

*Research Article*

## **Biodiversity and food culture in a matriarchal system in West Sumatra**

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### **Abstract**

Meals are a human creation that unconsciously represent the way in which we live, depending on which part of the world we are living and it has as its basis our cultural background. Recently, the issue about food is not only how to prepare it, but as well as how to get nutritious food supporting human health from limited natural resources. From this view point, choosing food gives an insight not only on the nutrition itself but about cultural and environmental factors as well. The objective of this study is to investigate if biodiversity still plays an important role in supporting local food security and sustaining food culture in a matriarchal system. The study was done in Minangkabau; a coastal area, hilly area and lake area of West Sumatra, Indonesia. Participatory rural appraisal (PRA) was used to investigate biodiversity and food culture. Qualitative and quantitative research techniques included: in-depth interview and survey. The data was coded and clustered by using MAXQDA10. The results indicate that the matriarchal system is still playing an important role in food culture in Minangkabau. The mother plays important roles in kitchen activity, meal decision and land ownership, although she is not involved directly in farming. The mother also plays an important role to enhance the food culture in the household by using local food diversity or by cultivating spices in the backyard. Thus the matriarchal system sustains the food culture still plays an important role in managing the farm to fork activities.

**Keywords:** participatory rural appraisal, Minangkabau, sustainable natural resources, ethnography, gender, Indonesia.

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## **Introduction**

Local food security is closely related to accessibility and availability including diversity of food which is a part of local biodiversity [1]. Preservation of biodiversity needs the awareness and responsibility of people on their ecological environment while choosing, preparing, consuming and enjoying [2]. Indigenous food cultures are usually rich in biodiversity, creating a demand for bio-diverse agricultural products. Therefore, if the demand for these food cultures can be sustained, the agricultural biodiversity in a region such as West Sumatra can also be preserved for generations to come, subsequently supporting local food security.

According to Altieri[3], traditional farming systems are based on biodiversity where genetic diversity is a key component to manage risk and lower reliance on agro-chemicals. One of the most important features of traditional farming systems is their high degree of biodiversity [3], which will also contribute to preventing the erosion of genetic resources [3, 4]. Moreover, a farming system provides a lifestyle that binds a household together and subsequently leads to passing of family heritages to future generations through inheritance of the farm [5]. According to Brown and Hodgkin [6], one of the indicators in managing genetic diversity in situ is protection of traditional knowledge. The genetic diversity is important in providing adaptation to environmental changes and extremes and providing the natural variation for the future [6].

In Minangkabau culture, women are responsible to pass knowledge on to their clan and inheritants. There are not many adequate manuscripts or monographs giving information about when the matriarchal system in Minangkabau started. However, one of the reasons to keep the inheritance as the woman's role is to avoid the conflict between the brothers who hereditarily may have different fathers. The Minangkabau are an excellent example that illustrates the practicality of managing biodiversity and natural resources and their food culture. In Minangkabau, as one of the biggest matriarchal clans, the mother plays a role from agricultural production up to preserving and processing of food. The interesting aspect of the Minangkabau culture is that they maintain their farmland in a unique way to prepare their food in comparison to other South East Asian culture. The Minangkabau's kinship system does not require women to leave their relatives when they marry; women inherit land and women play an active role in food production for all for their families [7].

After more than three decades of research, it is clear that men and women play different roles within the agricultural production and processing of food and occupy different socioeconomic positions as a result of these different roles. Since households and other social units have an impact on long term wellbeing related to their environments [8], the role and individual activity of family members become more important to be studied. Choosing policies for agriculture development requires the use of information about the existing role of matriarchal systems, gender and education in Minangkabau to give positive contribution in both traditional farming systems and food culture. Therefore, the objective of this study is to investigate if women still play an important role in the food chain and taking care of the regional biodiversity supporting local food security and sustained food culture in a matriarchal system in West Sumatra.

## Methods

In order to answer the research question both qualitative and quantitative methods are used. The primarily data collection method is Participatory Rural Appraisal (PRA) which is comprised of qualitative and quantitative data collection. PRA is an approach for holistic analysis for local conditions with participation of local stakeholders [9]

In qualitative data collection the method is ethnography (observation and in-depth interviews) with key persons and local people. The researcher stays in the villages together with local people. The observation covers all about the daily life activities from cultivation up to food culture. The observation is recorded to multimedia devices (small audio recorder). The audio recorder provides a much more detailed record of the verbal interaction than any amount of note taking or reflection could offer. According to Rapley[10], using a recorder is easy to replay and produce a transcript and then selectively draw on these to provide demonstration of emerging arguments [10]. The sampling technique in this investigation is the snowball sampling. It is very useful to find out whom people know and how they know each other, it is also useful in this study of small, bounded, or difficult to find population. The qualitative analysis is used MAXQDA version 2010 software (VERBI GmbH) for text analysis and voice analysis[11]. This software is developed by Philip University, Marburg, Germany.

In quantitative data collection, a statistical survey was conducted by using structured questionnaire for the households with a personal interview in home survey. The structured questionnaire covers nutritional intake, income and land status of ownership, crop production and demography. 50 respondents at each site (200 in total) voluntarily participated in this study. The research was done in West Sumatra, Indonesia, where Minangkabau live. The following places were chosen in four different topological locations for the investigation.

**Table 1. Topological sites of study.**

| Site | Location | Altitude (m) | Temperature (°C) | Rainfall (mm/year) |
|------|----------|--------------|------------------|--------------------|
| NU   | coastal  | 7-100        | 21-38            | 1400-4600          |
| NAB  | hilly    | 950          | 19-34            | 2570               |
| NPLM | lake     | 500          | 19-34            | 1400-4600          |
| NPS  | hilly    | 1094         | 19-34            | 4762               |

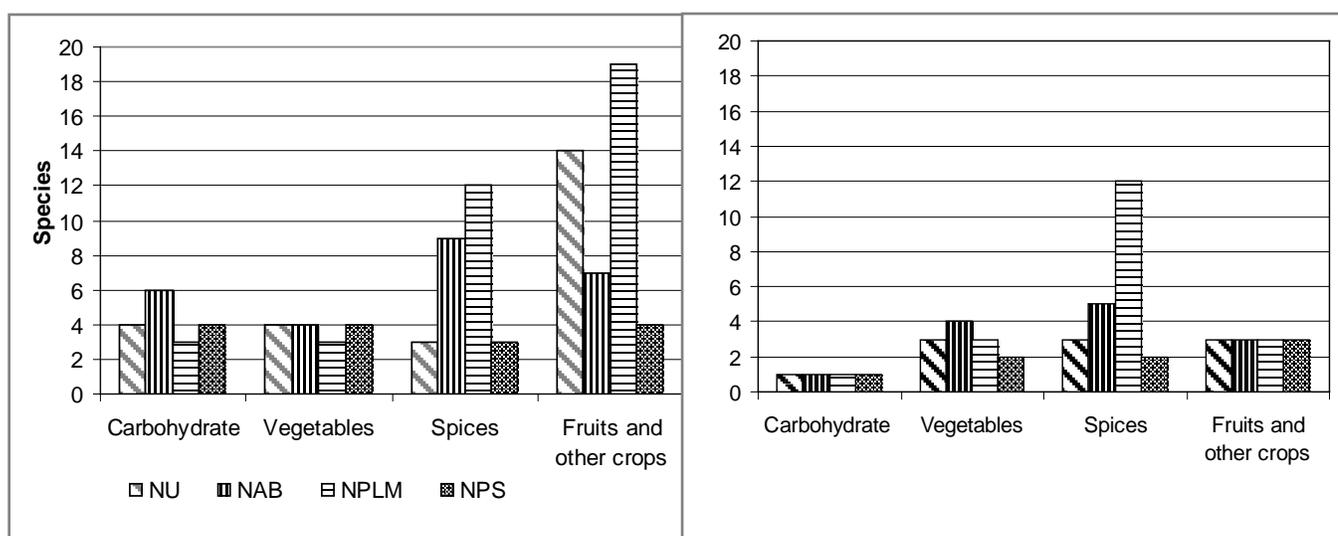
## Results

### *Biodiversity*

The intensive agriculture policy in Indonesia has forced the farmer within the last few decades to adopt non-traditional practices and these changes to traditional farming systems in the research areas might have had significant effect. However, the topographic (soils, altitude, rainfall and temperatures) is assumed not as a factor that reflects a change of high biodiversity related to food ingredients. The region NPLM has a higher biodiversity related to food ingredients compared to other sites (NU, NAB

and NPS) in West Sumatra even though this site is relatively similar in temperature (19 – 38°C) and rainfall (1400-4762 mm/year). The highest biodiversity is because of the awareness of local people in NPLM (Figure 1). People realized they are in an unfavorable climate and topographic condition. Therefore, they are more prepared for any possibilities of change e.g. climate change. Topographically the location experiences cloudy conditions daily, the winds come from the top of the hill, north east of the NPLM. Interestingly, there is not enough rainfall even though data shows an annual rainfall is reaching 4600mm/year, the rains largely fall behind the hill. People describe this phenomenon as “*shadow of the rain area*”. Despite this high annual rainfall, the particular valley where they live does not benefit because of the topographic diversity. Water flows into adjacent regions. However, there are also some advantages to this local micro-climate. The dry wind blowing from the top hill creates conditions in which pests and plant diseases cannot survive. This seasonal and predictable phenomenon provides a dependable and ecological plant protection strategy. They have more initiative to cultivate the spices in the backyard.

Furthermore, *rangkiang* and *kapuak* (traditional storages for rice) are no longer being used in this region. Farmers normally sell their paddies directly on the field after harvest even though not popular and banned by culture. Lately, the storage culture has become flexible because they need money to make the harvest secure. This way of selling instead of storing the crop started in the late 1970’s, rice became a cash crop, stimulating farmers to sell it, rather than save it.



(a) Biodiversity distribution (b) Biodiversity daily consumption by local people.

**Nutrient pattern**

An obvious fact is that carbohydrates are consumed only from rice at the four investigated regions in West Sumatra even though people do have different staple crops (Table 2). Most of the people said that if they do not eat rice they have not really eaten a proper meal. Fish has become the most prominent protein source in all sites, even though some of them live far from fresh water fish resources. NPLM, for example, has the lowest fish consumption even although this region is very close to a lake. But this fact does not reflect that people in NPLM do not like fish, but rather that they prefer

to eat fresh fish or that they know about pollution of the lake. Based on this investigation only two sites in West Sumatra are consuming fish, NU and NPLM. NAB and NPS only eat salted fish. Cassava leaf is the common vegetable for all investigated sites, which is very easy to grow and easy to prepare. NPLM has the highest availability of spices, out of 29 used spices in Minangkabau food, NPLM has 12, followed by NAB, NPS and NU. In most of the four sites people have 2-3 meals per day (Table 2) or two times a day with one peripheral meal in *Lapau* (coffee stall). Three daily meals are considered without peripheral diet.

### ***Preparation style***

In all sites, the mother typically cooks once a day and decides about the ingredients and food preparation of the daily meal. She prepares the spices, firewood and main meal. The activity starts normally from 9 to 11am. The meals; breakfast, lunch and dinner, are prepared at the same time. For dinner, only rice is prepared, while the main menu is only re-heated. Rice must be always warm; it is a symbol of protection, wellness, safety and delicacy. Fried food is preferred but sometimes boiled and sautéed meals are also enjoyed. The mother gets spices from a weekly market but some of the women still cultivate herbs and spices in their backyard which is important for biodiversity. Women still use a firewood stove giving a unique taste to their food. Firewood can be easily found from the surrounding area. When food is left over, it will be stored in a cabinet and often consumed the next day.

### ***Matriarchal system***

The mother plays an important role in deciding the daily meal (breakfast, lunch and dinner). The role includes land ownership, food storage, spices, teaching her daughter, education in general and almost all activities in the kitchen. The mother promotes nutritional consumption for her family but it is also related to family income.

Young women learn to cook from their mothers. It is traditional knowledge that is passed from generation to generation through experience. It's obvious that the transfer of knowledge in cooking is dependent on mother-daughter relations. Since most of the young girls have less time together with their mother due to the time requirement of school, only a few of them are now involved in the kitchen (Figure 2). As global changes support the formal education of more young females, finding time for the cultural transfer of these rich food traditions is becoming a challenge.

The husband does not interfere in cooking, nor decide what food will be cooked. These decisions are the absolute authority of the wife and will not be questioned by the husband.

Even though Minangkabau people are matriarchal, most farmers tend to be men, working on the land sometimes with help from women (Figure 3). Women hire men and women for the work on the field. In NAB, women get paid less than men for harvesting work which is because of the disproportionate number of women in the workforce. In NPLM, women have set up an initiative to cultivate the spices in their backyard thus saving money. Farming and fishing in NU is a job belonging to men, even though some women in NU are allowed to help or work on the land but not at sea. In NPS, women sometimes help the men to work on the land, but most of the time they are at home, doing non-agricultural activities. Therefore, even though women (matriarchal system) have still a big role in society and family; they have less activity on the farmland itself. This means that the transferring of the knowledge of traditional farming systems occurs through father-son or father-nephew interactions, whereas the knowledge about meals are in the hands of women.

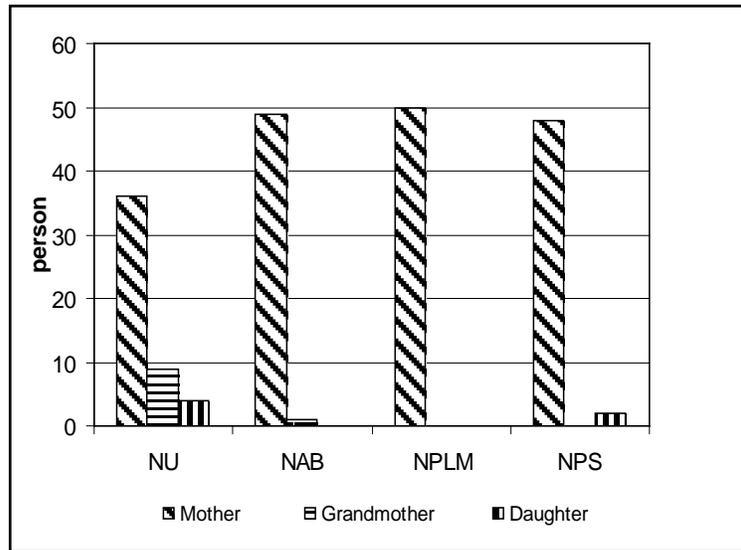


Figure 2. Mother, grandmother and daughter involved in food processing (n = 200).

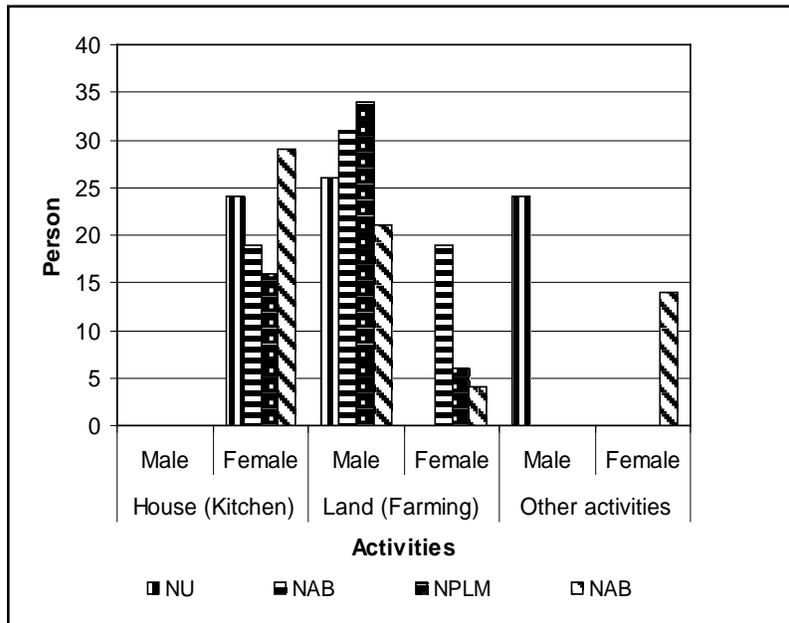


Figure 3. Gender and activities (n = 200).

**Table 2. Food Culture in Nagari Ulakan (NU), Nagari Aia Batumbuak (NAB), Nagari Padang Laweh Malalo (NPLM), Nagari Pandai Sikek (NPS) (n= 200).**

| Main Core                                 | NU   | NAB  | NPLM  | NPS  |
|---|--|--|---|--|
| Carbohydrate                              | Rice (100%)  | Rice (100%)  | Rice (100%)   | Rice (100%)                                  |
| Protein                                   | Fish (88%)<br>Egg (12%)                            | Fish (62%)<br>Egg (30%)<br>Chicken (8%)                              | Fish (32%)<br>Egg (12.7%)<br>Meat (30.7%)<br>Peanut (10.5%)<br>Tofu (7%)<br>Tempeh (3.5%) | Fish (88%)<br>Egg (10%)<br>Tofu/Tempeh (2%)  |
| Vegetables                                | Cassava leaf (64%)<br>Spinach (16%)<br>Other (24%) | Cassava leaf (26%)<br>Cabbage (16%)<br>Cucumber (2%)<br>Carrot (14%) | Cucumber (25.4%)<br>Cassava leaf (60.6%)<br>Jackfruits (14%)                              | Cassava leaf (10%)<br>Jackfruit (2%)         |
| Fruits                                    | Banana (40%)<br>Papayas (20%)<br>Oranges (44%)     | Banana (40%)<br>Papayas (20%)<br>Oranges (44%)                       | Banana (48%)<br>Papaya (45%)<br>Watermelon (7%)   | Banana (56%)<br>Papaya (20%)<br>Orange (10%) |
| Type of preparation                       | Frying, boiled, Sate                               | Frying, boiled, Sate   | Frying, boiled, cook  | Frying, boiled, Sate                         |
| Durable food intake per day<br>3 = normal | 100% eat 3   | 86% eat 3<br>14% eat 2   | 58% eat 3<br>42% eat 2  | 84% eat 3<br>16% eat 2                       |

## Results and Discussion

The results of the investigation show that processing techniques, ingredients and spices needed for food preparation are known only by the mother and that is why this can be called a food culture family secret. The techniques: slicing, mixing, sautéing, grinding and portioning, this all influences the final taste of a meal. The mother has the role teaching their daughter how to cook and it is a source of shame in the Minangkabau culture if a girl cannot cook well. The challenge of today is the decreasing time for interactions between mother and daughter (observation, teaching). There is an unwritten cultural expression that a woman is not *fully* a woman when she cannot cook well. Therefore, from the time that girls become teenagers, they are helping their mothers to prepare and cook for daily food. This role has been respectfully accepted by men. Men are still not involved in cooking and preparing food. Men trust what women prepare and cook. Women try to make to a good meal even though they are often under economic pressure. Men are not used to cooking when they are married, and in some parts of Indonesia, it is shameful for men to cook. Men cook only on special occasions, festivals, or if he has a job in a restaurant. In some cultures in Indonesia to cook would even threaten a man's masculinity [12]. In Minangkabau culture cooking is a gender specific activity even though this boundary between men and women's roles has become very unclear in the last decade. The mother plays an important role as land owner and head of the kitchen. Men are not *allowed* to cook; it is still shameful when men perform the work of women. The other reason that the kitchen is a place associated with women (mother) is that in preparing their family food, a woman is still expressing her sense of protector, as apart from the mothering role.

There is no discrimination between men and women in the job, but it is culturally recognized that, in all sites in West Sumatra, farming is men's work. Men tend to work on the land even though women

have the role of owning the land. Looking at additional income besides farming, in NU fishing is a man's job. In NPS weaving is only a woman's job. This activity is very helpful for gaining extra income. Fishing is still recognized as a man's job, only *menenun*(weaving)and kitchen activity is recognized as a woman's activity. Both men and women have the same opportunity to get an education. Many men get further higher education because women tend to get married earlier. The traditional farming system changes because not many of the young generation are choosing agriculture as their job.

In NU, NPLM and NPS most the young boys have gone to *marantau* (traditional migration); if they are single, they are free to migrate. If wage work is not available in the immediate area, the household labour allocation strategy may necessitate one or more members becoming involved in circular migration [13]. Increased income is the goal of these young boys, but it is a different situation with young women. Most of them have gone to *marantau* because of arranged marriages even though in the last few years arranged marriages have decreased slightly. Most of the people in *rantau* (migration destination) are not even concerned about their land ownership in their village. They simply trust their relatives to take care of it, but often this will result in conflicts. The heads of clans are responsible for making sure the land is divided based on the customary law. This law requires that the female gains the biggest part. Men get a smaller portion of this inheritance and leads to fewer resources to feed their families therefore motivate them to go *marantau* and/or change the farming system.

Local government policy is inseparable with national policies which have been regulated since 1968. The emphasis in this regulation is largely focused on food production and supply, with little attention to food distribution purchasing power for accesses to food [14]. In all investigated sites, the intensive agricultural program does not guarantee that farmers will get more income. At the same time, increased yields produce a surplus which automatically lowers selling prices.

Men and women have equal opportunities for getting a formal education. With the exception that women have fewer chances to continue onto higher education, mostly because of arranged marriages. Even if a woman continues to maintain control of her own land, lower levels of education would make her less likely to benefit from non-agricultural income. Improvements in female schooling observed in the younger generation could enable women to move out of agriculture [15].

Young women learn to cook from their mothers. It is traditional knowledge that is passed from generation to generation through experience. It's obvious that the transfer of knowledge in cooking is dependent on mother-daughter relations. Since most of the young girls have less time together with their mother due to the time requirement of school, only a few of them are now involved in the kitchen.

## **Conclusion**

The matriarchal system is still playing an important role in food culture in Minangkabau. The mother plays an important role in kitchen activity, meal decision and land ownership, although she is not involved directly in activities on the land itself (farming). The educational background and less time for mother-daughter activity increasingly threaten the ability to pass the knowledge of food preparation on to the next generation. The mother has a potential role to increase the food diversity (food culture) in the household by using local food diversity or by cultivating spices in the backyard. Men tend dominantly to work at the farm and going fishing, women work in the kitchen. Thus matriarchal

system determines the kitchen as women's activity and women still play an important role in managing farm to fork activities.

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