



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

No endorsement of AgEcon Search or its fundraising activities by the author(s) of the following work or their employer(s) is intended or implied.

Date	Submitted	Accepted	Published
	11 June 2023	21 st June 2023	29 th February 2024

PERSPECTIVES OF RURAL FARMER HOUSEHOLDS ON FOOD SECURITY THROUGH A QUALITATIVE STUDY IN INDONESIA

Yusriadi Y^{1*}, Junus D², Wijayanti R³, Hasnawati¹ and A Cahaya¹



Yusriadi Yusriadi

*Corresponding author email: yusriadi.yusriadi@uqconnect.edu.au

¹Faculty of Social and Humanities, Universitas Cahaya Prima, Indonesia

²Faculty of Social and Political Sciences, Universitas Gorontalo, Indonesia

³Department of Mathematics Education, STKIP PGRI Bangkalan, Indonesia



ABSTRACT

In developing countries, rural farmers contribute significantly to food production, but their households are still vulnerable to poverty, food insecurity, malnutrition, and stunting. Although quantitative studies have explored the factors that influence farmers' dietary diversity, the data can be improved by integrating farmers' experiences and perspectives on whether and how these factors affect their dietary diversity. Malnutrition and food insecurity are more prevalent in developing and underdeveloped nations like Africa and Southeast Asia. Due to increased work, this country usually sees a rise in stunting, malnutrition, and increased physical activity. Stunting has a higher prevalence than other nutritional disorders, such as malnutrition, according to Nutrition Status Monitoring (NSM) data over the last three years. The frequency of stunting in children under five has risen from 27% in 2016 to 29% in 2017. This will assist in designing and implementing interventions. Forty rural farmers in Bone Regency, Indonesia, became informants in targeted interviews as part of the qualitative study (20 male and 20 female farmers). According to the research results, both male and female informants were concerned about the availability and variety of food. They feel that household food production is essential to achieve food security. Food sales are affected by prices, household income, distance to markets, and the range of food available. Household food production, knowledge, nutrition, availability, use of information, time, and household income are significant determinants of the variety of food consumed. In farming households, gender influences and variations on the distribution and use of food collected and income are explored. Men have more time to engage in agricultural endeavors that promote dietary diversity. Based on these findings, efforts to increase dietary diversity should address current food security and production challenges, support increased farm incomes and market access, utilize designs that address gender issues, and include nutrition capacity building, diverse practices, and social behavior change strategies.

Key words: rural farmers, food security, food diversity, nutrition, market access, Indonesia



INTRODUCTION

Rural farmers generate 40-70% of the food consumed in developing countries [1]. They are, nonetheless, the most vulnerable to hunger, poverty, and food insecurity due to obstacles such as low productivity, knowledge, and skills. Climate change and the COVID-19 pandemic are problems, as is farming households' ability to tackle them [2]. Malnutrition and food insecurity are more prevalent in developing and underdeveloped nations like Africa and Southeast Asia [3]. Due to increased work, this country usually sees a rise in stunting, malnutrition, and increased physical activity [4].

Stunting has a higher prevalence than other nutritional disorders, such as malnutrition, according to Nutrition Status Monitoring (NSM) data over the last three years. The frequency of stunting in children under five has risen from 27% in 2016 to 29% in 2017 [5]. The prevalence of stunting among children under the age of five in Indonesia tends to be static; NSM research data from 2007 showed that the prevalence of stunting among children under the age of five in Indonesia was 37%, rising to 38% in 2013 [6]. The Central Statistics Agency for 2020 shows that the daily calorie consumption of the Indonesian population has reached 2.112 Kcal; the average calorie consumption in Indonesia has decreased by 8.46 Kcal compared to the previous year, in March 2020, it was 2.112 Kcal while in March 2019 it was 2.120 Kcal, besides that, in the village, there is a risk of 13% lack of calories [7]. In addition, the quality of household food is still lacking, with 20-40% of calorie intake coming from staple foods, especially rice and wheat, while the contribution of tubers is still low [8]. Regarding food security, at the national level, 5.24% of households face pressure from food insecurity. In addition, protein consumption decreased by 1.05 grams per day, low frequency of eating up to one meal a day, low food diversity, and no food stocks [9].

A high-quality diet is one of the prerequisites for supplying nutrition, immunity, and stunting prevention, and it is generated sustainably. This is distinguished by healthy eating habits and is dependent on food availability and natural factors [10,11,12]. However, such diets are not available to many people because two billion people worldwide are food insecure, 700 million people confront extreme food insecurity and hunger [13], and food insecurity and malnutrition are highlighted in Indonesia.

Several quantitative studies have investigated the determinants of dietary diversity among rural farmers. The study's findings covered income, daily food fulfillment, land ownership, agricultural variety, degree of education, training, access to water, number of households, gender, nutrition awareness, and market access. Some of these elements have the potential to improve food security and diversity in rural



farming households [14]. Through qualitative research, this information can be supplemented with rural farmers' experiences and viewpoints on how these factors affect food security. Qualitative research allows us to understand better behavioral patterns related to farmers and the farmer environment and shape critical environmental issues crucial to rural farmers [15,16,17]. Whereas quantitative studies clarify conditions, cause-and-effect linkages, and test hypotheses, qualitative studies can reveal underlying reasons and mediators, allowing treatments and messages to be adjusted [18].

Qualitative reports from Bone Regency have demonstrated the significance of food security and farmer households' diets [13]. Furthermore, agriculture, agrobiodiversity, income, socioeconomic position, livelihood diversity, climate changes, and the number of families affect farmers' ability to produce, consume, and purchase various foods [14]. Nonetheless, there is a need for additional qualitative research on rural farmers' experiences and opinions, not only on the drivers of food security but also on how limiting constraints might be addressed and made sustainable. Such analyses must also disaggregate the gender viewpoints and dynamics in each context.

As a result, this study aims to identify community attitudes, gender, nutrition, food security, dietary diversity, and their determinants among farming households in Bone Regency. What is the community's and gender's experience and perspective on family feeding habits, as well as household food availability and access, is the research question being investigated. What are the determinants of dietary diversity, according to rural farmer experience and perspective?

METHODOLOGY

Study site and sample

In June-September 2023, a qualitative study was undertaken among rural farming households in Bone District to identify social norms and community perceptions on food diversification and security. Bone Regency, located in Indonesia's middle area, has two primary seasons (rainy and dry) and a yearly production system. Rice, cocoa, coffee, oil palm, clove, and maize cultivation are the primary production systems. There is also animal farming, particularly cattle, goats, and poultry [13]. Food security dynamics at the research sites are similar not only to surrounding districts in central Indonesia but also to rural farming communities throughout the country and rural farmers in rice-based farming systems in Southeast Asia [19].

The two sub-districts of Mare and Ponre were deliberately chosen based on the access and mobility of their population, most of whom are farmers, as well as their short distance. Ten villages were selected non-randomly from the two sub-districts.



As part of the research, the number of research informants was obtained from 40 farmer households with at least one child aged at least 12 months.

Twenty men and twenty women from farmer household informants participated in structured interviews. In each sub-district, structured interviews were held with male and female informants. Separate structured interviews for men and women were conducted. Participants have a broad education, graduating from elementary, junior high, and high school with farming as their main occupation. Structured interview informants have an average age of 35 years. The average age of the informants was 40 years for men and 34 years for women.

The interview used the guide to investigate; 1) food consumed by household members; 2) the extent to which the food consumed fulfills nutrition; 3) how the food consumed in farmer households is obtained; 4) what factors determine the food consumed; and 5) how households cope with the challenges they face in accessing and consuming various foods. Interviews were conducted in the local language by qualified facilitators, note-takers, and audio recordings. Before starting the interview activity, each participant agreed to written information to participate and record the discussion. District officials were also asked for communications and permits. The Research Ethics Committee of the Universitas Cahaya Prima, approved the research protocol.

Data analysis

An analytical framework approach is used to uncover patterns and themes in answering various questions to capture research topics and questions [20]. The facilitator copies and checks the audio recordings of the interviews and field notes to ensure their quality. Audio recordings are also used for transcription cross-checking. This analysis entails identifying the theme codes, coding the data, and comparing the themes and codes across interviews. The codes are then grouped into a matrix based on how they relate to emerging themes, how they can be used to answer research questions, and how they interact.

RESULTS AND DISCUSSION

Dietary habits

The meals that are prepared for members of the family are, for the most part, equivalent to those prepared for the other people who live in the house. Children still breastfed are given porridge made from soybeans or green beans, added vegetables, and sometimes given fruit after meals. Although this is not a common practice, it is done because children still being breastfed are given different foods than the other household members.



Rice, fish, eggs, fried bananas, corn, and cassava are often eaten as staple foods. In addition, people usually eat chicken or beef before the holidays (Eid al-Fitr and Eid al-Adha). Papaya, rambutan, mango, and jackfruit are some fruits that are often consumed. Peanuts and soybeans are examples of foods of plant origin, while eggs and mackerel are examples of foods of animal origin. Because of their higher prices, foods of animal origin, such as chicken and beef, are not eaten as often as they used to be. Salmon, eggs, poultry, cattle, and cooking oil are examples of other goods whose consumption is influenced by the expenses and incomes of individual households. Some informants in each interview considered that the family's diet was sufficient, but some other participants considered it insufficient. However, more responses indicate inadequate diets, primarily due to a lack of money to purchase favorite meals.

When looking at the interview participants' perceptions of a good diet, they were classified into three groups: 1) sufficient food is food that provides satisfaction for the family; 2) food adequacy if it is not monotonous and includes a variety of foods such as rice, eggs, spinach, and mackerel; 4) sufficient food according to the age of each household member. For example, soft food is considered a good side dish for children and the elderly, and rice is chosen over corn. Participants also acknowledged that the proper diet is subjective because what their family thinks is acceptable may not be perceived by others.

Other perceptions regarding family eating were explored, with the most common perception being that children and parents need to eat different meals, such as fish, eggs, rice, spinach, and chicken, on occasion. This perception was discussed along with other perceptions regarding family feeding. Second, offering leftovers from earlier meals, particularly at supper, was a typical practice approved by many participants. Regarding perceptions of food and feeding for youngsters and the elderly, there were no differences between male and female interviews. Participants liked the food that could be heated at night; however, this was only sometimes the case. Thirdly, infants under one year of age are required to be nursed, and as they age, the frequency of nursing decreases, and the type of food varies.

Food availability and access in the family

Produce grown on the family farm, food bought at the local market, food gathered from the wild, and food earned as a reward for labor is the primary means by which rural farming households receive their sources of nutrition. The informants in the interview unanimously decided that most of the food consumed was produced from crops in the farmer's household. Because markets are located significantly from their village, they only seldom purchase food from the market.



Every informant in the interview said they agreed that maintaining a healthy and balanced diet is very important; however, the ability to do so is highly dependent on the monthly income of the farming household. Consumption of food of animal origin is limited due to high production costs causing not all households to raise poultry. To access animal-based foods, families must leverage their existing income or sell other food products on the market to obtain the money needed to buy animal-sourced foods. The former is the preferred scenario, as food prices do not allow for sufficient purchases.

In contrast to vegetables available throughout the season, fruit consumption is strongly associated with climate change (rainy and dry). Fruit consumption is observed to be low during long dry seasons. Interview informants said that when there was a shortage of fruit from their gardens during the dry season, farming households did not buy them immediately, even though they had more income. Most informants stated that they ate fruits grown in their gardens.

There is a correlation between commercially cultivated fruit varieties and fruit availability. Therefore, the greater the variety of fruit that farmers grow, the greater their access to fruit that grows in a particular season. For example, during the rainy season, people eat a lot of breadfruit, rambutan, and papaya. This is because farmers grow more types of fruit. Second, because fruit is one of the products that farmers can use to generate income for their household, the quantity of fruit available for household consumption is sometimes limited. There were no differences in views regarding food availability and access food to farming households that emerged from the interviews of men and women.

Food diversity indicators

The interview uncovered factors determining dietary diversity and the techniques participants utilized or suggested to enhance the situation. The production of food on farms, farmers' education and comprehension of nutrition, farmers' ability to make use of information, and farmers' income. In the interview, the informants revealed that food production is influenced by the availability and area of land, plant pests, and, most importantly, climate fluctuations. A wide variety of farming activities and rearing of poultry that are kept directly contribute to the diversity of the diet of farmer households. The narrowness of the land in the part of the farmer's household sometimes limits the diversity of plants planted. In addition, access to clearing new land sometimes fails to follow the crops to be planted, and the costs are high.

The influence of plant pests is often the cause of the use of pesticides by rural farmers, thereby increasing production costs. In addition, there are climate fluctuations in Indonesia, where rainfall is difficult to predict; also, a long dry



season will yield negative harvest results. As a result, interview informants said that farmers needed additional income to manage more land and buy materials for agricultural activities, such as fertilizers and pesticides, to prevent pests and plant diseases.

The availability of adequate information also affects land selection and agricultural management access. Informants said that farmers usually plant crops they have often planted, which assures good yields, thus increasing the income of the farmer's household. Foods including papaya, corn, bananas, cocoa, rice, coffee, vegetables, and fruits are included in this category. In addition, one of the factors to consider is planting seasonal crops. These include crops that mature rapidly, are available throughout the year, and are especially useful during times of scarcity or plants that are "easy" to produce, meaning they require fewer resources and fewer hours of labor. Plants with a rapid maturation rate are recommended since they cut the dry season shorter. Plants that demand less human effort free up more time to cultivate other kinds of vegetation.

The informants submitted several foods for food composition, nutritional fulfillment, and maintaining health. Various eating patterns were seen as consuming different food groups some people. This view was prevalent in two sub-districts (Mare and Ponre sub-districts). Several interview informants reported that eating a diverse range of meals was particularly helpful to one's health. Yet, other participants stated that eating diverse foods required a considerable financial investment. Some people still need to understand what constitutes a balanced diet, emphasizing the necessity for fulfilling nutritional needs.

Most interview informants acquired the skills, information, and knowledge that informed their practices and decisions regarding food production, purchasing, and consumption from their families, friends, and neighbors. In addition, the informants also obtained agricultural information and knowledge from training conducted by agricultural extension workers, the media (offline and online), and other farming communities who had previously attended agrarian training. However, implementing agricultural practices based on the knowledge gained is inconsistent, with many farmers returning to old methods after some time. Because the lack of resources such as money, seeds, land, energy sources, and time causes this phenomenon. In addition, laziness or lack of motivation is another reason that causes them to abandon the practical application of their training; examples of push factors include village government or agricultural extension.

In the interview with female participants, many mentioned that more time was needed for various agricultural products. Because various other activities, such as



being a housewife, having to cook for the family at home, and taking care of the house and children, are also carried out.

The results of interviews with several informants, the lack of income and high prices during the COVID-19 pandemic made it difficult for farming households to fulfill several food groups, especially those originating from animals. Informants also said that they sell more agricultural produce to cover the increased costs for things such as school fees, medical expenses if a family member is sick, daily necessities, and pesticides for agriculture, as well as to supplement household income, done by selling the produce they have produced for their families. Interviews with female informants stated that men are more likely to sell all their crops after harvest. Meanwhile, women always ensure that there is always a share for the family from the harvest they get.

The experiences of farm households about the factors that determine food diversity are the same in many sub-districts. The only exception concerns the availability of sufficient information. Compared to the Mare and Ponre sub-districts show much higher misinformation. In addition, several interviews with informants revealed that they needed more accurate knowledge about what is meant by a balanced diet and the importance of getting adequate nutrition.

Perspectives of rural farmer households on food security

According to the findings obtained from the interviews, the most important factors that determine the variety of foods consumed by farm households are their level of production at home, their level of agricultural expertise, the nutrition they consume, the amount of time they have available, and their income. The proximity of a person's home to nearby markets, the cost of food and the range of options available at those markets, and the interplay of gender dynamics are also important factors.

Some food is available in the community, starting from production and market availability, which primarily consists of staple foods, such as rice, corn, vegetables, fruits, and animal products [21,22,23,24]. In addition, some informants considered that the family's diet was adequate, but others also considered it inadequate, with various perceptions regarding the elements of an adequate diet.

Food was primarily derived from own farm output and markets, with own production viewed as crucial. The informant's villages place further away from marketplaces that carried a wider variety of foodstuff; therefore, it was difficult for them to buy different food groups because of the high prices. Both the patterns of food intake in households and the variety of diets people eat are influenced by the production methods used by farmers, whether those methods involve crop, livestock, or market access [25,26, 27]. Growing a wide variety of crops has the



added benefit of providing farmers with various food choices and additional income. These benefits include reduced risk from climate fluctuations resulting in poor crop yields and low crop prices [16].

It was found that the level of production diversity has a greater influence on the level of food diversity in poor households with low levels of agricultural diversity and limited market access due to factors such as long distances traveled. However, the effect of production diversity on dietary diversity is less significant for households with greater access to markets and a higher income [28,29]. Therefore, to increase their dietary diversity and food security, it is necessary to address similar smallholder farmers' productivity, production diversity, and market access [17].

Consumption of fruits and vegetables was restricted due to seasonal availability, and the absence of these foods could have resulted in the procurement of replacements even when money was available. Informants highlighted that the availability of various foods and the consumption of households were also linked to the diversity of agriculture produced and the potential income may generate because most agricultural products were sold. Through agrobiodiversity evaluations, farmers may take advantage of the variety of food diversity available to households to address seasonal access difficulties [29]. The study results show that increasing the number of accessible micronutrient-rich food varieties and making them more readily available throughout the year can increase the consumption of farm households [30,31,32,33]. In addition, the decline in farm household income is associated with the low demand for food in Southeast Asia after the COVID-19 pandemic [30,34]. Therefore, for research locations, this decrease in income can increase the amount of food sold, thereby increasing its availability for household consumption.

Farm household food diversity is influenced by food production from rural farmers, which is related to the size of the land, the fertility of the farming area, plant pests, and climate fluctuations. The production challenges noted are like previous studies for farming households in Indonesia [13, 21]. Informants in ethnographic studies in Indonesia also linked the factors of food diversity, food availability, and agricultural production [35]. This study illustrates that addressing production challenges for rural farmers will significantly assist in shaping food diversity and household food security.

Agricultural income and knowledge have been demonstrated to impact input and technology use and adoption [35,36,37,38], and boosting nutrition knowledge and skills have been shown to enhance dietary practices [19]. The knowledge and understanding of agricultural and nutritional practices affected the selection of



priority crops concerning food production, consumption, and diversity. Limited nutritional information was also recorded, including little knowledge and a variety of foods. This knowledge gap is directly related to the behaviors and decisions about agriculture and diet. Participatory methods and context-based interventions are more likely to be successful, given that rural farmers have specific knowledge and experience that can be used to solve problems [39]. Men and women farmers and cooperatives can serve as a basis for participatory techniques, community engagement, and empowerment of rural farmers [14,19].

The availability of accessible information access and pre-existing farming communities need to be leveraged to effectively enhance farmers' knowledge, and skills regarding agricultural activities and understanding of nutrition revealed in research. The lack of a push factor reported in this study, which affected the sustained adoption of learned practices and their impact, could be addressed through the provision of support by community networks for adopting and implementing procedures that support household food and nutrition security. Meetings and workshops for rural farmers provide opportunities to exchange and receive knowledge that can improve the quality of diet in fulfilling nutrition and the ability of farmers to avoid food insecurity [40]. Several variables may affect a farmer's behavior, including an individual's and their community's beliefs and attitudes, the local culture, the economic climate, and the availability of resources [41,42]. Developing a social behavior may help to influence communication techniques, establish social support, boost the intervention effect, and empower the target farmers [30]. Using more than one method has proven to be more effective than using only one method, and a small number of procedures has proven to be more effective than many other techniques [10]. Therefore, to improve access to information and the effectiveness of farmer meetings and training, a social behavior change strategy with appropriate behavior change methods that utilize and address this study's determinants should be developed.

Time is one of the factors mentioned by female farmers, which affects agricultural diversity and the fulfillment of nutrition for families. Several studies have pointed to the passage of time as a factor influencing how families are fed and the variety of foods they consume [40]. Although agricultural interventions tend to increase the time commitment of rural farming families, women farmers experience this disproportionately because of the central role they play in agriculture, as well as managing the household for nutrition. In addition, various family members react differently to the increased time pressures and workload, which has consequences for the dietary benefits [28,29]. Therefore, it is essential that these gender concerns be included in the assessment of intervention designs and that time-sensitive practices be incorporated into the plans.



Household income does affect not only the ability of farmers to meet their subsistence needs but also affects the production of crops that are set aside for the consumption of farmer households and the distribution of these crops to meet several other needs [32]. This information describes food security concerning food production or reported income in rural farming households. The male farmers explained that they sold more crops, affecting household food insecurity and diversity. Income is a well-reported predictor of food security and dietary variety, impacting both directly via buying power and indirectly through agriculture and agrobiodiversity [28].

The enhancement of the income and standard of living of farmers is a primary focus of both global policies. To this goal, it has been advocated that farmers' households increase they're on- and off-farm incomes and become more efficient in their use of these resources [24]. Advancing gender equality should also be a priority, according to the recommendations. Agricultural interventions' influence on diets and other nutritional outcomes is increased when women are given more agency. The effect varies depending on the situation since various cultures, gender norms, and degrees of empowerment have different expectations. As a result, gender roles in the food environment need to be recognized and leveraged in interventions to empower women and avoid any unexpected adverse effects on nutrition [27].

CONCLUSION, AND RECOMMENDATIONS FOR DEVELOPMENT

Food security and variety are concerns for both male and female farmers; both see food production in their households as very important. Household production, knowledge, awareness of agriculture and nutrition, access to and use of information, household income, and time of year were key factors of food variation. The price of foodstuff, especially foods derived from animals, the family's income, the distance to the market, and the variety of foods available at the market all had an impact on the amount of food purchased. Inadequate nutrition information, skills, and training in the farmers and a knowledge gap regarding the perception of dietary diversity. The distribution and use of harvest within families, male farmers have different views on training, and women have limited time for agricultural practices that increase food variety are all influenced by gender variations. The issues encountered in terms of food security and production should be addressed by efforts to enhance dietary variety. These efforts should also support revenue creation, whether on or off the farm and access to various foods on the market. The intervention's design must consider gender concerns and incorporate techniques that are attentive to labor and time. In addition, the development of capabilities in nutrition and behaviors that facilitate access to, and consumption of assorted food baskets is necessary. This can be increased by creating



communication strategies, building social support, increasing levels of empowerment, and further research on social behavior change.

ACKNOWLEDGEMENTS

We thank The Ministry of Education, Culture, Research and Technology of the Republic of Indonesia for sponsoring this research and Universitas Cahaya Prima. We appreciate the Bone Regency Government for arranging field activities and the villagers for allowing us access to their community.

FUNDING

Funding for this research was provided by the Ministry of Education, Culture, Research, and Technology of the Republic of Indonesia. The funder had no role in the design, data collection, analysis, interpretation, or publication decision.



REFERENCES

1. **Reardon T, Echeverria R, Berdegue J, Minten B, Tasie SL, Tschirley D and D Ziberman** Rapid transformation of food systems in developing regions: Highlighting the role of agricultural research & innovations. *Agric Syst.* 2019; **vol. 172**: 47–59. <https://doi.org/10.1016/j.agsy.2018.01.022>
2. **Lioutas ED and C Charatsari** Enhancing the ability of agriculture to cope with major crises or disasters: What the experience of COVID-19 teaches us. *Agric Syst.* 2021; **vol. 187**: 103023. <https://doi.org/10.1016/j.agsy.2020.103023>
3. **Smith LC, el Obeid AE and HH Jensen** The geography and causes of food insecurity in developing countries. *Agricultural Economics.* 2000; **vol. 22**: 199–215. <https://doi.org/10.1111/j.1574-0862.2000.tb00018.x>
4. **Popkin BM, C Corvalan and LM Grummer-Strawn** Dynamics of the double burden of malnutrition and the changing nutrition reality. *The Lancet.* 2020; **vol. 395**: 65–74. [https://doi.org/10.1016/S0140-6736\(19\)32497-3](https://doi.org/10.1016/S0140-6736(19)32497-3)
5. **Dranesia A, D Wanda and H Hayati** Pressure to eat is the most determinant factor of stunting in children under 5 years of age in Kerinci region, Indonesia. *Enferm Clin.* 2019; **vol. 29**: 81–86. <https://doi.org/10.1016/j.enfcli.2019.04.013>
6. **Sumardilah DS and A Rahmadi** Risiko stunting anak baduta (7-24 bulan). *Jurnal Kesehatan.* 2019; **vol. 10**: 93–104.
7. **Widyaningrum B, O Helbawanti, N Khoerunisa and A Srigustini** Penganekaragaman Bahan Pangan Sebagai Strategi Mempertahankan Daya Tahan Tubuh Di Masa Pandemi Covid-10. *Jurnal ABDINUS: Jurnal Pengabdian Nusantara.* 2022; **vol. 6**: 531–541.
8. **Kurniawan R** Variasi Pengaruh Program Beras Miskin (Raskin) Terhadap Konsumsi Makanan Rumah Tangga. *Jurnal Ekonomi dan Pembangunan.* 2019; **vol. 27**: 1–10.
9. **Ramadhan R, K Prawita, MA Izzudin and G Amandha** Analisis strategi dan klasterisasi ketahanan pangan nasional dalam menghadapi pandemi covid-19. *Teknologi Pangan : Media Informasi dan Komunikasi Ilmiah Teknologi Pertanian.* 2021; **vol. 12**. <https://doi.org/10.35891/tp.v12i1.2179>



10. **Fanzo J** Strengthening the engagement of food and health systems to improve nutrition security: Synthesis and overview of approaches to address malnutrition. *Glob Food Sec.* 2014; **vol. 3**: 183–192.
<https://doi.org/10.1016/j.gfs.2014.09.001>
11. **Raiten DJ and AM Aimone** The intersection of climate/environment, food, nutrition and health: crisis and opportunity. *Curr Opin Biotechnol.* 2017; **vol. 44**: 52–62. <https://doi.org/10.1016/j.copbio.2016.10.006>
12. **Reinhardt K and J Fanzo** Addressing Chronic Malnutrition through Multi-Sectoral, Sustainable Approaches: A Review of the Causes and Consequences. *Front Nutr.* 2014; **vol. 1**.
<https://doi.org/10.3389/fnut.2014.00013>
13. **Yusriadi Y and A Cahaya** Food security systems in rural communities: A qualitative study. *Front Sustain Food Syst.* 2022; **vol. 6**.
<https://doi.org/10.3389/fsufs.2022.987853>
14. **Quisumbing AR, D Rubin, C Manfre, E Waithanji, M Bold, D Olney, N Johnson and R Meinzen-Dick** Gender, assets, and market-oriented agriculture: learning from high-value crop and livestock projects in Africa and Asia. *Agric Human Values.* 2015; **vol. 32**: 705–725.
<https://doi.org/10.1007/s10460-015-9587-x>
15. **Davies BB and ID Hodge** Exploring environmental perspectives in lowland agriculture: A Q methodology study in East Anglia, UK. *Ecological Economics.* 2007; **vol. 61**: 323–333.
<https://doi.org/10.1016/j.ecolecon.2006.03.002>
16. **Feola G, AM Lerner, M Jain, MJF Montefrio and KA Nicholas** Researching farmer behaviour in climate change adaptation and sustainable agriculture: Lessons learned from five case studies. *J Rural Stud.* 2015; **vol. 39**: 74–84. <https://doi.org/10.1016/j.jrurstud.2015.03.009>
17. **Reimer AP, AW Thompson and LS Prokopy** The multi-dimensional nature of environmental attitudes among farmers in Indiana: implications for conservation adoption. *Agric Human Values.* 2012; **vol. 29**: 29–40, 2012.
<https://doi.org/10.1007/s10460-011-9308-z>
18. **Reeves S, M Albert, A Kuper and BD Hodges** Why use theories in qualitative research?. *BMJ.* 2008; **vol. 337**: a949.
<https://doi.org/10.1136/bmj.a949>



19. **Akter S, P Rutsaert, J Luis, NM Htwe, SS San, B Raharja and A Pustika** Women's empowerment and gender equity in agriculture: A different perspective from Southeast Asia. *Food Policy*. 2017; **vol. 69**: 270–279, 2017. <https://doi.org/10.1016/j.foodpol.2017.05.003>
20. **Vaismoradi M, H Turunen and T Bondas** Content analysis and thematic analysis: Implications for conducting a qualitative descriptive study. *Nurs Health Sci*. 2013; **vol. 15**: 398–405. <https://doi.org/10.1111/nhs.12048>
21. **Ali MSS, A Majika and D Salman** Food Consumption and Production in Tempe Lake, South Sulawesi, Indonesia. *Journal of Asian Rural Studies*. 2017; **vol. 1**: 43–52, 2017.
22. **Sukenti K, L Hakim, S Indriyani, Y Purwanto and PJ Matthews** Ethnobotanical study on local cuisine of the Sasak tribe in Lombok Island, Indonesia. *Journal of Ethnic Foods*. 2016; **vol. 3**: 189–200. <https://doi.org/10.1016/j.jef.2016.08.002>
23. **Harmayani E, AK Anal, S Wichienchot, R Bhat, M Gardijito, U Santoso, S Siripongvutikorn, J Puripaatanavong and U Payyappallimana** Healthy food traditions of Asia: exploratory case studies from Indonesia, Thailand, Malaysia, and Nepal. *Journal of Ethnic Foods*. 2019; **vol. 6**: 1. <https://doi.org/10.1186/s42779-019-0002-x>
24. **Orsini F, R Kahane, R Nono-Womdim and G Gianquinto** Urban agriculture in the developing world: a review. *Agron Sustain Dev*. 2013; **vol. 33**: 695–720. <https://doi.org/10.1007/s13593-013-0143-z>
25. **Valbuena D, O Erenstein, S Homann-Kee Tui, T Abdoulaye, L Claessens, AJ, Duncan, B Gerard, MC Rufino, N Teufel, A Rooyen and MT van Wijk** Conservation Agriculture in mixed crop–livestock systems: Scoping crop residue trade-offs in Sub-Saharan Africa and South Asia. *Field Crops Res*. 2012; **vol. 132**: 175–184. <https://doi.org/10.1016/j.fcr.2012.02.022>
26. **Passarelli S, D Mekonnen, E Bryan and C Ringler** Evaluating the pathways from small-scale irrigation to dietary diversity: evidence from Ethiopia and Tanzania. *Food Secur*. 2018; **vol. 10**: 981–997. <https://doi.org/10.1007/s12571-018-0812-5>



27. **Sibhatu KT and M Qaim** Farm production diversity and dietary quality: linkages and measurement issues. *Food Secur.* 2018; **vol. 10**: 47–59. <https://doi.org/10.1007/s12571-017-0762-3>
28. **Mehraban N and A Ickowitz** Dietary diversity of rural Indonesian households declines over time with agricultural production diversity even as incomes rise. *Glob Food Sec.* 2021; **vol. 28**: 100502. <https://doi.org/10.1016/j.gfs.2021.100502>
29. **Sibhatu KT, Vv Krishna and M Qaim** Production diversity and dietary diversity in smallholder farm households. Proceedings of the National Academy of Sciences. 2015; **vol. 112**: 10657–10662. <https://doi.org/10.1073/pnas.1510982112>
30. **Nabuuma D, B Ekesa, M Faber and X Mbhenyane** Community perspectives on food security and dietary diversity among rural smallholder farmers: A qualitative study in central Uganda. *J Agric Food Res.* 2021; **vol. 5**: 100183. <https://doi.org/10.1016/j.jafr.2021.100183>
31. **Ahmed M and MH Lorica** Improving developing country food security through aquaculture development—lessons from Asia. *Food Policy.* 2002; **vol. 27**: 125–141. [https://doi.org/10.1016/S0306-9192\(02\)00007-6](https://doi.org/10.1016/S0306-9192(02)00007-6)
32. **Saltzman A, E Birol, A Oparinde, MS Andersson, D Asare-Marfo, MT Diressie, C Gonzalez, K Lividini, M Moursi and M Zeller** Availability, production, and consumption of crops biofortified by plant breeding: current evidence and future potential. *Ann N Y Acad Sci.* 2017; **vol. 1390**: 104–114. <https://doi.org/10.1111/nyas.13314>
33. **Kadiyala S, J Harris, D Headey, S Yosef and S Gillespie** Agriculture and nutrition in India: mapping evidence to pathways. *Ann N Y Acad Sci.* 2014; **vol. 1331**: 43–56. <https://doi.org/10.1111/nyas.12477>
34. **Fan S, P Teng, P Chew, G Smith and L Copeland** Food system resilience and COVID-19 – Lessons from the Asian experience. *Glob Food Sec.* 2021; **vol. 28**: 100501. <https://doi.org/10.1016/j.gfs.2021.100501>
35. **Dwiartama A, M Kelly and J Dixon** Linking food security, food sovereignty and foodways in urban Southeast Asia: cases from Indonesia and Thailand. *Food Secur.* 2022. <https://doi.org/10.1007/s12571-022-01340-6>



36. **Ng'ang'a SK, DA Jalang'o and EH Girvetz** Adoption of technologies that enhance soil carbon sequestration in East Africa. What influence farmers' decision?. *International Soil and Water Conservation Research*. 2020; **vol. 8**: 90–101. <https://doi.org/10.1016/j.iswcr.2019.11.001>
37. **Paris TR** Crop–animal systems in Asia: socio-economic benefits and impacts on rural livelihoods. *Agric Syst*. 2002; **vol. 71**: 147–168. [https://doi.org/10.1016/S0308-521X\(01\)00041-5](https://doi.org/10.1016/S0308-521X(01)00041-5)
38. **Kebede Y, K Gunjal and G Coffin** Adoption of New Technologies in Ethiopian Agriculture: The Case of Tegulet-Bulga District, Shoa Province. *Agricultural Economics*. 1990; **vol. 4**: 27–43. <https://doi.org/10.1111/j.1574-0862.1990.tb00103.x>
39. **Phuong LTH, A Wals, LTH Sen, NQ Hoa, P van Lu and R Biesbroek** Using a social learning configuration to increase Vietnamese smallholder farmers' adaptive capacity to respond to climate change. *Local Environ*. 2018; **vol. 23**: 879–897. <https://doi.org/10.1080/13549839.2018.1482859>
40. **Beuchelt TD and L Badstue** Gender, nutrition- and climate-smart food production: Opportunities and trade-offs. *Food Secur*. 2013; **vol. 5**: 709–721, 2013. <https://doi.org/10.1007/s12571-013-0290-8>
41. **Brehm JM, BW Eisenhauer and RS Krannich** Community Attachments as Predictors of Local Environmental Concern: The Case for Multiple Dimensions of Attachment. *American Behavioral Scientist*. 2006; **vol. 50**: 142–165. <https://doi.org/10.1177/0002764206290630>
42. **Karami E and A Mansoorabadi** Sustainable agricultural attitudes and behaviors: a gender analysis of Iranian farmers. *Environ Dev Sustain*. 2008; **vol. 10**: 883–898, 2008. <https://doi.org/10.1007/s10668-007-9090-7>

