from middle class group and practising healthy life style) because not everyone knows what local food is. He also recognises that his consumers are middle-class people who are motivated to pursue healthy lifestyles. One officer (O2) related to the consumers, saying that customers are smart and when deciding what food to purchase, they consider a food certificate for home industry called PIRT or *Pangan Industri Rumah Tangga* (Goukm.id, 2016). Another informant (G1) also explained that, today, consumers are smart and look for healthy products. I identify consumers who have interacted with the interviewee (G1)

are a group of people who have pride or self-esteem when consuming local food (Tajfel, 1979 cited in Cardona et al., 2017).

#### **4.3.7. Structure**

For the structure organisation theme, I adopt the concept of “structure”, one of three important concepts proposed by Ager (2015). According to Ager, structure relates to barriers. During our interviews, the informants related the obstacles they faced in participating in WFGs. I grouped this finding under the first basic theme, “structure”. There are six sub-basic themes related to the obstacles. The first is the educating factor. One informant (G1) noted the key role of education, particularly for promoting and introducing their products. On giving me an explanation, she said that it can be challenging at first to launch a product, promote its advantages, and inform customers of how to consume it. Later, there are other potential outcomes, but right now she feels that these new products (she introduces chocolate as their new products) will face the same obstacle. In her perception, there is a paradox between ‘healthy and delicious’ products, with most Indonesians preferring the latter over the former. The second sub-basic theme is “financial capital”, which one informant (D1) expressed as a group obstacle. The third sub-theme is “side job”. Another informant (B1) mentioned that financial capital is an obstacle and explained that financial capital is limited because their business is considered a side job. The fourth sub-basic theme is “marketing”, which most of the WFGs mentioned to be an issue. For instance, due to limited consumers in their rural area, a WFG (KWT E) is facing difficulties with marketing their products. Another interviewee from KWT F (F1) expresses their story that their market for the local food product is limited in their surrounding area.

One informant of KWT E (E1) also reported that her inability to ride a motorcycle was an obstacle. The fifth obstacle, “organisational”, emerges from the relative success of WFGs. When more of their group members began to become more successful and busier, she faced difficulties distributing tasks to the members.

According to one leader, one of the obstacles for women in terms of participating in their group is “time”, and this is the sixth sub-basic theme:

I said that our group is not a business group; we have a group. Still, this does not mean that the products must be prepared in one place because we realise that we are a women’s group in which all of us are housewives with different allocated times to take care of our families. We learned from other groups that work together for their products using the same revenue. But here, we realise that is impossible because each member has a different role. (G1)

#### 4.3.8. Space

The organisational theme of space explains the interaction in WFGs as well as the definition of WFG itself. Firstly, one interviewee (G1) reported that their KWT (KWT G) was originally not a business group but has three missions. Firstly, as a learning place where members gather and share. When some members are delegated to attend training, they present what they have learned at their regular meeting. Secondly, as a place of cooperation, meaning that they have created a system where members have roles in providing raw materials. Some members process local food, while others have a role in marketing the products: “We not only focus on local food processing ... but we also explore other potentials, such as crafts or agriculture, forestry, animal husbandry” (G1). Third, as a production unit. For production, the group focuses not only on food processing but on managing their businesses, even if their products are not prepared (each member responsible with her product and produce her product in her home) in one place:

So early on, I said that our group is not a business group; we have a group but this does not mean that the products must be prepared in one place because we realise that we are a women’s group in which all of us are housewives with different allocated time to take care of our families. We learn from other groups that they work together for their products using the same revenue. But here, we realise that this is impossible because each member has a different role. So we considered that our group is somewhat broken and decided that it would be better if the products were made by individuals. (G1)

One member of this group (G4) provided similar information that their group is a place to learn and share information. Another informant (E1) expressed her feeling that their group is not yet successful, pointing out a marketing problem as a driver for this. Another informant (F1) related that their group is a vacuum (no longer active because some members have businesses) due to other activities. A previous study by Feagan explains that a group acts to conduct “place building” (citing Lacy (2000) Feagan, 2007, p. 27) and the role of a group is to improve members’ quality of life from local practices, as conducted in KWT G. Another example that is similar to place building can be found in KWT H, where, rather than sell their products individually, they decided to sell their products collectively through their group (H1).

G1’s explanation is in line with previous research that mentions KWT as a cooperation space (Fitri & Suhifatullah, 2013). Warga also cites KWT as a cooperation space following WFG’s definition from the Agriculture Department (Departemen Pertanian, 2008 cited in

Warga, 2016). Another study also describes KWT as a space for learning, cooperation, and production (Ani, 2017).

In extending the theme of space, I have attempted to explain it by considering the basic theme of origin and the interviewee concept of the production unit. Initially, I focused on providing a description and began by borrowing Dunne’s definition of local food, which is based on “where local food is coming from” (J. B. Dunne, Chambers, Giombolini, & Schlegel, 2011, p. 50). The second argument regarding the importance of where to market local food commodities is adopted from Selfa and Qazi (2005). The third piece of evidence from my interviews shows the relations in spatial distinction among local food practitioners, particularly KWT. The diagrams below show where the raw materials come from, where the commodities are sold through their markets, and what kind of relations are drawn among local food actors, following Widiyanto’s previous studies (Widiyanto, 2018, 2019b).

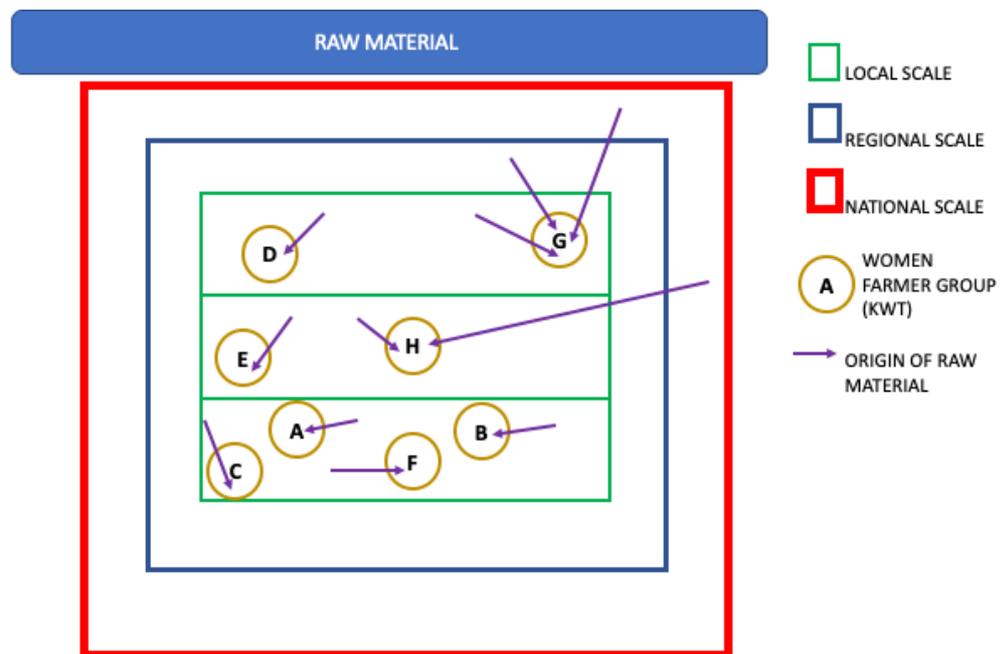


Figure 4. 2. Raw materials in geographical scales.

As seen in Figure 4.2, most KWTs (A, B, C, D, E, and F) obtain their raw materials from the local area, while KWT H procures them not only from the local area but also from the national level (across the province). KWT G obtains raw materials from various locations at the local, regional, and national scales. After that, for example in KWT G, the members processed the raw materials (by using their cooperation space, dividing the process into several sub-groups or “sub-center” as they call) into more value-added local food products, such as

chips or powder. Then the KWTs sell or market these products on their market channels (as illustrated in Figure 4.3).

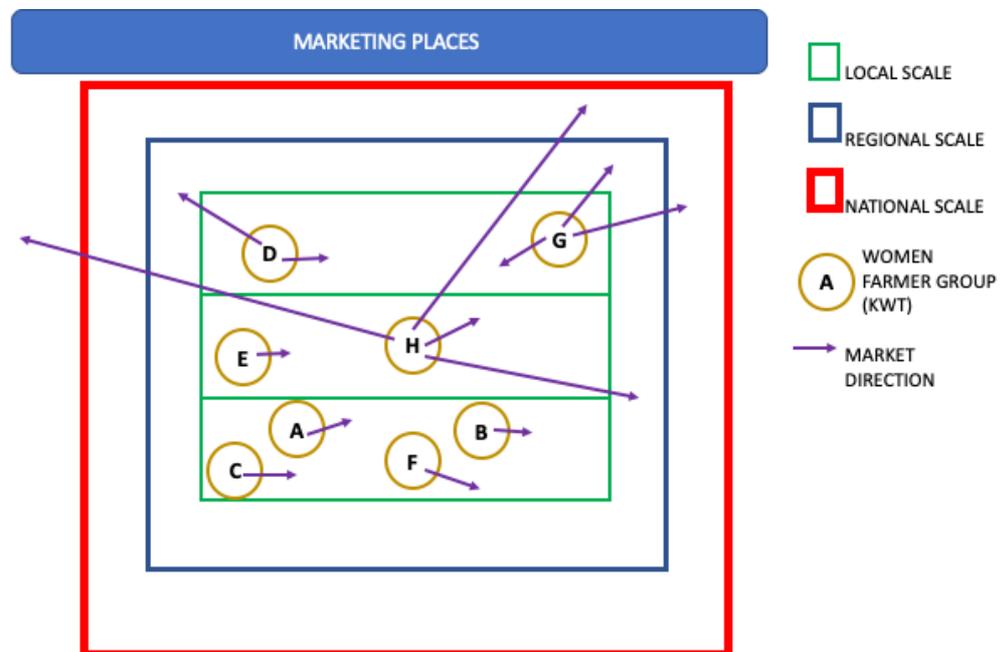


Figure 4. 3. Marketing places in geographical scales.

In Figure 4.3. most of the KWTs (A, B, C, E, F) attempted to market their products at the local scale, but KWT D has also sold its products up to the regional level, while KWT G has widened its marketing channels up to the national level. While KWT H successfully sold their products up to international standard, according to the leader, due to the barriers to certification, her group cooperates with another company. Thus, their products could be sold at the international scale through their partner channels.

To analyse the KWT activities, I borrowed the concept of physical relocalisation for local, locality, and localist food (Brunori, 2007). For Brunori (2007), local food is reflected in consumers and producers who live in the same area and engage in traditional practices. Locality food is from consumers and producers originating in different areas and consumers may come from around the world (Brunori, 2007). Localist food is when consumers and producers live in the same area but do not practise traditional food culture (Brunori, 2007). It seems that of the eight WFGs, KWT A, B, C, E, F are practising local food based on their physical relocalisation strategy, while KWT H practises locality food based on their physical relocalisation strategy. However, I was unable to categorise KWT D and G because both of these KWTs sell their products beyond their area (local scale).

#### **4.4. THE INTERSECTION BETWEEN GENDER AND LOCAL FOOD PRACTICE**

Núñez (2014) explains how intersectionality as a framework is modelled. Intersectionality is applied as an analytical framework because of the interaction between gender and other themes (Davis, 2008 cited in Konstantoni & Emejulu, 2017). Rather than presenting the analysis as an intersectionality model, in this section, I attempt to build a conceptual model from the findings of thematic analysis (Nojavan et al., 2018). Following Anstey et al, and Weiss and Muegge, the preliminary hypothetical conceptual model (Figure 4.4) is developed from the themes and their interrelations combined with the concept mapping technique (Anstey et al., 2016; Weiss & Muegge, 2019).

Figure 4.4 shows that there are some relations between the two topics of gender and local food practices. The gender topic is constructed by two organisational themes: structure and identity. Local food practice is supported by five organisational themes: space, materiality, functionality, local food systems, and government initiative. Structure is borrowed by Ager (2015), identity from FAST (Sachs et al., 2016), and space from interviewee explanations and supported by previous studies from Fitri and Suhifatullah (2013), Departemen Pertanian (2008) cited in Warga (2016), and Ani (2017). Materiality is borrowed by Bakker and Bridge (2006), Anderson and Wylie (2009), and Richardson and Weszkalnys (2014). Functionality is borrowed from Brunori (2007). Local food systems is constructed from local food stocks and synergy (see section 4.3.4 in this chapter). Government initiative consists of government concerns with local food, and diversification (see section 4.3.5).

Borrowing from the concept mapping technique (Weiss & Muegge, 2019), I group structure and identity as a gender topic because these themes are mostly discussed with women's roles and their barriers to managing local food. I assume the relation between the two organisational themes of local food and gender. The critical theory (FAST) proposed by Sachs et al. is key to entering this relationship. I relate this theory with the basic themes of local food organisation (in this study, KWT) and from it, I borrow the concept of "identity", which, for Sachs et al, shows women's roles such as "mother". In their book, two works cited by Sachs et al. (2016), Stone (2007) and McGregor and Tweed (2002) guided my explanation of women's practices in their farmers' groups. According to Stone, women prefer to work at home, but decide to open small businesses or self-employment to fulfil their needs (Hughes, 2003; Stone, 2007a, McGregor and Tweed, 2002 cited in Sachs et al., 2016). This practice is in line with the explanation given by one interviewee (G1) that, in their group, she hoped to be able

to manage their business (from processing local food) at home and support her family's livelihood:

We understood that we are a women farmers group, and the members are housewives. We have a responsibility to our domestic work, so each member has their own free time....It is necessary to change people's mindsets about women, who were previously seen only as wives who depended on their husbands. I hope we are more productive without leaving our families. (G1)

In my proposed hypothetical conceptual model, identity is represented by three basic themes: namely, women in their family, role as a leader, and motivation. I do not include the basic theme of motivation in the gender concept because the motivation theme consists of consumers as the actors; rather I focus on the women. My interviewees, particularly women who have roles as a mother and/or wife, expressed, for instance, their experiences of participating in and/or running businesses related to local food. They also shared their stories related to certain obstacles. Another role undertaken by some interviewees who act as leaders also expresses their experiences and obstacles. For example, G1 expresses their experience not only as a mother but also as a leader of KWT. She (G1) needs to allocate her time for her families and also for her social activity to manage the group and to interact with other parties, such as other KWT, business partners, and the government officers who regularly visit and monitor the local food programs.

On the other hand, I group space, materiality, functionality, local food systems, and government initiative into local food practice for a number of reasons. First, citing Gram-Hanssen, Shove et al, and Hargreaves et al, O'Neill et al explain that 'space might transform practices' (2019, p. 226). Moreover, O'Neill et al identify this transformation (or 'transition' in their paper) through what they called the "sharing space". This notion is in line with and can also be found in KWT activities in Kulon Progo. For example, one interviewee (G4) explained that KWT plays a role as a sharing space from the learning activities or exchange ideas. Moreover, in her definition of sharing space, G4 expresses the advantage of KWT as a sharing space from discussing and solving the problems regarding the marketing issue. She also receives experiences from joining as a member, namely increasing a demand for her local food products. The reason for grouping materiality as one example of local food practice is due to the KWTs' chemical-free production method (Hiroki et al., 2016). Another example is non-rice material. Material is one component to analyse practice (Shove & Pantzar, 2005). In this study, some interviewees shared their stories that although local food is more expensive, it provides them with an economic opportunity. Thus, as an example of local food characteristics, price is

the basic theme of origin. More distance creates a higher price. Therefore, there is a relation between the basic theme of origin and the basic theme of local food characteristics.

Functionality is one component of local food meaning (Brunori, 2007), while meanings, in turn, are a component of practice (Shove & Pantzar, 2005). Following interviewees' explanations, I assumed that their motivation for managing local food is driven by the economic and/or health aspects of local food. The potential of local food supported by interviewees is corroborated by the basic theme of health, which has relationships with several other basic themes. I begin the discussion on local food from the government of Kulon Progo, providing two explanations related to government concerns about health and chemical-free themes, from their support of local food programmes to support of health through the B2SA. B2SA is the movement for a diverse, nutritious, balanced and safe food consumption pattern (Ministry of Agriculture's Food Security Agency, n.d.-a, n.d.-b). To explain this relation, I also borrow from the regent jargon "Madhep Manthep Mangan Pangane Dhewe" (translated into "steady to eat our own food") which is implemented locally through the local spirit theme, such as "Isoh Nandur Ngopo Tuku" (translated into "if we can plant why we buy") (O1). Interviewees believe that there are several advantages to planting themselves, such as reducing expenses and ensuring the quality of the plant through what they call "organic" treatment.

Consequently, this practice and belief from the interviewees' perspective create a two-way relation between the health and local spirit themes. Health then has a relationship with the local food prospect, according to interviewees. The basic theme of government concern has two bonds with other themes. The government pays attention to the diversification from their empowerment programme through diversified local food. Another relationship is also reflected in the government's effort to support cooperation among KWTs from the local food association, which has been initiated by the government and some KWTs.

Extending from the basic theme of cooperation and following from an interviewee explanation, I assume that there is a relationship between synergy with local food systems. In building their local food systems, interviewees also pay attention to the basic theme of origin. This can be explained from the interviewees' stories, particularly regarding how they manage their stocks and where the raw material comes from to support their local food systems.

Following the idea of Swierad and Huang (2018), the conceptual model plays a role in presenting future research. Regarding its limited findings from the conceptual model, future research is necessary to test the conceptual model statistically. This research can be employed in Kulon Progo by adding more respondents (other KWTs).

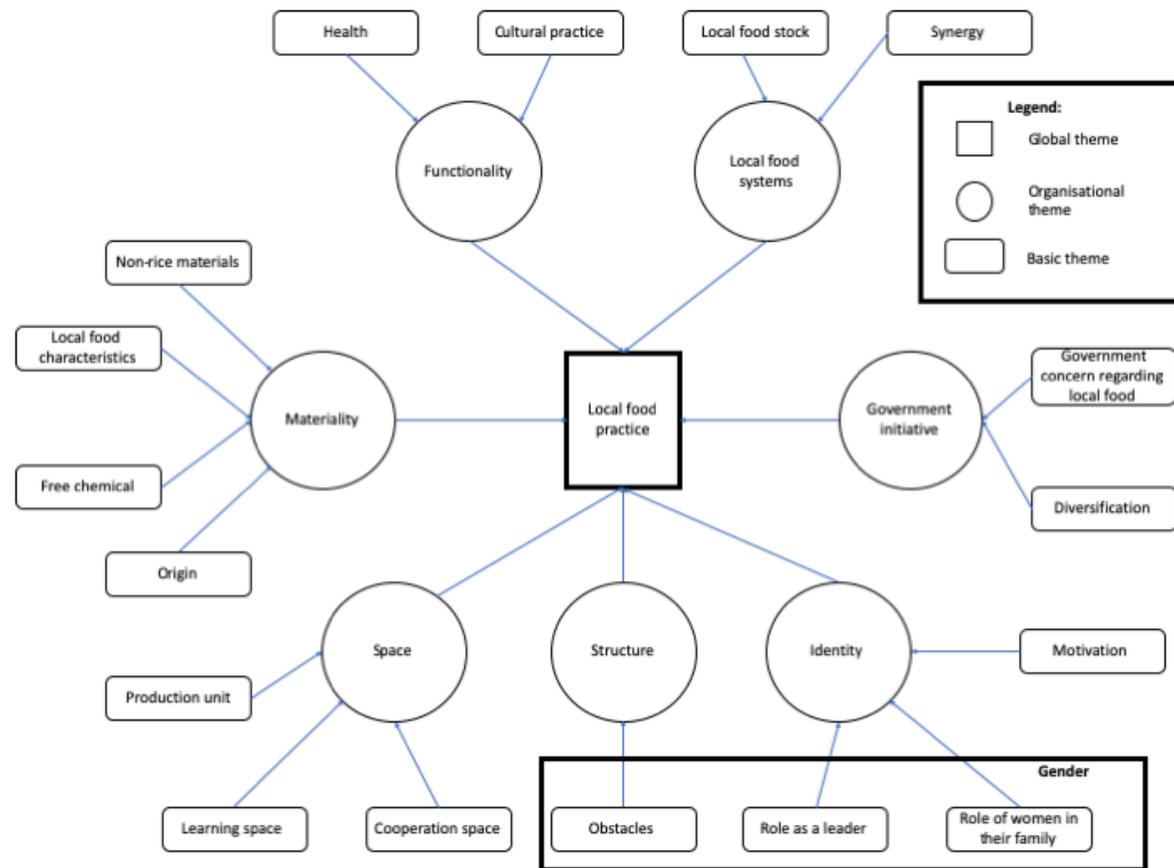


Figure 4. 4. Preliminary hypothetical conceptual model of WFGs in Kulon Progo

## 4.5. CONCLUSIONS

This chapter has identified two critical issues based on WFGs' experiences in Kulon Progo: gender and local food practice. I situated these issues by rearranging the global theme of local food practice and selected two organisational themes of identity and structure for the topic of gender. I then constructed a hypothetical conceptual model demonstrating a relation between gender and local food practice. This chapter has also demonstrated that there are relations among the identified themes. Local food in this research setting is defined according to functional meanings (Brunori, 2007). Issues such as being healthy and free from pesticide were the primary concern of interviewees in terms of producing and consuming local food. From the practical side, this case study found that two selected WFGs have a 'non-local food' function, or are locality food (Brunori, 2007). It can be identified that, although they produced their products locally, they are also using raw materials that are not from their local region. This is not in line with the definition of local food in the Finnish context, which "... uses raw materials and production inputs from their region to enhance the local economy and employment" (Lehtinen, 2012, p. 1056). Kneafsey et al (2013), quoted in Granvik et al, define local food as "commodities that are produced and processed within a defined geographic area in which the distribution chain will be short between producer and consumer" (Granvik et al., 2017, p. 3). However, this research found that interviewees not only sell their products nearby instead of at the regional, national, and/or international levels (Figures 4.2 and 4.3), but WFGs in Kulon Progo also seem to practice what Brunori calls "locality food" (Brunori, 2007; Lehtinen, 2012, p. 1056).

This chapter makes two contributions. First, it extends the discussion on gender and local food practice in its microscale analysis, in a KWT context in developing countries (O'Neill et al., 2019). Secondly, it enriches the discussion of local food from the practice approach, materiality, and resources geographies (Anderson & Wylie, 2009; Bakker & Bridge, 2006; Shove & Pantzar, 2005). However, this chapter has several limitations; for instance, it lacks quantitative analysis due to its focus on qualitative analysis. Qualitative analysis could potentially be conducted based on theoretically driven rather than data-driven analysis, as presented in this chapter (Bernard et al., 2017). Other actors who actively engage in local food systems, for example, consumers and distributors, should also be included in a future study.

Therefore, future research could be conducted in advance, by, for example, examining the themes, and tested by using statistical methods to identify and explain what factors

contribute to women farmers' community development. First, particularly from the hypothetical conceptual model of local food meanings from a women's perspective, the hypothetical relation between the two topics of gender and local food practised should be tested further. What kind of relationships of these dimensions should be tested statistically in geographical settings in Kulon Progo or other regions? Secondly, qualitative research based on theoretical drivers of gender and local food practice is required to confirm or develop the findings of this chapter.

# CHAPTER 5

# CHAPTER 5. PRACTICES AT SMALL COMMUNITY MARKETS IN YOGYAKARTA: THE THIRD WAVE OF INDONESIA'S FOOD MARKETS

## 5.1. INTRODUCTION

In Indonesia, there are several types of food markets that can broadly be classified into traditional and modern (Dyck, Woolverton, & Rangkuti, 2012). The modern type includes hypermarkets, supermarkets, mini-marts, and other similar modern retailers, whereas *warung*<sup>1</sup>, semi-permanent stands, traditional wet markets, and peddlers represent the traditional type. Traditional markets (commonly called *pasar* in Indonesian) have served people's daily needs in Indonesia for centuries (Tumbuan, Kawet, & Shiratake, 2006), and the government has developed traditional markets in both rural and urban areas (Shepherd & Schalke, 1995). In these markets, consumers can buy fresh food such as vegetables and fruits and other items to meet their daily needs (Tumbuan et al., 2006). These traditional markets sell local food with its characteristic "food quality and freshness" (Ostrom, 2006, p. 66). In addition, modern supermarkets have served Indonesian customers since the 1970s (Chowdury, Gulati, & Gumbira-Sa'id, 2005; Dyck et al., 2012; Suryadarma et al., 2010), as have hypermarkets since the end of the 1990s (Dyck et al., 2012).

A third market type – and the focus of this chapter – is the small community farmers' market (FM). This rather new market could be defined as a third wave<sup>2</sup> of Indonesian market styles, with the traditional markets being the first wave, and the modern super- and hypermarkets being the second. FMs in Indonesia<sup>3</sup> can further be classified into two types, depending on their initiators: 1) FMs initiated by the government (Handayani, 2014), also known as *pasar tani* and 2) small community markets or FMs initiated at the grassroots level. The second type is the focus of this chapter. The first FM was most likely initiated on 16 December 2006 in Bali (Ubud Organic Market, n.d.). According to my interviewees (M1, V8), the second group of small community market initiatives started in Yogyakarta in 2012, and

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<sup>1</sup> A *warung* is a "small store, usually 25–50 square meters, one story, sometimes built in front of residential houses, sometimes in 'shopping areas/streets'" (Rahtz & Sidik, 2006, p. 277).

<sup>2</sup> This third wave can also be seen as a kind of revival of traditional markets, with their focus on face-to-face interactions between producers and sellers.

<sup>3</sup> These markets are also called alternative, healthy, and community markets. The interviewees in this study used the term "farmers' market", which I also deploy in this chapter.

another community market was established in Bandung about two years later (Dwiartama et al., 2017). In 2016, a market, *Pasar Papringan*, was set up in the rural community of Temanggung ("Lokomotif gerakan membangun desa," 2017). FMs are located in urban areas such as Jakarta, Bogor, Bandung, Yogyakarta, and Surabaya, and sometimes in more rural areas, such as in Temanggung and Bali, where they are related mainly to tourism.

Previous research on FMs has concentrated mostly on consumers or producers/vendors (Hinrichs, Gillespie, & Feenstra, 2004; Schmitt, Dominique, & Six, 2018). This chapter aims to describe the meaning of local and healthy food from the perspective of the vendors and managers at the FMs, to analyze the practices and mechanisms by which FMs guarantee the localness and healthfulness of their products, and to discuss the significance of alternative food markets in the context of a developing country or urbanizing society by focusing on the production and supply side. FMs are still small-scale activities in Indonesia, and a better understanding of their context should help to fill the urgent need for research on FMs in developing countries (Chiffolleau, 2009). This study thus focuses on the supply-side perspective of the vendors and managers who operate the FMs.

Specifically, this chapter explores: (1) the meaning of localness of the products sold at the FMs, especially as it is interrelated with quality, health, and food in Yogyakarta's FMs, (2) the vendors'/managers' motives for using FMs, and (3) the mechanisms that underpin the FMs, paying particular attention to the practices of vendors/managers as the principal actors in these communities. The article first reviews the relevant literature and conceptual framework of local food initiatives and FMs and then explains the methods used. It then presents an overview of Yogyakarta's FMs and discusses the interview results, particularly as they relate to proximity, relationships, vendor/manager motivation, and market mechanisms.

## **5.2. LOCAL FOOD INITIATIVES AND FARMERS' MARKETS**

Le Heron (2016) categorised agrifood into three main themes, namely "Global Commodity Chains (GCC), Food Regimes (FR), and Alternative Food Movement and Networks (AFMN)" (p. 57). The last one is the main focus of this study. Constance, Friedland, Renard, and Rivera-Ferre (2014, p. 5) discuss Alternative Agrifood Movements, focusing on "local and regional food systems"; they include FMs as part of their case studies. Also, Barbera and Dagnes (2016) identified the importance of proximity, health, and safety as they relate to

agrifood products and networks. Two sections below are a brief literature review discussing local food initiatives and farmers' markets, and local and healthy food at farmers' markets.

### **5.2.1. Local food initiatives and farmers' markets**

Local food is increasingly seen as an alternative to global food (Heis, 2015; Jung & Pearson, 2014; Kimura & Nishiyama, 2008; Lehtinen, 2012; Yokoyama & Sakurai, 2009). Worldwide, local food initiatives began to spring up in the 1970s (Lehtinen, 2012). Examples include *Chisan-Chisho* (Locally Produced, Locally Consumed) in Japan, Food Miles in the United Kingdom, Slow Food in Italy, *Shintobuli* (Body-Soil Inseparable) in South Korea, Community Supported Agriculture (CSA) in the United States, and Rural Regeneration Programs run by the Jia-Nan Cultural Association in Taiwan (Cheng, 2016; Jung & Pearson, 2014; Kimura & Nishiyama, 2008; Yokoyama & Sakurai, 2009). Many studies have discussed the connections between FMs and local food initiatives. For example, a study of more than 120 community food projects in Ontario, Canada includes FMs as an example of local food initiatives (Mount et al., 2013). FMs act as an alternative food space (Bosco & Joassart-Marcelli, 2018) and play a role as outlets for local and healthy food (Engelseth, 2016; Hammer, Vallianatos, Nykiforuk, & Nieuwendyk, 2015; Printezis & Grebitus, 2018).

Inspired by European agrarian markets, FMs were first established in the USA, specifically in Boston in 1634 (Robinson & Hartenfeld, 2007, p. 35). From 1960 to 1970, modern FMs were re-introduced with the spirit of "healthfulness and freshness of foods" (Gillespie, Hilchey, Hinrichs, & Feenstra, 2007, p. 65). Basil (2012) explains the development of Canada's FMs and how they regained popularity in the 1970s, largely owing to environmental concerns. In the UK, the first FMs emerged in Bath in 1997 (Kirwan, 2006; Spiller, 2012; Youngs, 2003).

In developing countries, however, markets developed differently from developed countries. In many places, some type of traditional market, such as a wet market, still retains the essential food-supply role for city and village dwellers on the basis of food supply chains involving local farmers, not only as product distributors but also as retailers. The influence of the Western lifestyle and a rising middle class in Asian cities have changed people's buying habits (De Jong et al., 2017). Food safety concerns related to traceability, accountability, and quality are reasons why Asian customers increasingly prefer to buy food at modern-type retail stores, which are viewed as being more hygienic (Chowdury et al., 2005; Dyck et al., 2012; Ehlert & Voßemer, 2015). At the same time, in larger cities and metropolitan areas, an

alternative type of FM, seemingly similar to those in Western developed countries, is beginning to emerge.

### **5.2.2. Local and healthy food at farmers' markets**

Regardless of the different definitions of local food held by different food protagonists, there is clearly at least an informal association between the concepts of *local* and *healthy* at FMs. Eriksen (2013) argued that “there is no consistent definition of ‘local food’”(p. 49), but defined local food on the basis of three types of proximity: geography, social relations, and values. Other definitions have been offered by Granvik, Joosse, Hunt, and Hallberg (2017) in Sweden, and by Tchoukaleyska (2013), who examined these concepts in France’s FMs. Connell, Smithers, and Joseph (2008) discussed how “good food” meant various things to their interviewees from FMs in British Columbia, Canada, but the meanings shared two basic aspects: a local theme and health-related issues.

Several scholars have defined FMs and their relationship to health issues. For example, Sadler (2016) defined FMs as “ideal sites for nutrition and food security programming because they primarily offer healthy foods”, pointing out that “interpersonal relationships with vendors offer the opportunity to learn more about the food being purchased casually” (p. 120). Hammer et al. (2015) explained that FMs are places where consumers obtain local and healthy food, and Granvik et al. (2017) noted in their review that “local food is fresher and healthier than conventional food” (p. 2).

### **5.2.3. Motivations and mechanisms of vendors and managers underpinning FMs**

There are two motivations for vendors to participate in FMs: social and economic (Feagan, Morris, & Krug, 2004; Hinrichs, 2000). According to Migliore, Caracciolo, Lombardi, Schifani, and Cembalo (2014), farmers participate in Civic Agriculture or FMs because of (social) embeddedness. The concept of embeddedness was first introduced by Karl Polanyi (1957/2001) and later adopted by several scholars (Block, 2001). Granovetter (1985) found that there was an “impact of such change on the social relations in which economic life is embedded” (p. 507). Fred Block (1990) expanded on Granovetter’s work, explaining social relations with the terms “instrumentalism” and “marketness” (p. 53). Higher instrumentalism shows that an actor tends to maximize economic goals, whereas higher marketness shows that price is the critical factor (Block, 1990; Galt, 2013; Hinrichs, 2000). In a study of Community

Supported Agriculture, Galt (2013) stated that both low instrumentalism and marketness are evidenced in customer behaviors. Consumers paid attention to neither price nor economic motives; rather, they emphasized social embeddedness or a sense of “moral economy” (p. 348). Bloom and Hinrichs (Bloom & Hinrichs, 2011) explained the role of social relations and trust in social embeddedness. In short, they said that it was the interrelationship of the three concepts of embeddedness, instrumentalism, and marketness that drives farmers to participate in FMs (Hinrichs, 2000). Moreover, Bloom and Hinrichs (2011) explained how interorganizational coordination mechanisms (formal and informal) can be explained by social embeddedness, particularly as it relates to social relations and trust. Trust and social interaction drive social embeddedness (Classens, 2015; Trupp, 2017), with face-to-face interactions leading to trust (Milestad, Bartel-Kratochvil, Leitner, & Axmann, 2010).

### 5.3. METHODS

The data for this study were obtained from in-depth unstructured interviews, combining “informal and ethnographic interviews” (Bernard et al., 2017, pp. 74-76) with 12 FM vendors and managers from the 6 FMs that I visited (Table 5.1). Of the 17 people contacted, 14 people agreed to meet, and 12 agreed to be interviewed. They included 8 vendors, 3 vendor/managers, and 1 manager. They were intentionally sampled based on the snowball-sampling method (Bernard, 2006). The interviews were conducted between September and November 2017.

Table 5. 1. Informants’ details (own compilation)

No	Code	Role at the FM	Date of interview (day/month/year)	FMs
1	V1	Vendor	21/11/17	FM1
2	V2	Vendor	17/11/17	FM2
3	V3	Vendor & Manager	22/11/17	FM2
4	V4	Vendor	25/11/17	FM6
5	V5	Vendor	3/10/17	FM2, FM3, FM4, FM6
6	V6	Vendor	14/11/17	FM1
7	V7	Vendor	23/9/17	FM4
8	V8	Vendor & Manager	7/9/17, 28/9/17	FM5, FM6
9	V9	Vendor & Manager	14/11/17	FM1
10	V10	Vendor	15/11/17	FM3, FM5, FM6
11	V11	Vendor	20/9/17	FM3, FM4
12	M1	Manager	22/11/17	FM3

Two main questions guided the interviews: (1) Could you explain your experience (individually) as a vendor or manager or both? and (2) Could you tell me what the farmers' market is? The questions that followed were related to thematic issues such as proximity, motivations, prospects, challenges, historical stories, and interactions with other actors such as producers and traders. Sometimes, the informants told related stories about their businesses and the FMs themselves, even though I had not directly asked about them. I would then raise questions related to their stories. The conversations were conducted in Indonesian and sometimes Javanese languages, taking from about 15 to 120 minutes. The interviews were digitally recorded, later transcribed into written text with the interviewees' permission and finally translated into English. Not all parts of the conversations were transcribed because some parts (such as general chatting) were unrelated to the research focus. At the end of the interview, I asked the informants for permission to observe them at their respective FMs and to inform others about my presence. To analyze the transcribed text, I also was guided by Phillips and Hardy's (N. Phillips & Hardy, 2002) work on discourse analysis. With this strategy information (e.g., the meaning of local food) derived from the interview and story-based data can be analyzed qualitatively by developing and examining codes and categories (N. Phillips & Hardy, 2002). For this chapter, I present results from the analyzed and coded textual data. The first result (Figure 5.1) contains information reconstructing the food supply chains, and helps to describe and analyze where the raw materials originated. I classified the areas into three spatial scales (Sallie A. Marston et al., 2005; Taylor, 1982, p. 24), namely Greater Yogyakarta (GY), the province, and out of the province. I also describe where the original raw materials come from by adopting the supply chain diagram of Ilbery and Maye (2005b). I also analyzed the transcribed interview texts (Bernard, 2006) as the second result to show what the informants' discourses are by intentionally selecting typical examples.

## **5.4. RESULTS AND DISCUSSION**

This section is divided into five sub-sections. First, the overall structure of the FMs is presented. Then, the meaning of local and healthy food as expressed by the practices of the vendors and managers is evaluated. Next, the concept of proximity is explored, particularly as it relates to supply chains. The fourth sub-section examines the motives of the vendors and managers, and the fifth looks at how non-local food is perceived to be local through the concept of health. Finally, the mechanisms underpinning the FMs are described.

### **5.4.1. The landscape of Greater Yogyakarta FMs**

I summarize the history of the FMs based on my conversations with the interviewees. The first FM in Yogyakarta was established in 2012. The second and third FMs were set up in 2014, and these were followed by the establishment of four more FMs in 2016 and three more in 2017. By 2017, a total of 10 FMs were established in GY. Each FM is autonomous; so although there was once an FM association in Yogyakarta, it was no longer in operation at the time of the interviews. Each FM has its own management style; for example, FMs can employ a communal system or group-based management, but some are managed by a single manager or leader.

My observations indicate that the FMs have a hybrid physical appearance that combines aspects of traditional and modern markets. Two commonly used spaces for the markets are restaurants and houses. The prices of products at FMs are fixed, so there is no apparent bargaining system. Customers can choose to pay some vendors in cash or by an e-payment or other type of digital payment; these transactions are therefore similar to those used in a modern supermarket. Human interaction is a common characteristic of all of the FMs because the face-to-face interaction with customers is desired. Most of the commodities sold in the FMs are advertised as local and are promoted as being healthy. The products are presented in various types of packaging; the packaging used for artisanal products is particularly attractive.

Each FM has a different vision and mission, but in general they aim to educate people (producers and consumers) about food (V8), particularly about healthy food and sustainable food systems. One informant (V8) said that one of their big dreams was to achieve food sovereignty in Indonesia, whereas another stressed that he wanted to provide organic, healthy, fresh local products. The goal proposed by the informant is similar to the emerging food sovereignty activities in today's Southeast Asia (Voßemer, Ehlert, Proyer, & Guth, 2015). Another informant (V7) told me that the market should provide responsible products, use fair practices, and be accountable to achieve the vendors' vision and mission.

The FMs open variously twice a week, once a week, twice a month, or once a month, each with its own market day(s) and in general operate three to four hours. Yogyakarta's FMs are also characterized by selling two kinds of products: "wet" products and durable products (V8). The GY FM community defines "wet" products as fresh food, ready-to-eat food, snacks, fruits, and vegetables. Durable products refer to foods that can be kept for a relatively long time, such as soybean sauces, coconut oil, and fermented drinks or beverages.

There are several types of actors participating in Yogyakarta's FMs. The first are the vendors. On average, there are 10 to 25 vendors at each FM. According to Stephenson, Lev, and Brewer (2008), FMs consisting of fewer than 30 vendors are categorized as small FMs. A vendor can be a farmer, a producer, or a trader of food products. Lyson (2004) defined three types of vendors in their case study: (1) "traditional full-time farmers"; (2) "part-time growers and market gardeners"; and (3) "local artisans, craftspeople, and other entrepreneurs" (pp. 92-93). My fieldwork showed, however, that the vendors at Yogyakarta's FMs are dominated by the third type: local artisans and craftspeople, and food processors or food entrepreneurs – but very rarely farmers. The vendors categorized as food processors usually buy raw materials and process these into finished products such as traditional foods and beverages, bread, and other healthy foods to sell at the FMs. Some of the vendors also produce or process artisanal food.

The second type of actor includes the managers or leaders. A manager or leader can be an initiator of the FM or a representative selected by the vendors. The manager may operate her/his stall during the market days or execute management tasks without working in a stall. The third type of actor is the host, who is usually the owner of the space where the FMs are regularly held. The host may be a third party who does not sell commodities, but he or she often has a good understanding of the FMs' activities. The fourth type includes the producers and suppliers who regularly support the vendors' needs, and the final actors are the consumers. During my observation, I identified that the consumers are local residents, domestic and international tourists.

#### **5.4.2. The meanings of local and healthy food**

Proximity and the supply chain are two ideas that permeate the local food literature (Eriksen, 2013; Giampietri, Finco, & Giudice, 2016). Similar to the findings of previous research (Eriksen, 2013), I found no apparent consensus among the vendors and managers regarding the meanings of local and healthy food. Each vendor has a good knowledge of local geography; such knowledge is essential to their understanding relating their materials (Chang & Lim, 2004). One vendor (V3) explained where their raw materials came from and noted, for example, that a particular vegetable was from upland Magelang (not too far from Yogyakarta) and that some raw materials such as flour and tea originated in Java. A geographically wide but limited context is also important in understanding the idea of local. This critical point was supported by two informants (V3, V8) who explained that, although their raw materials come from Java, they were still considered to be local. Other informants explained that the term

‘local’ also applies to locally grown commodities that were not originally grown in Java: “Like broccoli, these are not vegetables from Java. But they can still be considered natural because they have become naturalized in this area and have been grown here with no problem (M1)”. Finally, nostalgic food (“Indian flavours are my identity: Chef Ranveer Brar takes us on a nostalgic food ride,” 2019)– for example, food that close family members have traditionally eaten – is also considered to be local. One informant (V8) mentioned ‘nostalgic food’ talking with a pedicab driver who said that the food (contained *kimpul* and *canthell* sorghum) the vendor sold was “like his grandparents’ food”.

Several points were identified as related to the concept of health: (1) clarity in the specifications of the raw materials and processes (V5), (2) chemical free (V9, V10, V11), (3) supporting a healthy lifestyle (V2), and (4) similar to ancestral food (V8). A vendor who provides dairy products explained his belief that clarity in the specification of raw materials and processes contributes to health as follows:

We, and our friends in the organic market of the natural food market community, have two principles: specification of raw materials and transparency of processes. If we want organic, sometimes it’s difficult. There are so many requirements: You want natural? That’s more difficult than organic. (V5)

Several informants paid attention to the concept of chemical-free when defining their products as healthy. When I asked one of them to explain, she said:

The best food is what we plant. We know what we use for production in the garden, I mean, what we use for cultivation. We give the best: the best is natural and doesn’t contain drugs or chemical elements; the consequences of unhealthy farming practices will return to us and to what we eat. (V11)

One informant responded to my question regarding what is healthy food by saying that “We have never said that our menu is a diet menu. These foods are healthy and balanced for those people who are concerned with having a healthy life” (V2). Another informant told me that healthy food is the food his ancestors ate: “We just interpret it as: What we eat has been consumed by our grandparents” (V8).

### **5.4.3. Defining proximity for material supply chains**

In the previous section, the informants expressed their perceived meanings of local and healthy food. It is clear that these respondents paid attention to where the raw materials come from. In this section, the local concept will be explored through Eriksen’s (2013) three types

of proximity: geography, social relations, and values. In this quote, one informant explained the origin of his materials by describing the various distances of the source from Yogyakarta.

I bought tea from Kendal . . . that is the farthest . . . However, for the fruits, I bought them all from my friends, who supply them. For cinnamon and spices, I have suppliers from Menoreh, but sometimes they are not always ready to supply them . . . Moreover, the vegetables are from Merbabu north of Jogja, the chilis are from my friends in Jogja, and a lot of the other food is also supplied from Jogja. The dragonfruit comes from here, from Jakal an area in Jogja<sup>4</sup>. There is a dragonfruit garden there, but because it is seasonal, I sometimes . . . go to the market trader. For other products, I still use imported products. (V7)

Another informant explained the distance of the raw material from the market and defined a specific distance to be local: “As far as I know, the standard of ‘local’ is 100 km from the node where the source is available, in other words, within a circle of 100 km” (M1). The same informant describes the role of friends in explaining relational proximity: “They bought materials from their friends. Their supply comes from their friends, and the food sellers provide lunch for their friends” (M1).

The informants mention many values in addition to health, including those related to local food. This informant, for example, describes his value perceptions and prioritizes the values:

For me, to educate them [consumers] I should be patient and we must progress step by step . . . For us in Indonesia, mostly halal is the first priority, then health, environmentally friendly, and organic. We must patiently educate them [consumers] one by one about the products. (V1)

Another informant explained relational and value proximity in this way:

For the new vendor(s) that I try to look for and accommodate . . . I persuade my friends to join. When there is a friend(s) who has a good product and can be responsible, we invite them to join. Consumers need variation, and we also need more vendors. If many vendors come, the market will not shrink. (V7)

Generally, local food conceptually correlates with a geographically short food supply chain or a short distance from the source materials (Giampietri et al., 2016). However, according to my fieldwork in Yogyakarta’s FMs, examples of short geographic distances indicating ‘local’ were given only by two vendors (V2 & V7). Most of the sources were outside GY (either within the province or outside of the province; see Figure 5.1). Some vendors reported that some of their materials were obtained from traditional markets or were even

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<sup>4</sup> The informant explained Jogja refers to Yogyakarta Special Province.

imported, but they did not give any information regarding the specific geographic locations of such sources. Overall, the second and third parts of Eriksen's elements of proximity (relationships and values) were demonstrated by the vendors in GY FMs.

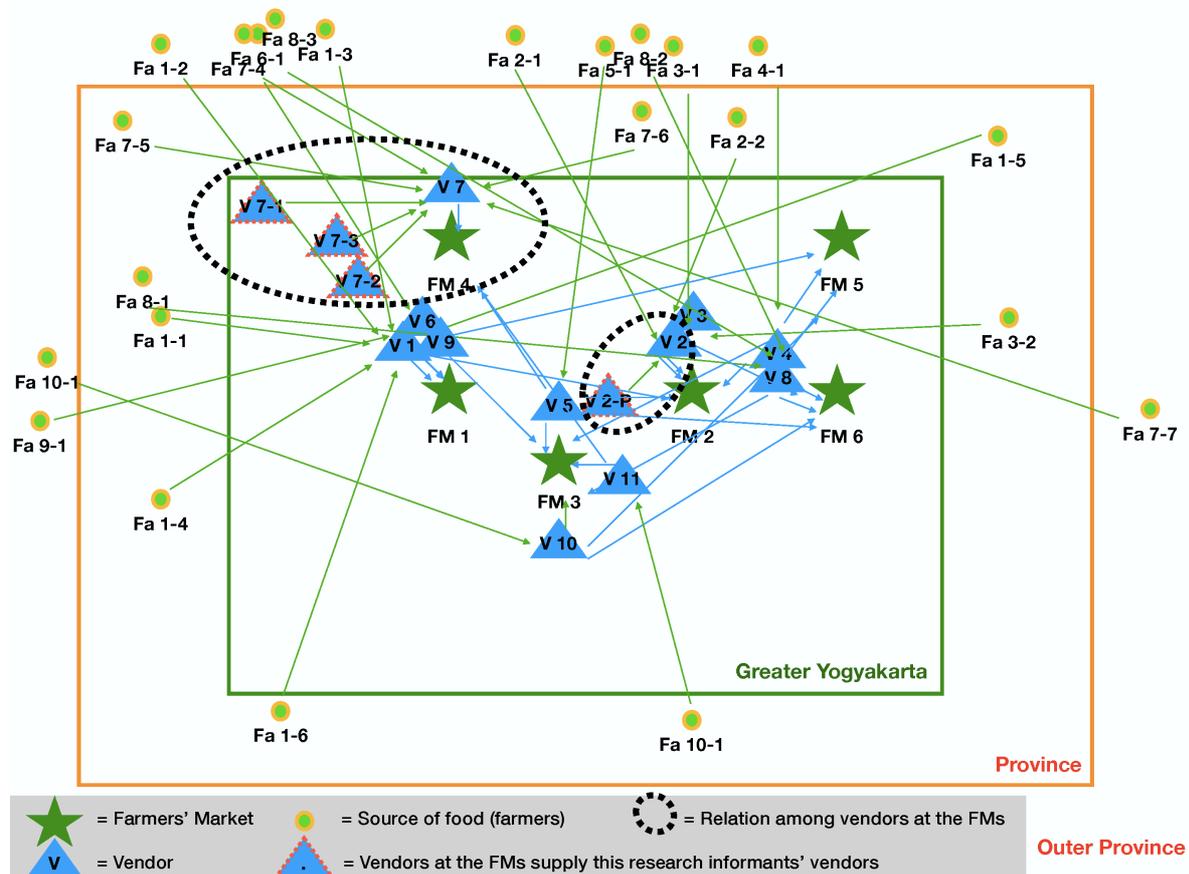


Figure 5. 1. FM food supply chains in GY FMs (own compilation).

Figure 5.1 shows where the interviewed vendors buy their raw materials, process them, and sell the finished products (i.e., the FMs). There are three geographic scale-based groups of raw material sources. The first is the *inter-supporting local groups* of vendors (V2, V7, and others) who sell at the FMs. The second is at the *within-province-scale* and includes ten locations as the origins of raw materials. The last is from *outside the province*; most of the raw materials originate in this outer area. The network of relationships is also depicted: For example,  $V7 \rightarrow FM4$  indicates that V7 (vendor number 7) sells in FM4 (farmers' market 4) and V7-1 (another vendor in FM4) supplies raw material to V7. The farmers who supply products to the vendors are also shown. For example, Fa7-5 (a farmer/producer) who lives in the province and Fa7-4 from outside the province both supply raw materials to V7.

#### **5.4.4. Non-local food perceived as local through the concept of health**

At the FMs, non-local food is transformed into local food through the concept of health. A concept critical to understanding the idea of localness at the FMs is the previously discussed concept of proximity and its components. As Figure 5.1 shows, most of the vendors collect raw materials from outside GY. This raises the question of why they use raw materials that are not locally sourced (i.e., in geographical proximity). According to the informants, there are three main reasons for using these products: (1) They sell a variety of products, and sometimes specific ingredients or materials are needed; (2) Some materials are not available in GY, or even in the province; and (3) Even if the materials can be found within GY or the province, out-of-season high prices sometimes make the vendors reluctant to buy them. Therefore, the vendors often try to look for appropriate raw materials, regardless of the distance from GY to maintain their products' high quality.

Even in this expanded context of local, healthy food is not necessarily synonymous with local food. How, then, do the vendors try to embody these two concepts: local and healthy in the food products they provide? According to the vendors and managers, there are two types of attitudes toward practices related to healthy and local food. The first type can be thought of as a trade-off model, whereby the vendors must decide where to place their priority – healthy or local. In general, the overall sentiment for this trade-off was expressed by one vendor, who said: “Providing excellent products for customers is our main priority” (V5). As a result, some of the food sold at the market may be from the GY area, some from outside the GY area, and some may even be imported from other countries. The second type of attitude attempts to satisfy both ideas, at least conceptually under the notion that local food is healthy food. To provide what they perceive as excellent food, the vendors look for high-quality materials from a variety of places, ranging from farmers, friends, and traditional markets, both within and outside the province. How do they treat this geographically non-local food as being local and therefore healthy food? The idea of localness is essential to conveying the quality of healthiness in food sold at these FMs, but most vendors prefer healthy products over local ones, so they must extend the meaning of local and widen its geographic scale. Previously, Gupta and Makov (2017) examined “the degree of localness” by observing where a material comes from as an approach to explain what is local/non local food from the physical and economical viewpoint (p. 620). Further discussion is still needed to determine how to approach the local concept from a proximity perspective (O'Neill, 2014).

O'Neill (2014) also discussed the places where products are marketed and attempted to conceptualize localness by first identifying the meaning of local food through a scale approach. In my interviews, an informant (V7) who is an artisan said that he collaborates with another organization involved in tourism and craft programs. They attempted to conserve and add value to a food product from outside Java. He said that during their collaboration they conducted a survey and identified a commodity – a fruit grown in one particular area – that may have become extinct. They hoped that they could increase the value – both of the product and for the community – by introducing this fruit widely and educating others about its sustainable use. The goal was to first sell the product in the local community before sharing the product more widely. This story is an example of how one artisan attempted to develop his brand by ‘importing’ a raw material that originated outside Yogyakarta but was then processed in Yogyakarta and became a local product.

As noted earlier, the practices of the vendors/managers regarding the concept of the ‘local’ can be explained by using Eriksen’s notion of relational proximity (Eriksen, 2013). In particular, relational proximity at Yogyakarta FMs can be seen from the vendors’/managers’ practical ways of looking for the materials from their friends or trusted suppliers. For example, one informant said: “The raw materials I got from my friends, so I guarantee the process” (V7).

#### **5.4.5. Vendor/manager motives**

As a whole, vendors have two reasons for participating in the FMs: economic and social. Two quotes are presented as examples of economic motives. In the first, a vendor notes that selling their healthy products is the reason for participating in the market: “My considerations are for running this business. Before I started this business, in Jogja, if we looked for a place to sell healthy food, the options were limited” (V2). In the second quote, however, a vendor said that if the primary reason for providing healthy food at the market were to gain profit, the vendor would not participate: “As an example of the joys and sorrows of the business, say with regard to money, I would have given up from the beginning. It is difficult for marketing (to make a profit). I face frequent losses” (V1).

Most of the informants share such strong non-economic motives. They often expressed their pleasure at providing alternative spaces where customers could obtain healthy, high-quality food. An example of this point of view was expressed as follows:

We do not work here for . . . economic reasons. I think my friends are committed to their ideas. Most of them point out that commerce is the second or third priority; the first priority is to create excellent products. (V5)

One vendor's reason for providing fresh and healthy food was in line with the expected reasons noted by the notion of "good food" (Connell et al., 2008, p. 181). Based on the FMs customers perception in British Columbia, Canada, Connell et al. (2008) stated that "organic is good, family scale farming is good, local is good, natural is good, and shopping at farmers' markets is good" (p. 181). In particular, this vendor was concerned with providing fresh products: "I don't intend to compete with other FMs . . . However, it [my participation] would extend or enlarge a place where people could obtain fresh and local products" (V3).

Other motives were also cited; for example, "helping others" (V1) was noted as a reason to participate. These social ties between producers and consumers probably reflect a mixture of economic and non-economic motives.. Social ties can be thought of as being embedded in the economic relationships of the FMs activities (Block, 1990).

#### **5.4.6. Formal and informal mechanisms to ensure local and healthy food at the FMs**

In general, there are two types of mechanisms in any social system: formal and informal (Bloom & Hinrichs, 2011). A formal mechanism might include the use of certificates or other 'official' sanctions, whereas informal mechanisms are more relationship driven. A formal mechanism in the FM context might be the use of a third-party certificate as proof of quality products. This can be seen at the distribution of agricultural products from the farmers to the FMs after processed by the vendors. One vendor, when discussing farmers who supply raw materials, said: "Yes, previously we have been willing to cooperate with farmers because they have shown us their certificates" (V6). In practice, however, few, if any, vendors/managers at Yogyakarta's FMs rely on certificates from third-party institutions. Instead, they have initiated the use of informal mechanisms that are expected to provide assurance of the quality of the products sold at the FMs. Darby and Karni (1973) coined the term "credence" for the relationship developed between vendors and customers and said that "credence qualities are those which, although worthwhile, cannot be evaluated in normal use" (pp. 68-69).

Most of the informants described informal mechanisms to ensure the quality of their products. For example, one of the FMs pays particular attention to the vendors' homemade products as a primary requirement when joining that market:

So, for the new members or vendors, I say 'Do you make the products yourself or not?' That way, when the consumers want to buy a product, they can ask many questions, and the vendors could answer those questions. This communication leads to trust between the producers and the consumers. (V3)

Another informal mechanism is the use of quality control (V9) or curator (V7) teams that are informally organized in some FMs. A team or committee is made of vendors who are selected by the FM community. A primary task is to ensure that the products sold in the FM are of high quality and healthy. This team also plays an important role when the FM acquires a new vendor, and it usually examines the quality of the products of prospective vendors before they can join the market. New vendors have to personally assure the quality of their products; this is another informal mechanism stipulated by the particular FMs. However, this mechanism also sometimes enforces efforts to build trust, particularly with new vendors. One vendor (V1), for example, mentioned that he is happy to explain the quality of his products, regardless of whether she/he makes a sale. Another explained that it takes time, and a process, to sell products. Trust-building occurs in face-to-face interactions between vendors and buyers at the FMs (Penker, 2006). One informant (V3) said that after trust has been established between the vendor and the consumer, the consumer also begins to trust the quality of the products. Nevertheless, one informant points out that gaps in knowledge can always occur between a vendor and new consumers. Some mechanisms that are practiced to address trust are exemplified in this informant's statement:

There are precise requirements: the origins of the products should be clear; and the origin means the geographical region's name, the identity of the producers, and the process of how crops are converted into products. Usually for vendors joining a healthy market community, if their products are rice and vegetables, typically the products are requested to be organic, healthy, natural, and environmentally friendly. (V1)

Trust is an essential component of the market, and the market participants have worked hard to build trust. This quote illustrates the experiences of one vendor:

In the group, we have had this process for a long time, maybe almost nine years. So, positive interaction with generous intention can be seen . . . We have proved that our process gives benefit to the community so they will provide support . . . trust is developed from a remarkable friendship. (V11)

When I asked a manager to describe any challenges related to community interactions he first explained the importance of the relationship between vendors and customers and emphasized trust as a critical element:

We need to develop confidence and to trust each other. That is our aim . . . because if there is distrust between the vendors and consumers, the vendors will lose out . . . they the vendors do indeed need consumers. (M1)

In the FMs or alternative market mechanisms, the actors especially the vendors and managers have commitment following their ability to provide the best food. In other words, the best food is equal to the quality of the products (Mastronardi, Romagnoli, Mazzocchi, Giaccio, & Marino, 2019). Compared to other types of market (traditional or modern market) in Indonesian context, consumers visit the traditional market for the reason that it offers cheaper price for the same products than the modern market (Rahadi, 2012). However, the middle class people prefer to buy their needs in the modern market (Sugiana, 2008). Returning to the focus of trust at FMs, if producers can provide best food or “good food” (Joosse & Hracs, 2015), these are curated in their own team or other ensured mechanism at each FM and then communicated with the consumers. The trust between consumers and producers at the FMs will be formed following a “dyadic process” or like an agreement between a trustor and a trustee (Trivette, 2017, p. 529). At one of Yogyakarta FMs, a trustee is appointed by the manager who act as a curator. At another FM, a manager has a responsibility as a trustee. Another FM has its own style that all of the vendors act as a trustee for the products sold at the FMs, particularly when a new vendor who has a presentation for introducing his/her products is permitted to join as a member of that particular FMs or not. Regarding the term of credence, I borrow from Chamhuri and Batt Peter’s (2015, p. 1172) paper concerning on halal as “credence cue”. The notion of halal is also considered by the vendors at Yogyakarta’s FMs (V1).

Hinrichs et al. (2004) argued that FMs are an example of “an embedded or embedding institution” through their role in supporting “material and social resources” (p. 36). Moreover, FMs are “social institutions mediating economic activity” (Hinrichs et al., 2004, p. 37). Clear evidence exists of the markets’ material role: “These activities are their, the vendors’, occupation and also their business development” (M1). The previously discussed informal mechanisms and relations among vendors, managers, and consumers, highlight the social relations that shaped trust and improved economic opportunity. The informants stressed the importance of friendship and trust and how they contributed to the shaping of the FMs. This was particularly true when the FMs were first being established, and the close relationships that existed between friends helped to assure product quality. One vendor described the role of friendship as follows:

I started with my closest friends because I knew what kinds (of products they made), the quality of their products, and the extent of their story regarding of their products, so most of them, suppliers and vendors, are my closest friends.  
(V3)

## 5.5. CONCLUSIONS

Previous research showed that there is limited research about alternative food practices in developing countries (Chiffolleau, 2009). This chapter has discussed GY FMs as an example of this rather new practice in Indonesia which co-exists with traditional and modern markets. First, this chapter has identified the importance of local and healthy attributes of the products offered by the vendors and managers at the GY FMs. However, the understanding of local is not limited to geographic proximity, but rather can be understood from a variety of interpretations of what can be considered to be proximate. Second, findings highlighted the social relationships between sellers and consumers and the GY FMs' mission to inform and educate the latter. Social embeddedness within vendors and FM structures based on trust also plays an important role in order to gain entry into GYs FMs.

This chapter contributes to agrifood market studies, specifically elucidating why and how FMs co-exist with other market types in urban metropolitan areas of developing countries. Although the role of small community markets as discussed in this chapter in supplying food and produce for city dwellers may be minor in quantitative terms, these markets are becoming more common as an alternative food space to provide localness and healthy food as a means to provide quality products to customers who are interested in a healthy lifestyle. Vendors and microentrepreneurs at these markets thus meet needs that are not being met in more conventional outlets, including traditional markets and modern supermarkets.

This chapter further shows how vendors and managers at GY FMs are operating based on informal market mechanisms which mostly depend on trust as a foundation of social capital. This mechanism is closely related to the vendors' motivation and their social and economic entrepreneurship. The vendors and managers at the GY's FMs have both economic and social motives. The vendors are businesspeople trying to both sell products and scale-up their businesses, but the prices at the FMs are fixed, and the participants themselves report that the economic component is not their primary reason for joining the market. Essential social components of the markets are friendship and trust, which shape social embeddedness. Although geographical proximity is an important part of the markets' local nature, relational proximity creates the social ties that bind the relationships among the actors.

Despite providing important insights on alternative food practices in developing countries, this chapter has limitations. First, the discussion mainly focuses on FMs, whereas other market types which co-exist with these FMs are not analysed. It would be useful to compare the social and economic mechanisms of the different market types within GY.

Secondly, this chapter employed a rather small sample since it pursued an explorative qualitative research approach. Third, this chapter focused on the vendors and managers' perspectives and thus neglected the demand and consumer perspective. Fourth, this chapter discussed FMs within one single metropolitan area, GY. A comparison to other Indonesian cities would be useful. Further research is needed to determine whether these Yogyakarta FMs can be said to be part of a larger community-based food movement and whether similar phenomena can be seen in other places in Indonesia. In particular, more detailed examinations of the mechanisms underlying the FMs, as well as the inclusion of consumers' perspectives, are needed. Overall, it is essential to examine comprehensively why and how the different actors become involved in FMs in developing countries and how their small businesses can succeed. Finally, the use of a more comprehensive qualitative method, such as grounded theory, to build or develop theory, and the integration of quantitative methods to determine economic impacts should also be attempted in future studies.

# CHAPTER 6

## **CHAPTER 6. CONCLUSIONS**

This chapter consists of two sections. First, it addresses the main research question of this dissertation and nine research questions based on the four empirical studies of Chapters 2, 3, 4, and 5. Second, it provides limitations and possible agendas for future researches.

### **6.1. ADDRESSING RESEARCH QUESTIONS**

The main research question of this dissertation is whether local food represents a remained tradition that will soon be replaced by national or global food, or an alternative to the conventional in Indonesia as a emergently developing country. To answer this question, this dissertation focuses on the geographical pattern of local food potentials and the discursive meanings at local food practices.

In this chapter, I identify the seven main findings based on examining the conclusions of the previous four chapters. These seven meanings show slippery meanings of local food or a variety of definition of local food (Kingsbury, Maeda, & Takahashi, 2010; N. Phillips & Hardy, 2002). I employ the semiotic analysis to discuss the meaning of local food from studying local food activities at the regional and local levels (Feldman, 1995). I choose the semiotic cluster analysis, the method borrowed by Feldman from Manning, to provide the "meaning to specific acts" of local food activities in Yogyakarta Special Province (Feldman, 1995, p. 39).

First, it can be said that in Yogyakarta Special Province by addressing two research questions (1), and (2) as proposed in Chapter 2 the spatially concentrating pattern potentials of local food is identified. In Chapter 2, agro-ecologies represent a biophysical aspect or what is called natural elements of the region. From this explanation, I discuss the meaning of local food as the natural. However, the findings indicate that local food is potentially concentrated in a particular area that does not necessarily correspond to the natural resources represented by the agro-ecologies. There is an indication that local food crops are not grown in a suitable area for local food cultivation. It is also supported by the farmers behaviour on where they want to plant the local food crops.

Second, a concept as proposed in the earlier Chapter 3 is a local food centre (Subejo et al., 2017). The research has also shown that even though local food cultivation seems more suitable in the upland area but this area faced a problem of poverty and food insecurity. Chapter 3 is started from an inquiry to identify local food production linking deprivation poverty and food insecurity condition in particular rural villages. Local food is related to the rural problem

(rural deprivation). From this finding, it is correct if the government of Kulon Progo Regency design a key policy priorities on local food production or local food center in the upland area.

Third, the Chapter 4 addresses critical issues found in women farmers group experiences. Feldman's semiotic clustering analysis is useful to analyse meaning by clustering particular issues (Feldman, 1995). I identify seven themes of what I grouped local food practices, namely materiality, functionality, local food systems, government initiative, identity, structure, and space. In short, I identify the meaning of local food from healthy concern. For the women, they define the meaning of local food as healthy food, and the local culture stresses the role of women to take care of their family members. Nevertheless, while men center on main agricultural activities, including rice cultivation, in the gender relations, women are engaged in local food production as a secondary business. Then, the analysis cannot be separated from another finding of Chapter 4 in the fourth section.

Fourth, I identify the relationship between local food practice and gender activities. I point out three meanings from the findings in Chapter 4, namely local food as a secondary job, local food as residual, and local food as women's domain. Discussing local food as a secondary job, it shows that women activity on managing local food as a secondary job because men center on main agricultural activities including rice cultivation as an evidence shown in previous literature cited in Chapter 4. Some women choose to produce some petty commodities processed from local food materials such as chips as their secondary business. Not all of the KWT sell their local food products to another part because of some issues or obstacles. Interviewees also mentioned that their activity on local food as a side job to support their family livelihoods.

Fifth, another issue is identified from the women farmer group activity, namely local food as residual. The term residual is significant in studying agricultural business in a remote rural area (CEC, 1988 cited in Figueiredo, 2008). A previous research also mentions that urban agriculture is an example of residual practice because of the location where the plants are grown (Tornaghi, 2014). Another study also explains the land use in rural area under the residual term (Van Wagner, 2016). In the setting of this dissertation, there is some practice informed by some interviewees, for example, that local food crops are planted in marginal areas, in the embankment of the paddy field, polybag. The reason for conducting this residual practice because there is a belief that local food is less prospectus rather than planting paddy.

Sixth, in Chapter 5 turning to the market sector at farmers markets practice, local food is defined from the healthy perspective. There are practices for the actor to give a label to non-

local food as local, or what is called as localness (C. Gupta & Makov, 2017; O'Neill, 2014). This practice is conducted to present healthy products no matter from a distance.

Seventh, to answer the research question (8) for the vendors at the farmers' markets, it seems that the meaning of local food also as a vehicle (DeLind, 2002, 2011; Delind & Bingen\*, 2008). For example, DeLind (2011) points out local food as a vehicle due to its economic potential. Not only financial advantage is received by the vendors, but also another advantage such as social advantage when they interact at the FMs. For this advantage, it is clear that instrumentalism and marketness are practised in the FMs (Block, 1990). To explain the meaning of local food as a vehicle at Yogyakarta FMs, I remember the stories of two market managers or leaders. A manager express his belief that some vendors have a dream to scale up their business. He illustrates one success story from a former vendor who now can open her shop selling local food products. Another vendor who also acts as one leader at one FM illustrates that there is no mechanism to erase the vendors from the membership list. In my understanding, it means that on the one hand, their FMs always need supports from their members. On the other hand, when the vendors regularly come to sell their products, they could regularly interact with their consumers and other vendors and/or managers. The relation between producers and consumers shows social interaction or embedded at the FMs (Granovetter, 1985). To the best of my knowledge, it is evident that FMs activity shows its role as a vehicle to develop their community in line with another type of civic agriculture activity called CSA (Delind & Bingen\*, 2008; Pole & Gray, 2013).

Returning to the semiotic clustering of the meaning of local food identified from the findings and then grouped into two primary purposes of this dissertation. For the first objective, the meaning of local food: (1) local food is not natural, and (2) needing for commodity centres. While, for the second objective the meaning of local food: (3) local food as healthy concern, (4) local food as a secondary job providing an important livelihood, (5) local food as residual, (6) local is related to women or the notion of "mother", (7) labelling non-local food as local (localness), and (8) local food as a vehicle.

One remain task is to answer the central question of this dissertation: does local food represent a remained tradition that will soon be replaced by national or global food or an alternative to the conventional? To address this question, on the one hand, in Chapter 1, Indonesia has experience of food transition (Simatupang, 2016). On the other hand, it is clear that the reason why local food is chosen is because of less trust on conventional food system (see BildtgÅrd, 2008; see Meijboom, Visak, & Brom, 2006; Trivette, 2017). It is clear from the

finding of Chapter 2, even though local food primarily practices in the upland area are based on its natural potential (based on the biophysical aspect) as I give a notion of local food as natural many are for self-supporting. Still, there is a more active practice of cultivating local food, not in a suitable area for local food plantation, meaning the reality: local food is not natural. It gives advantages that local food still exists from the production practice. Besides, as noted from the findings from Chapter 3, local food is always a useful resource to solve poverty and food insecurity problem. Therefore, the government of Kulon Progo Regency to maintain local food as one strategy to address poverty and food insecurity is an appropriate policy. From the women activity at their group, as shown in Chapter 4, the existence of local food practice is evident. Their practice to manage local food is expected at least to maintain local food production and consume local food on small scale practice for their motive to provide healthy food for their families. Women practice at the community (KWT) reflects an example of the importance of the role of “mother” as noted by Sachs et al. (2016). In Chapter 5, it is clear that there is a practice of local food in small scale market activities. There is a consideration to collect non-local food as a local food because not all of the raw materials are originated from Yogyakarta metropolitan area or Greater Yogyakarta and also from within the province. This practice is motivated for producing healthy food.

In short, to address the central question on the continuity of local food, it is necessary to revisit some literature, for instance: (1) Indonesia food transition experience (Simatupang, 2016), (2) “triple burden theory” (Moerdijati Gardjito, 2017), and (3) situating the alternative and conventional food system (O'Neill, 2014). One strategy proposed by Simatupang (2016) is strengthening local food competitive advantage through maintaining local food culture. Besides, Gardjito (2017) argues that one of the three critical issues of local food development in Indonesia is local food policy. If the government of Indonesia could create an excellent infrastructure and atmosphere to support local food activities, it is believed that local food has a good prospect in the future. From the international experiences, I borrow from the previous research in the UK on differentiating the notions of “local”, “conventional, and “alternative”. There is an argument that rural development is essential for local food (O'Neill, 2014). Therefore, even though local food is seen as "residual" but it has a specific role in local development, particularly to solve poverty and/or food insecurity problem (Delind, 2011; Van Wagner, 2016). Finally, to the best of my knowledge, it seems that local food in Indonesia is entering a period of the cultural (re)turn to the local even in increasingly globalising food transition, and also the discussion of the conventional and the alternative food discussion (Corsi

et al., 2018; Simatupang, 2016).

## **6.2. LIMITATION AND FUTURE RESEARCH**

In the previous chapters in this dissertation, I have provided some limitations of this study and proposed some recommendation for future researches. Firstly, regarding the local food policies, my descriptions in Chapter 1 only briefly review the selected food policy documents. It is needed to discuss more detail meanings of the food policies related to local food, for example, interviewing with the government officers to gain in-depth information on the present situations (for example see Owen, 2014b). Secondly, in Chapter 2, even though I have presented the findings of local food potentials connecting the agroecological and the economic and physical conditions, nevertheless, my study still lacks detail explanations on the social and environmental perspectives (Olson, 2019). Besides, Chapter 2 is inspired by Benedek and Balázs (2016), and has attempted to fill in the gap by examining a biophysical aspect combined with an application of local food index. However, this chapter remains a task for investigating the local food system where the research was conducted. Third, in Chapter 3, I have paid little attention to the prospected situations of local food production. Fourth, certainly, the women farmers' groups have significant roles in managing local food. However, I could not understand the current situations, some of which some groups face as urgent issues, through the quantitative lens using statistical methods. Fifth, my study on farmers' markets in the city in Chapter 5 is also from a qualitative perspective. Further, this study focuses on vendors and managers as key food actors, lacking consumers' point of views as one of the most significant actors in the downstream of the food systems. From the value perspective, this chapter mainly focuses on the notion of health, as a representation of value proximity. In contrast, according to the previous study of value at farmers markets using four indicators, namely health, fairness, care, and ecology (IFOAM Principle cited in Klimek, Bingen, & Freyer, 2018). Therefore, a future research is needed on exploring the other three components of value such as fairness, care, and ecology.

I consider the notion of local food explained by some scholars as foundational concern for future researches on local food (for example see Olson, 2019; R. Phillips & Wharton, 2016a; Robinson & Farmer, 2017). For Phillips and Wharton who pay attention to the relations among local food systems, livelihood, and community development, the local food policy is essential to create sustainability of the local food systems (R. Phillips & Wharton, 2016a). They also propose five approaches to achieve sustainable local food systems (R. Phillips & Wharton,

2016a). First, sustainable local food systems need to be supported by people's awareness of local food. This awareness is then critical for maintaining the local culture said as local wisdom commonly in Indonesia. Secondly, a local resource is an essential capital in developing local food systems. Attention on the importance of local resources is also considered in the official definition of the local in Indonesia (see Indonesia Law of Food no 18/ 2012). Third, it is also important how the local community manage local food, mainly to fulfil its own needs. Fourth, the local food should provide social and economic benefits to local people from what they have processed. Fifth, local food actors need the facilitation of preparing their abilities in a local food business. In Indonesia (Pusat Pengantaragan Konsumsi dan Keamanan Pangan, 2018), there are two programs called *Pengembangan Industri Pangan Lokal* (Local Food Industrial Development) and *Pengembangan Pangan Pokok Lokal* (Staple Local Food Development). These programs concerning small and medium enterprises to develop local food (non-rice and non-flours) that are in line with the fifth approach from Phillips and Wharton.

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# APPENDICES

# **APPENDIX 1**

## APPENDIX 1. SELECTED DATA FOR ANALYSIS LOCAL FOOD POLICY IN INDONESIA

No	Abbreviation	Province	Document	Source
1	Aceh	Aceh	Draft Rancangan Qanun Pangan Aceh (Draft of Aceh food regulation)	<a href="https://dinaspangan.acehprov.go.id/wp-content/uploads/2019/12/Draft-Rancangan-Qanun-Pangan-Aceh-Final-Revisi.pdf">https://dinaspangan.acehprov.go.id/wp-content/uploads/2019/12/Draft-Rancangan-Qanun-Pangan-Aceh-Final-Revisi.pdf</a>
2	Sumut	Sumatera Utara (North Sumatra)	-	-
3	Sumbar	Sumatera Barat (West Sumatra)	Peraturan Daerah Provinsi Sumatera Barat Nomor 3 Tahun 2015 tentang Kemandirian Pangan (Sumatera Barat regulation number 3/ 2015 about food sovereignty)	<a href="http://jdih.birohukum.sumbarprov.go.id/detail/peraturan/4/peraturan-daerah-provinsi-sumatera-barat-nomor-3-tahun-2015.html">http://jdih.birohukum.sumbarprov.go.id/detail/peraturan/4/peraturan-daerah-provinsi-sumatera-barat-nomor-3-tahun-2015.html</a>
			Peraturan Gubernur Sumatera Barat Nomor 08 Tahun 2017 tentang Penganekaragaman Pangan Berbasis Sumber Daya Lokal (Governor of Sumatera Barat regulation number 08/ 2017 about food diversification based on local resources)	<a href="https://dinaspangan.sumbarprov.go.id/details/news/470">https://dinaspangan.sumbarprov.go.id/details/news/470</a>
4	Riau	Riau	Peraturan Daerah Provinsi Riau Nomor 13 Tahun 2018 tentang Ketahanan Pangan (Riau regulation number 13/ 2018 about food security)	<a href="https://diskepang.riau.go.id/home/download/PERDA_NOMOR_13_TAHUN_2018_Ketahanan_Pangan.pdf">https://diskepang.riau.go.id/home/download/PERDA_NOMOR_13_TAHUN_2018_Ketahanan_Pangan.pdf</a>
5	Kepri	Kepulauan Riau (Riau Islands)	-	

No	Abbreviation	Province	Document	Source
6	Jambi	Jambi (Jambi)	Peraturan Daerah Provinsi Jambi Nomor 5 Tahun 2012 tentang Ketahanan Pangan (Jambi regulation number 5/ 2012 about food security)	<a href="http://www.dprd-jambiprov.go.id/dl/2-%20Perda%20Nomor%205%20tahun%202012%20Tentang%20Ketahanan%20Pangan.pdf">http://www.dprd-jambiprov.go.id/dl/2-%20Perda%20Nomor%205%20tahun%202012%20Tentang%20Ketahanan%20Pangan.pdf</a>
			Peraturan Gubernur Jambi Nomor 14 Tahun 2010 tentang Percepatan Penganekaragaman Konsumsi Pangan berbasis Sumber Daya Lokal di Provinsi Jambi (Governor of Jambi regulation number 14/ 2010 about acceleration of local food diversification on consuming local food based local resources in Jambi Province)	<a href="http://jdih.tanjabbarkab.go.id/adm1n/file/8063PergubNo.14Tahun2010.pdf">http://jdih.tanjabbarkab.go.id/adm1n/file/8063PergubNo.14Tahun2010.pdf</a>
7	Bengkulu	Bengkulu (Bengkulu)	-	
8	Sumsel	Sumatera Selatan (South Sumatra)	-	
9	Babel	Kepulauan Bangka Belitung (Bangka Belitung Islands)	Peraturan Gubernur Kepulauan Bangka Belitung Nomor 30 Tahun 2018 tentang Gerakan Masyarakat Gemar Makan Sayur, Buah, Umbi-umbian, Kacangan dan Ayam Merawang (Governor of Bangka Belitung Islands number 30/ 2018 about societies movement to consume vegetables, fruits, tubers, beans, and Merawang chicken)	<a href="http://jdih.babelprov.go.id/sites/default/files/produk-hukum/PERGUB%20NO.%2030%20TAHUN%202018_0.pdf">http://jdih.babelprov.go.id/sites/default/files/produk-hukum/PERGUB%20NO.%2030%20TAHUN%202018_0.pdf</a>
			Peraturan Gubernur Kepulauan Bangka Belitung Nomor 25 Tahun 2010	<a href="http://jdih.babelprov.go.id/content/gerakan-percepatan-penganekaragaman-konsumsi-pangan-berbasis-sumber-daya-lokal">http://jdih.babelprov.go.id/content/gerakan-percepatan-penganekaragaman-konsumsi-pangan-berbasis-sumber-daya-lokal</a>

No	Abbreviation	Province	Document	Source
			tentang Gerakan Percepatan Penganekaragaman Konsumsi Pangan Berbasis Sumber Daya Lokal (Governor of Bangka Belitung Islands regulation number 25/2010 about the movement of acceleration of local food diversification on consuming local food based local resources	
10	Lampung	Lampung (Lampung)	-	
11	Banten	Banten (Banten)	Peraturan Gubernur Banten Nomor 9 Tahun 2010 tentang Percepatan Penganekaragaman Konsumsi Pangan Berbasis Sumber Daya Lokal (Governor of Banten regulation number 9/ 2010 about acceleration of local food diversification on consuming local food based local resources	<a href="https://jdih.bantenprov.go.id/hukum/58Pergub%20No.%209%20Thn%202010.pdf">https://jdih.bantenprov.go.id/hukum/58Pergub%20No.%209%20Thn%202010.pdf</a>
			Peraturan Daerah Provinsi Banten Nomor 2 Tahun 2017 tentang Penyelenggaraan Pangan (Banten regulation number 2/ 2017 about food management)	<a href="https://jdih.bantenprov.go.id/hukum/2017 Perda 02.pdf">https://jdih.bantenprov.go.id/hukum/2017 Perda 02.pdf</a>
12	DKI	Daerah Khusus Ibukota Jakarta (Special Capital Region of	Pergub No.9.BD.2019/NO.75002 Peraturan Gubernur Tentang Penyediaan Makanan Tambahan Anak Sekolah pada Satuan Pendidikan (Governor of Jakarta regulation number No.9.BD.2019/NO.75002 about providing additional food for	<a href="https://jdih.jakarta.go.id/uploads/default/produk hukum/REVINSI_B ARU PERGUB NO. 9 TAHUN 2019 TENTANG PMTAS.pdf">https://jdih.jakarta.go.id/uploads/default/produk hukum/REVINSI_B ARU PERGUB NO. 9 TAHUN 2019 TENTANG PMTAS.pdf</a>

No	Abbreviation	Province	Document	Source
		Jakarta)	school children)	
13	Jabar	Jawa Barat (West Java)	Peraturan Gubernur Jawa Barat Nomor 60 Tahun 2010 Tentang Percepatan Penganekaragaman Konsumsi Pangan Berbasis Sumberdaya Lokal (Governor of West Java regulation number 60/2010 about acceleration of local food diversification on consuming local food based local resources)	<a href="http://jdih.jabarprov.go.id/page/info/produk/6426">http://jdih.jabarprov.go.id/page/info/produk/6426</a>
14	Jateng	Jawa Tengah (Central Java)	Peraturan Gubernur Jawa Tengah Nomor 36 Tahun 2017 Tentang Pengembangan Pangan Lokal di Provinsi Jawa Tengah (Governor of Central Java regulation number 36/2017 about local food development in Central Java Province)	<a href="https://jdih.jatengprov.go.id/downloads/produk_hukum/pegub/pegub_tahun_2017/pegub_36_th_2017.pdf">https://jdih.jatengprov.go.id/downloads/produk_hukum/pegub/pegub_tahun_2017/pegub_36_th_2017.pdf</a>
15	DIY	Daerah Istimewa Yogyakarta (Yogyakarta)	Peraturan Gubernur Daerah Istimewa Yogyakarta Nomor 88 Tahun 2012 tentang Petunjuk Pelaksanaan Gerakan Percepatan Penganekaragaman Konsumsi Pangan Berbasis Sumber Daya Lokal (Governor of Yogyakarta regulation number 88/2012 about a guidance of the movement of acceleration of local food diversification on consuming local food based local resources)	<a href="http://jdih.jogjaprov.go.id/storage/1472022214pegub88-2012.pdf">http://jdih.jogjaprov.go.id/storage/1472022214pegub88-2012.pdf</a>
16	Jatim	Jawa Timur (East Java)	Peraturan Gubernur Jawa Timur Nomor 71 tahun 2009 tentang Petunjuk Pelaksanaan Gerakan Percepatan Penganekaragaman Konsumsi Pangan	<a href="http://arsipjdih.jatimprov.go.id/upload/1992/PERGUB_71_2009.pdf">http://arsipjdih.jatimprov.go.id/upload/1992/PERGUB_71_2009.pdf</a>

No	Abbreviation	Province	Document	Source
			Berbasis Sumber Daya Lokal Provinsi Jawa Timur (Governor of East Java regulation number 71/ 2009 about a guidance the movement of acceleration of local food diversification on consuming local food based local resources)	
17	Bali	Bali (Bali)	Peraturan Daerah Provinsi Bali Nomor 10 Tahun 2017 tentang Pengelolaan Sapi Bali (Bali regulation number 10/ 2017 about managing Bali beef)	<a href="https://jdih.baliprov.go.id/produk-hukum/peraturan/abstrak/24492">https://jdih.baliprov.go.id/produk-hukum/peraturan/abstrak/24492</a>
			Peraturan Daerah Provinsi Bali Nomor 3 tahun 2013 tentang Perlindungan Buah Lokal (Bali regulation number 3/ 2013 about local fruits protection)	<a href="http://ditjenpp.kemenkumham.go.id/files/ld/2013/ProvinsiBali-2013-3.pdf">http://ditjenpp.kemenkumham.go.id/files/ld/2013/ProvinsiBali-2013-3.pdf</a>
			Peraturan Gubernur Bali Nomor 99 Tahun 2018 tentang Pemasaran dan Pemanfaatan Produk Pertanian, Perikanan dan Industri Lokal Bali (Governor of Bali regulation number 99/ 2018 about marketing and utilisation of local Balinese agriculture, fisheries, and industry)	<a href="https://jdih.baliprov.go.id/uploads/produk-hukum/peraturan/2018/PERGUB/PERGUB_NOMOR_99_TAHUN_2018.pdf">https://jdih.baliprov.go.id/uploads/produk-hukum/peraturan/2018/PERGUB/PERGUB_NOMOR_99_TAHUN_2018.pdf</a>
18	NTB	Nusa Tenggara Barat (West Nusa Tenggara)	Peraturan Gubernur Nusa Tenggara Barat Nomor 5 Tahun 2017 tentang Gerakan Percepatan Penganekaragaman Konsumsi Pangan Berbasis Sumber Daya Lokal di Provinsi Nusa Tenggara Barat (Governor of West Nusa Tenggara number 5/ 2017 about the movement of	<a href="https://jdih.ntbprov.go.id/sites/default/files/produk_hukum/BD%20Pergub%20Nomor%205%20Tahun%202017.pdf">https://jdih.ntbprov.go.id/sites/default/files/produk_hukum/BD%20Pergub%20Nomor%205%20Tahun%202017.pdf</a>

No	Abbreviation	Province	Document	Source
			acceleration of local food diversification on consuming local food based local resources in West Nusa Tenggara Province)	
19	NTT)	Nusa Tenggara Timur (East Nusa Tenggara)	-	
20	Kalbar	Kalimantan Barat (West Kalimantan)	Peraturan Daerah Provinsi Kalimantan Barat Nomor 5 Tahun 2018 tentang Pengelolaan Pangan (West Kalimantan regulation number 5/ 2018 about food management)	<a href="https://jdih.kalbarprov.go.id/sites/default/files/peraturan/2018/apr/pengelolaan-pangan.pdf">https://jdih.kalbarprov.go.id/sites/default/files/peraturan/2018/apr/pengelolaan-pangan.pdf</a>
21	Kalteng	Kalimantan Tengah (Central Kalimantan )	-	
22	Kalsel	Kalimantan Selatan (South Kalimantan)	-	
23	Kaltim	Kalimantan Timur (East Kalimantan)	-	
24	Kaltara	Kalimantan Utara (North Kalimantan)	Peraturan Gubernur Kalimantan Utara Nomor 52 tahun 2018 tentang Pengembangan Pangan Lokal di Provinsi Kalimantan Utara (Governor of North Kalimantan regulation number 52/ 2018 about local food development in North Kalimantan Province)	<a href="https://peraturan.bpk.go.id/Home/Details/101924/pergub-prov-kalimantan-utara-no-52-tahun-2018">https://peraturan.bpk.go.id/Home/Details/101924/pergub-prov-kalimantan-utara-no-52-tahun-2018</a>

No	Abbreviation	Province	Document	Source
25	Sulsel	Sulawesi Selatan (South Sulawesi)	-	
26	Sultra	Sulawesi Tenggara (Southeast Sulawesi)	-	
27	Sulbar	Sulawesi Barat (West Sulawesi)	Peraturan Gubernur Sulawesi Barat Nomor 01.a Tahun 2011 tentang Gerakan Percepatan Penganekaragaman Konsumsi Pangan Berbasis Sumber Daya Lokal (Governor of West Sulawesi number 01.a./ 2011 about the movement of acceleration of local food diversification on consuming local food based local resources)	<a href="https://jdih.sulbarprov.go.id/?page=peraturan&amp;act=search">https://jdih.sulbarprov.go.id/?page=peraturan&amp;act=search</a>
28	Sulteng	Sulawesi Tengah (Central Sulawesi)	Peraturan Gubernur Sulawesi Tengah Nomor 15 Tahun 2010 tentang Gerakan Percepatan Penganekaragaman Konsumsi Pangan Berbasis Sumber Daya Lokal (Governor of Central Sulawesi regulation number 15/ 2010 about the movement of acceleration of local food diversification on consuming local food based local resources)	<a href="https://jdih.sultengprov.go.id/peraturan/(%20NOMOR%2015%20TAHUN%202010%20)%20GERAKAN%20PERCEPATAN%20PENGANEKARAGAMAN%20KONSUMSI%20PANGAN%20BERBASIS%20SUMBER%20DAYA%20LOKAL.pdf">https://jdih.sultengprov.go.id/peraturan/(%20NOMOR%2015%20TAHUN%202010%20)%20GERAKAN%20PERCEPATAN%20PENGANEKARAGAMAN%20KONSUMSI%20PANGAN%20BERBASIS%20SUMBER%20DAYA%20LOKAL.pdf</a>
29	Gorontalo	Gorontalo (Gorontalo)	Peraturan Daerah Provinsi Gorontalo Nomor 3 Tahun 2015 tentang Pembelajaran Ilmu Gizi Berbasis Makanan Khas Daerah Gorontalo	<a href="https://peraturan.bpk.go.id/Home/Details/67786/perda-prov-gorontalo-no-3-tahun-2015">https://peraturan.bpk.go.id/Home/Details/67786/perda-prov-gorontalo-no-3-tahun-2015</a>

No	Abbreviation	Province	Document	Source
			(Gorontalo regulation number 3/ 2015 about nutrition studies based on traditional food)	
30	Sulut	Sulawesi Utara (North Sulawesi)	-	
31	Malut	Maluku Utara (North Maluku)	-	
32	Maluku	Maluku (Maluku)	Peraturan Daerah Provinsi Maluku Nomor 10 Tahun 2011 tentang Pengelolaan dan Pelestarian Sagu (Maluku regulation number 10/ 2011 about sago management and conservation)	<a href="https://peraturan.bpk.go.id/Home/Details/32404">https://peraturan.bpk.go.id/Home/Details/32404</a>
			Peraturan Daerah Provinsi Maluku Nomor 5 tahun 2014 tentang Pelestarian, Pengelolaan, dan Pengembangan Pangan Lokal Daerah Maluku (Maluku regulation number 5/ 2014 about local food protection, management, and development in Maluku)	<a href="http://jdih.malukuprov.go.id/peraturan/lihat/7137debd45ae4d0ab9aa953017286b20">http://jdih.malukuprov.go.id/peraturan/lihat/7137debd45ae4d0ab9aa953017286b20</a>
33	Pabar	Papua Barat (West Papua)	-	
34	Papua	Papua (Papua)	-	

# **APPENDIX 2**

## APPENDIX 2. LIVELIHOOD

### APPENDIX 2.1. DETAIL EXPLANATION OF LIVELIHOOD FOR TABLE 3.1. (CHAPTER 3)

No	Indicators of Livelihood Assets	Weight	Score
1	Physical Capital		
1.1.	Number of Primary School	3	0 = 0 1 = Low Rank 2 = Medium Rank 3 = High Rank
1.2.	Number of Junior High School	3	0 = 0 1 = Low Rank 2 = Medium Rank 3 = High Rank
1.3.	Number of Senior High School	3	0 = 0 1 = Low Rank 2 = Medium Rank 3 = High Rank
1.4.	Number of Polindes (Village-Health Pos: a self-managed health facility by the community which has aim on mother and children health)	3	0 = 0 1 = Low Rank 2 = Medium Rank 3 = High Rank
1.5.	Number of Posyandu (Integrated Health Pos: a local health service for the neighbourhood and supported by health officers)	3	0 = 0 1 = Low Rank 2 = Medium Rank 3 = High Rank
1.6.	Number of Puskesmas (Community Health Center: a health centre that has provided by the government, usually serve at a sub-district level)	3	0 = 0 1 = Low Rank 2 = Medium Rank 3 = High Rank
1.7.	Number of Pharmacy	3	0 = 0 1 = Low Rank 2 = Medium Rank 3 = High Rank
1.8.	Availability of Public Transportation	3	0= No 3= Yes
1.9.	Village Road Can be Traversed for the Whole Year	3	0= No 3= Yes
1.10.	Availability of Cellular Signal	3	0= No 3= Yes
1.11.	Availability of Internet Café	1	3= No 0= Yes
1.12.	Market Existence	3	0= No 3= Yes
1.13.	Availability of Shopping Centre	1	3= No 0= Yes
1.14.	Availability of Gas as Cooking Fuel	3	0= No 3= Yes
2	Social Capital		
2.1.	The existence of Social Conflict	3	3= No 0= Yes

No	Indicators of Livelihood Assets	Weight	Score
2.2.	Number of Street Children Gathering	1	3= No 0= Yes
3	Natural Capital		
3.1.	Ever Experiencing Natural Disasters: Landslide	3	3= No 0= Yes
3.2.	Ever Experiencing Natural Disasters: Flood	3	3= No 0= Yes
3.3.	Ever Experiencing Natural Disasters: Flash Flood	3	3= No 0= Yes
3.4.	Ever Experiencing Natural Disasters: Forest Fire	3	3= No 0= Yes
3.5.	Ever Experiencing Natural Disasters: Drought	3	3= No 0= Yes
3.6.	Availability Safe Drinking Water Source	3	0= No 3= Yes
3.7.	Ever Experiencing Pollution: Water	3	3= No 0= Yes
3.8.	Ever Experiencing Pollution: Soil	3	3= No 0= Yes
3.9.	Ever Experiencing Pollution: Air	3	3= No 0= Yes
4	Human Capital		
4.1.	Migrant Workers Recruitment Agency	1	3= No 0= Yes
4.2.	Number of Disabled People	3	0 = 0 1 = High Rank 2 = Medium Rank 3 = Low Rank
4.3.	Agriculture as Main Working Sector	3	3 = Agriculture 0 = Others
5	Financial Capital		
5.1.	Availability of Banking Office	3	0= No 3= Yes
5.2.	Availability of Cooperative	3	0= No 3= Yes
5.3.	Availability of Credit Facilities	3	0= No 3= Yes

Notes:

According to [www.livelihoodstoolbox.org](http://www.livelihoodstoolbox.org), weight should be given according to its degree of importance, a score from 1 to reflect the low significance of the asset(s) up to 3 that reflects the most important. Meanwhile, score shows its access and ownership and has a variation for its score: 0 = low to 3 = high. However, in this paper, I conduct two modifications. Firstly, due to its weighted value is given by implementing my subjective value and theoretical considerations rather than based on rank that is provided by local government or local people from their Focus Group Discussion. Secondly, I modify the score value because the livelihood data are grouped into two types: binary and numerical. For the binary data type, I give merely score 0 for No and 3 for Yes, except for some indicators that logically reflect good or bad

condition or impact. For example, I stand for the disaster indicators are given 0 for Yes and 3 for No. Meanwhile, for the numerical data, I operate a calculation of the same interval technique. This technique measures the maximum value subtracted from the minimum value and then divided into 3 class. I give score 1 for data that including in low-rank interval, 2 for the average rank interval, and 3 for the high-rank range. A guideline from previous research paper mention that ratings are assigned based on its previous literature review explanations and author judgements (Hapsari & Rudiarto, 2017). An exception for a zero value for a particular variable, although it is grouped into the low-class interval, I decided to give 0 for this zero valued indicator.

## APPENDIX 2.2. LOCAL FOOD PLANTED AREA POTENTIAL

Village	Geographical Zone	Type	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Jangkaran	Lowland	L-L	L	M	M	L	L	L	M	L	M	L
Sindutan	Lowland	L-L	L	L	M	L	M	L	L	L	L	L
Palihan	Lowland	L-L	L	L	M	L	L	L	L	L	L	L
Glagah	Lowland	L-L	L	M	N/A	L	L	L	M	L	L	L
Kalidengen	Lowland	L-L	L	L	M	L	L	L	L	L	L	L
Plumbon	Lowland	L-L	L	L	M	L	L	L	L	L	L	L
Kedundang	Lowland	L-L	L	L	M	L	L	L	L	L	L	L
Demen	Lowland	L-L	L	L	M	L	L	L	L	L	L	L
Kulur	Lowland	L-L	L	M	M	L	M	L	L	L	L	L
Kaligintung	Lowland	L-L	L	M	M	L	M	L	L	L	L	L
Temon Wetan	Lowland	L-L	L	L	N/A	L	M	L	L	L	L	L
Temon Kulon	Lowland	L-L	L	L	M	L	M	L	L	L	L	M
Kebonrejo	Lowland	L-L	L	L	M	L	L	L	L	L	L	L
Janten	Lowland	L-L	L	L	M	L	L	L	L	L	L	L
Karang Wuluh	Lowland	L-L	L	L	M	L	L	L	L	L	L	L
Karangwuni	Lowland	M-L	L	L	M	M	L	L	L	L	M	L
Sogan	Lowland	L-L	L	L	L	M	L	L	L	L	M	L
Kulwaru	Lowland	L-L	L	M	M	M	L	M	L	M	L	L
Ngestiharjo	Lowland	M-L	L	L	M	M	M	L	L	M	M	L
Triharjo	Lowland	M-L	L	L	M	M	M	L	L	L	M	L
Bendungan	Lowland	H-M	L	L	M	M	M	M	L	M	M	L
Giripeni	Lowland	M-H	L	M	M	L	M	L	L	M	M	L
Wates	Lowland	M-H	L	L	L	L	L	L	L	L	M	L
Garongan	Lowland	L-L	L	H	L	L	L	L	H	L	M	L
Pleret	Lowland	L-L	L	H	L	L	L	L	M	L	M	L
Bugel	Lowland	L-L	L	H	L	L	L	L	M	L	M	L
Kanoman	Lowland	L-L	L	L	H	L	L	L	L	L	M	L
Depok	Lowland	L-L	L	L	L	L	L	L	L	M	M	L
Bojong	Lowland	L-L	L	M	M	L	L	L	L	M	M	M
Tayuban	Lowland	M-L	L	M	M	L	M	L	L	M	M	L
Gotakan	Lowland	H-L	L	L	M	L	M	L	L	L	M	M
Panjatan	Lowland	L-L	L	L	L	L	M	L	L	M	M	M
Cerme	Lowland	L-L	L	L	L	L	L	L	H	M	M	L
Krembangan	Lowland	L-L	L	L	L	L	L	L	L	L	M	L
Karangsewu	Lowland	L-L	L	M	M	M	M	L	M	M	M	L
Banaran	Lowland	M-L	L	M	M	M	M	L	M	M	M	M
Kranggan	Lowland	L-L	L	M	M	L	M	L	L	M	M	L
Nomporejo	Lowland	M-L	L	M	M	L	M	L	L	M	M	M
Brosot	Lowland	M-L	L	L	M	L	L	L	L	L	M	M
Pandowan	Lowland	L-L	L	M	M	L	M	L	L	M	M	L
Tirtorahayu	Lowland	M-L	L	L	M	M	M	L	M	M	M	L
Wahyuharjo	Lowland	L-L	N/A									
Bumirejo	Lowland	L-L	L	L	M	L	L	L	L	M	L	M
Jatirejo	Lowland	L-L	L	L	M	M	M	M	L	M	M	M
Sidorejo	Lowland	H-L	H	M	M	H	H	H	H	H	H	H
Gulurejo	Lowland	M-L	L	L	M	H	M	M	L	H	H	M
Ngentakrejo	Lowland	H-L	L	L	L	M	L	L	L	L	L	L
Demangrejo	Transitional	L-L	N/A									
Srikayangan	Transitional	M-L	L	L	L	L	L	L	L	L	L	L
Tuksono	Transitional	M-H	L	L	L	L	L	L	L	L	L	L
Salamrejo	Transitional	L-L	L	L	L	L	L	L	L	L	L	L
Sukoreno	Transitional	L-L	N/A									
Kaliagung	Transitional	M-L	L	L	L	L	L	L	L	L	L	L
Sentolo	Transitional	H-L	N/A									
Banguncipto	Transitional	M-L	L	L	L	L	L	L	L	L	L	L
Tawangsari	Transitional	L-L	N/A									
Karangsari	Transitional	H-L	L	L	L	L	L	L	L	L	L	L
Kedungsari	Transitional	M-L	L	L	L	L	L	L	L	L	L	L
Margosari	Transitional	M-L	L	L	L	L	L	L	L	L	L	L

Pengasih	Transitional	H-M	N/A									
Sendangsari	Transitional	L-L	L	L	L	L	L	L	L	L	L	L
Sidomulyo	Transitional	M-L	L	L	L	L	L	L	L	L	L	L
Hargomulyo	Transitional	M-L	H	L	M	M	M	M	L	M	M	M
Hargorejo	Transitional	L-L	H	L	M	M	M	M	L	M	M	H
Hargowilis	Transitional	M-H	H	L	M	M	M	L	L	M	L	M
Kalirejo	Transitional	M-M	M	L	M	L	M	L	L	M	L	M
Hargotirto	Transitional	M-H	M	L	M	L	M	L	L	M	L	M
Jatimulyo	Transitional	H-L	M	L	M	L	L	L	L	M	N/A	M
Giripurwo	Transitional	H-H	L	L	L	L	L	L	L	L	L	L
Pendoworejo	Upland	M-L	M	M	M	M	M	L	L	L	N/A	M
Purwosari	Upland	M-L	M	H	M	L	N/A	N/A	L	M	N/A	M
Banyuroto	Upland	M-L	L	L	L	L	L	L	L	L	L	L
Donomulyo	Upland	H-L	L	L	L	L	L	L	L	L	L	L
Wijimulyo	Upland	L-L	L	L	L	L	L	L	L	L	L	L
Tanjungharjo	Upland	M-L	L	L	L	L	L	L	L	L	L	L
Jatisarono	Upland	L-L	N/A									
Kembang	Upland	L-L	L	L	L	L	L	L	L	L	L	L
Banjararum	Upland	M-L	L	L	L	L	L	L	L	L	L	L
Banjarasri	Upland	L-L	L	L	L	L	L	L	L	L	L	L
Banjarharjo	Upland	H-L	L	L	L	L	L	L	L	L	L	L
Banjaroya	Upland	M-L	L	L	L	L	L	L	L	L	L	L
Kebonharjo	Upland	H-L	M	L	N/A							
Banjarsari	Upland	M-L	M	M	H	M	M	M	L	M	M	H
Purwoharjo	Upland	H-H	M	L	M	M	M	L	L	L	M	M
Sidoharjo	Upland	L-H	N/A									
Gerbosari	Upland	M-L	L	M	M	M	M	M	M	M	M	H
Ngargosari	Upland	M-H	L	M	L	L	L	L	L	L	L	L
Pagerharjo	Upland	L-M	L	M	M	M	M	M	M	M	M	H

Note:

1. Sign of the colour show the class difference among local food production, darker color shows higher class. Meanwhile, N/A = No Data, L = Low, M = Medium, H = High

2. The name of local food crops: (1) cassava/*ubi kayu*; (2) sweet potato/*ubi jalar*; (3) edible canna/*ganyong*; (4) arrowroot/*garut*; (5) prasina/*gadung*; (6) birch rim yam/*gembili*; (7) pumpkin/*labu kuning*; (8) tuber/*uwi*; (9) bread fruit/*sukun*; (10) elephant's foot/*suweg*.

## APPENDIX 2.3. LOCAL FOOD PRODUCTION POTENTIAL

Village	Geographical Zone	Type	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Jangkaran	Lowland	L-L	L	L	M	L	L	L	H	L	M	L
Sindutan	Lowland	L-L	L	L	L	L	L	L	M	L	L	L
Palihan	Lowland	L-L	L	L	L	L	L	L	L	L	L	L
Glagah	Lowland	L-L	N/A	L	N/A	L	L	L	L	L	L	L
Kalidengen	Lowland	L-L	L	L	L	L	L	L	M	L	L	L
Plumbon	Lowland	L-L	L	L	L	L	L	L	M	L	L	L
Kedundang	Lowland	L-L	L	L	L	L	L	L	L	L	L	L
Demren	Lowland	L-L	L	L	L	L	L	L	M	L	L	L
Kulur	Lowland	L-L	L	L	L	L	M	L	L	L	L	L
Kaligintung	Lowland	L-L	L	L	L	L	L	L	M	L	L	L
Temon Wetan	Lowland	L-L	L	L	N/A	L	L	L	L	L	L	L
Temon Kulon	Lowland	L-L	L	L	L	L	L	L	L	L	L	L
Kebonrejo	Lowland	L-L	L	L	L	L	L	L	L	L	L	L
Janten	Lowland	L-L	L	L	L	L	L	L	M	L	L	L
Karang Wuluh	Lowland	L-L	L	L	L	L	L	L	M	L	L	L
Karangwuni	Lowland	M-L	L	L	L	L	L	L	L	L	M	L
Sogan	Lowland	L-L	L	L	L	M	L	L	L	L	L	L
Kulwaru	Lowland	L-L	L	M	L	M	L	L	L	M	L	L
Ngestiharjo	Lowland	M-L	L	L	M	L	L	L	L	M	M	L
Triharjo	Lowland	M-L	L	L	M	M	L	L	L	L	M	L
Bendungan	Lowland	H-M	L	L	L	L	L	L	L	L	M	L
Giripeni	Lowland	M-H	L	M	M	L	L	L	L	M	L	L
Wates	Lowland	M-H	L	L	L	M	L	L	L	L	M	L
Garongan	Lowland	L-L	L	L	L	L	L	L	M	L	L	L
Pleret	Lowland	L-L	L	L	L	L	L	L	L	L	L	L
Bugel	Lowland	L-L	L	L	L	L	L	L	L	L	L	L
Kanoman	Lowland	L-L	L	L	L	L	L	L	L	L	L	L
Depok	Lowland	L-L	L	L	L	L	L	L	L	L	L	L
Bojong	Lowland	L-L	L	L	L	L	L	L	L	L	L	L
Tayuban	Lowland	M-L	L	L	L	L	L	L	L	L	L	L
Gotakan	Lowland	H-L	L	L	L	L	L	L	L	L	L	L
Panjatan	Lowland	L-L	L	L	L	L	L	L	L	L	L	L
Cerme	Lowland	L-L	L	L	L	L	L	L	L	L	L	L
Krembangan	Lowland	L-L	L	L	L	L	L	L	L	L	L	L
Karangsewu	Lowland	L-L	L	M	M	L	L	L	M	M	M	L
Banaran	Lowland	M-L	L	M	M	L	L	L	M	L	M	L
Kranggan	Lowland	L-L	L	M	M	L	L	L	L	L	M	M
Nomporejo	Lowland	M-L	L	M	M	L	M	L	M	L	M	L
Brosot	Lowland	M-L	L	L	M	L	L	L	L	L	M	L
Pandowan	Lowland	L-L	L	M	L	L	L	L	L	L	L	L
Tirtorahayu	Lowland	M-L	L	L	M	L	M	L	M	M	M	L
Wahyuharjo	Lowland	L-L	N/A									
Bumirejo	Lowland	L-L	L	L	L	L	L	L	L	M	L	M
Jatirejo	Lowland	L-L	L	L	M	M	L	L	N/A	L	L	L
Sidorejo	Lowland	H-L	H	L	L	H	M	H	H	H	M	M
Gulurejo	Lowland	M-L	M	L	L	H	M	H	L	H	H	L
Ngentakrejo	Lowland	H-L	L	L	L	L	L	L	L	L	L	L
Demangrejo	Transitional	L-L	N/A									
Srikayangan	Transitional	M-L	L	L	L	L	L	L	L	L	L	L
Tuksono	Transitional	M-H	L	L	L	L	L	L	L	L	L	L
Salamrejo	Transitional	L-L	L	L	L	L	L	L	L	L	L	L
Sukoreno	Transitional	L-L	N/A									
Kaliagung	Transitional	M-L	L	L	L	L	L	L	L	L	L	L
Sentolo	Transitional	H-L	N/A									
Banguncipto	Transitional	M-L	L	L	L	L	L	L	L	L	L	L
Tawangsari	Transitional	L-L	N/A									
Karangsari	Transitional	H-L	L	L	L	L	L	L	L	L	L	L
Kedungsari	Transitional	M-L	L	L	L	L	L	L	L	L	L	L
Margosari	Transitional	M-L	L	L	L	L	L	L	L	L	L	L
Pengasih	Transitional	H-M	N/A									
Sendangsari	Transitional	L-L	L	L	L	L	L	L	L	L	L	L
Sidomulyo	Transitional	M-L	L	L	L	L	L	L	L	L	L	L
Hargomulyo	Transitional	M-L	H	L	M	M	M	L	L	M	L	L
Hargorejo	Transitional	L-L	L	L	M	M	M	L	L	M	L	L
Hargowilis	Transitional	M-H	H	L	M	L	M	L	L	M	L	L
Kalirejo	Transitional	M-M	M	L	M	L	L	L	L	M	L	L

Hargotirto	Transitional	M-H	M	L	M	L	L	L	L	L	L	L
Jatimulyo	Transitional	H-L	L	L	M	L	L	L	L	M	M	L
Giripurwo	Transitional	H-H	L	N/A	L	L	L	L	L	L	L	L
Pendoworejo	Upland	M-L	L	H	H	M	H	M	L	M	M	L
Purwosari	Upland	M-L	M	M	H	L	H	M	L	H	M	M
Banyuroto	Upland	M-L	L	L	L	L	L	L	L	L	L	L
Donomulyo	Upland	H-L	L	L	L	L	L	L	L	L	L	L
Wijimulyo	Upland	L-L	L	L	L	L	L	L	L	L	L	L
Tanjungharjo	Upland	M-L	L	L	L	L	L	L	L	L	L	L
Jatisarono	Upland	L-L	N/A									
Kembang	Upland	L-L	L	L	L	L	L	L	L	L	L	L
Banjararum	Upland	M-L	L	L	L	L	L	L	L	L	L	L
Banjarasri	Upland	L-L	L	L	L	L	L	L	L	L	L	L
Banjarharjo	Upland	H-L	L	L	L	L	L	L	L	L	L	L
Banjaroya	Upland	M-L	L	L	L	L	L	L	L	L	L	L
Kebonharjo	Upland	H-L	L	N/A								
Banjarsari	Upland	M-L	L	L	L	N/A	N/A	N/A	L	N/A	N/A	N/A
Purwoharjo	Upland	H-H	L	L	L	L	L	L	L	N/A	L	N/A
Sidoharjo	Upland	L-H	L	L	M	M	M	L	M	L	M	L
Gerbosari	Upland	M-L	L	L	M	L	M	L	M	M	L	L
Ngargosari	Upland	M-H	L	L	N/A							
Pagerharjo	Upland	L-M	L	L	L	L	L	L	L	L	H	H

Note:

1. Sign of the colour show the class difference among local food production, darker color shows higher class. Meanwhile, N/A = No Data, L = Low, M = Medium, H = High

2. The name of local food crops: (1) cassava/*ubi kayu*; (2) sweet potato/*ubi jalar*; (3) edible canna/*ganyong*; (4) arrowroot/*garut*; (5) prasina/*gadung*; (6) birch rim yam/*gembili*; (7) pumpkin/*labu kuning*; (8) tuber/*uwi*; (9) bread fruit/ *sukun*; (10) elephant's foot/*suweg*