Enrichment: Journal of Management, 13 (4) (2023)

Published by: Instiute of Computer Science (IOCS)

Enrichment: Journal of Management

Journal homepage: www.enrichment.iocspublisher.org

Strategies for sustainable livelihoods of shallot picking workers households in Brebes Regency

Muhammad Fauzan[1], Gordius Woltman Tuga[2]

[1]Department of Agribusiness, Faculty of Agriculture, Universitas Muhammadiyah Yogyakarta, Indonesia

[2]Department of Agrotechnology, Sekolah Tinggi Pertanian Flores Bajawa, Indonesia

ARTICLE INFO

Article history:

Received Oct 04, 2023
Revised Oct 07, 2023
Accepted Oct 23, 2023

Keywords:

Income;
Livelihood Strategies;
Picking Workers;
Shallot

ABSTRACT

This study aims to analyze the income of shallot-picking workers and their contribution to the total household income and to identify the strategies of the shallot-picking workers to achieve sustainable livelihoods. This study used primary data from a survey of 45 respondents using a questionnaire and was analyzed descriptively. The results showed that the income of shallot-picking workers in Brebes Regency was classified as significant towards total household income. This shows that picking workers depends on their livelihood from this job. Household strategies to support the achievement of sustainable livelihoods were included in the accumulation strategy. Increasing the welfare of extracted workers can be done by increasing productive activities.

Corresponding Author:

Muhammad Fauzan
Department of Agribusiness, Faculty of Agriculture
Universitas Muhammadiyah Yogyakarta
Jl. Brawijaya, Kasihan Bantul Yogyakarta 55183 Indonesia
Email: muhammad.fauzan@umy.ac.id

INTRODUCTION

Brebes Regency is one of the main shallot production centers in Indonesia. Shallots for Brebes Regency is a trademark, considering its position as the largest producer of this commodity at the national level, and it has a good brand image for shallot consumers in Indonesia. Brebes shallots are known for their better quality than shallots originating from other regions in Indonesia or abroad, such as Thailand and China (Susanawati & Fauzan, 2019). The shallot planting season in Java is almost entirely carried out simultaneously (Kamardiani et al., 2021; Triyono et al., 2021), but shallot production in Brebes Regency occurs throughout the year regardless of the season.

The shallot production and trade system in Brebes Regency does not only involve farmers and intermediaries but also pickers, whom women dominate. The role of women as picking workers occurs during the post-harvest process. Picking labor begins with cutting the leaves on the shallot bulbs, cleaning the freshly harvested bulbs, sorting, and grading. Sorting activities are carried out to separate the shallot bulbs from those that are deformed, rotten, and affected by pests and diseases. For grading activities, they picked workers group shallots into size and quality levels determined by farmers.

The shallot-picking workers in Brebes Regency do all their work at the shallot stalls. The shallot stall is a semi-open building used to accommodate the harvest of shallots. Stalls are generally built on the side of the main road near the shallot planting area. One of the shallot stall centers in Brebes Regency is in Luwungragi Village. Along the main road, more than 20 stalls are built to accommodate the harvest of shallots. Under normal harvest conditions, more than 30 picking workers are usually employed in one lap, and this will increase during the primary harvest season.

There are two types of picking workers: cut-picking and lapak picking workers. Cut-picking workers are picking workers whose job is to cut the leaves and roots of shallot bulbs. The lapak workers are in charge of separating the onion bulbs from the dirt and sorting and grading. The average working hour spent as a picker is 12 hours. Most picking workers work from six in the morning until five in the afternoon. Even when shallot production increases, the picking workers start work at five in the morning and often finish at ten in the evening.

As a laborer, picking shallots is the primary job to help the family's economy. Even though picking shallots spend much time outside the home, their responsibility to care for the household must be supported. In this case, picking workers must be able to divide their roles as picking laborers at the lapak and as housewives at home. Even though picking labor takes a lot of time and energy, the income generated can help support the household. Better livelihoods can reduce poverty levels and improve people's welfare in rural areas (Wood & Gough, 2006; Amoak et al., 2023; Weldemariam et al., 2023). This can be achieved if the community's livelihood is sustainable.

Etymologically, the word livelihood means assets or capital (natural, human, social, physical, financial) and activities mediated by institutions and social relations, which can explain the results obtained by individuals and households. Chambers & Conway (1991) explains that livelihood is a unity of abilities, assets, including material and social assets, and activities carried out to support life. Livelihoods can be sustainable if they can recover from stresses such as natural disasters using current assets and capabilities without relying solely on natural resources.

Five critical elements of the definition of sustainable livelihoods can be identified. Each corresponds to a broader guide; in some cases, there is a means of assessing the results. The first three focuses are livelihoods, linking work to poverty alleviation, and the broader issues of adequacy, security, well-being, and capability. The last two elements are the dimensions of sustainability, which will seek the resilience of livelihoods and essential natural resources on which they depend for life (Perrin et al., 2020; Das, 2021; Nhassengo et al., 2021). First, creation of working days. This relates to the ability of a particular combination of livelihood strategies to create gainful employment for a specific part of the year. This may be found on or off a farm, in a subsistence production system, or in wage labor. There are three work aspects: income, production, and rewards. In terms of income, various target levels of working time have been suggested, but 200 working days a year is widely used as the minimum level for creating a livelihood. Overall, the amount of livelihood created will depend on the proportion of the population available for work.

Second, poverty reduction. The poverty level is the main criterion in livelihood assessment (Islam et al., 2022; Pradhan et al., 2023). Various measures can be used to measure the absolute poverty line based on income or consumption levels. Substantial income is a material consideration in making decisions about using technology to increase production while increasing economic profits. Rosnita et al. (2014) stated that the income of female farmers in Riau can contribute 47.82% of the total family income. The poverty rate can be calculated in various ways, including using the Sayogyo, BPS, and World Bank criteria. The results of Puspitawati et al. (2019) state that the welfare of smallholder households, such as fishermen and farm laborers, both during the harvest and lean seasons, is in the moderate category. The number of family members and income per capita significantly positively affect family welfare. Third, well-being and capabilities. The notions of well-being and ability provide a broader definition of livelihood. A well-being approach to

analyzing livelihoods allows people themselves to determine which criteria are essential. The level of welfare is related to how the economy allocates resources and distributes commodities so that the welfare of society as a whole is maximized (Naeem et al., 2009). One approach to increasing the welfare of farmers to get out of the poverty trap is increasing access to land tenure by farmers and through the development of agricultural institutions, including strengthening the institutional capacity of farmers (Anantanyu, 2011).

Fourth, livelihood adaptation, vulnerability, and resilience. The ability of livelihoods to cope with and recover from stresses and shocks is the definition of sustainable livelihoods. Resilience in pressure and shock is the key to survival and livelihood adaptation (Barrett et al., 2021). Communities that need help to adapt are bound to be vulnerable and unlikely to achieve sustainable livelihoods. Assessing resilience and the ability to adapt positively requires an analysis of various factors, including evaluating the historical experience of responding to various shocks and stresses. Brebes Regency, a national center for shallot production for a long time, continues to face the turmoil of changes in weather and climate, which eventually lead to changes in the behavior of farmers and farm workers in dealing with problems of shallot production and trading system. New methods are needed as a form of adaptation for farmers to survive as shallot farming actors. One example is the emergence of organic or semi-organic shallot cropping systems (Fuady et al., 2015; Vebriyanti et al., 2018; Nugroho et al., 2019).

Fifth, natural resource base sustainability. In general, livelihoods in rural areas depend on natural resources to some extent. Sustainability of natural resources refers to the ability of the system to maintain its productivity when parties interfere with the preservation of natural resources. This means avoiding depleting the supply of natural resources to levels causing a permanent decline where the output of natural resources in products or services is helpful for livelihoods. Measuring the sustainability of natural resources is quite tricky. It is, therefore, crucial to link indicators of natural resource depletion or accumulation and livelihood needs. To fulfill human survival needs, paying attention to aspects of the sustainability of natural resources and the environment for the future is necessary. Sustainability can be achieved if, in every use of natural resources and the environment, attention is paid to the carrying capacity and capacity of the environment so that harmony is achieved between the natural environment and the built environment.

Livelihood strategies are choices shaped by the availability of land, existing assets, access to assets, and activities that are influenced by a person's or household's capacity. Sconnes (1998) classifies livelihood strategies into three groups, namely: (a) efforts to make the use of the agricultural sector more effective and efficient, either through the addition of external inputs in the form of labor or technology (intensification) or by expanding agricultural arable land (extensification), (b) businesses carried out by looking for work other than in the agricultural sector to increase income (diversification) and (c) Businesses are carried out by mobilizing or moving residents either permanently or temporarily in the context of finding new sources of livelihood elsewhere.

White (1991) distinguished household livelihood strategies into accumulation, consolidation, and survival strategies. The accumulation strategy is dynamic by farmers or farm laborers with many resources. In this case, large land areas are supported by production assets so that they can cultivate capital from surpluses obtained from an activity. The surplus is used to access higher productive resources from agriculture and non-agriculture. This group makes it possible to diversify business, interact, and even compete with outside markets.

The consolidation strategy for the middle group prioritizes the security and stability of income from processing owned resources. Suppose they succeed in consolidating resource assets and increasing production. In that case, they will gradually enter a group capable of carrying out a consolidation strategy or may degenerate into poor farmers who must carry out a survival

strategy. The survival strategy is used by small-scale farmers or farm laborers who generally only have narrow land. This group processes natural resources that are limited or forced to do anything, especially as laborers with low pay. To make a living without being able to save for capital development.

Utilization of household components in assets, access, and activities in the shallot production and trading system is expected to improve the livelihood of the picking labor household in Brebes Regency. In this case, picking workers must have the right livelihood strategy for sustainable livelihood. Based on this, this study aims to analyze the income of shallot-picking workers and their contribution to total household income and to identify the strategies of shallot-picking labor households to achieve sustainable livelihoods.

Hopefully, this research can add to the body of empirical knowledge in the context of sustainable livelihood strategies for agricultural worker households. Agricultural worker households are an essential focus in research because they are the smallest unit that will describe the success of a rural development program. National macro planning will benefit community welfare if the program can benefit households. In rural development, the welfare of agricultural workers' households indicates the success of rural development.

RESEARCH METHOD

The method used in this research is the descriptive method. This research was conducted in Luwungragi Village, Bulakamba District, Brebes Regency. This location was determined purposively considering that Luwungragi Village is a center for shallot stalls in Brebes Regency. We are determining the number of respondents using cluster sampling. In the first stage, one lap is randomly selected. Then, in the second stage, all the picking workers who work at the selected stalls will become respondents (census). The data collection technique uses the interview method with a questionnaire guide. The income of shallot-picking workers is calculated by adding up the total income from on-farm, off-farm, and non-farm activities for one month. To determine the contribution of income derived from livelihood strategies to total household income, the formula is used:

$$Y = \frac{Pn}{Pt} \times 100\%$$

Notes: Y = percentage contribution of picking workers income to total household income, Pn = income from picking workers, Pt = total household income

If the income contribution is <25%, then the contribution is negligible. If the income contribution is 25-49%, then the contribution is moderate. If the income contribution is 49-75%, then the contribution is significant. If the income contribution is >75%, then the contribution is enormous. The contribution of shallot-picking workers to total household income is calculated as a percentage. To identify the livelihood strategies of the shallot-picking workers households in Brebes Regency according to White's criteria, the following formula is used: (a) survival strategy: household income < mean - ($\frac{1}{2}$ × standard deviation), (b) consolidation strategy: between survival strategy and accumulation strategy, (c) accumulation strategy: household income > mean - ($\frac{1}{2}$ × standard deviation).

RESULTS AND DISCUSSIONS

The performance of a picking worker is strongly influenced by age, level of education, and experience. The age factor is essential because it affects a person's performance and physique in doing his job. Picking workers who are in their productive age will generally have high productivity. The analysis results show that the youngest picking worker is 30 years old, while the

oldest is 64 years old. The average age of workers at the Luwungragi Village shanties is 45 years, the productive age for work.

The education level of the shallot picking workers is in elementary schools, with a total of 41 or a percentage of 91.11%. In addition, farm workers with junior high school education totaled four people with a percentage of 8.89%. For picking workers with junior high school education, allotment of working time is with farm workers with elementary education. This is because the time and activities carried out by picking workers do not differ. In addition, working as a picker does not require high skills and creativity. This can indicate that the education level of picker workers is still relatively low. With low education, they still try to work productively to finish work as onion-picking laborers and be able to help the family economy.

The average experience of picking workers in carrying out their work is 20 years and seven months. Picking workers have been doing their job for a long time, starting from a productive age. This can be seen based on the experience of the picking workers. The youngest experience of a picking worker is two years, and the most extended experience is 37 years. The most experienced picking workers are three whose time and activities are the same as the others. However, when production increases, the picking workers with long experience receive additional activities such as packing.

Household income for picking workers generally comes from more than one source. Income can come from the head of the family (father), picking workers (wife), and children who already have income. The results showed that the household income of picking workers was divided into off-farm income and non-farm income. According to Suratiyah (1994), off-farm income is income from farming labor outside one's farm or working on someone else's farm, and non-farm income is income from sources other than agriculture. The household income of picking workers can be seen in Table 1.

Table 1. Household income of shallot picking workers in brebes regency

Description	Income (IDR)
Off-farm income	2.736.444
Non-farm income	558.222
Total income	3.294.667

Off-farm income comes from work as picking laborers, farm laborers, and fishermen. Non-farm income comes from jobs as construction workers, traders, drivers, pedicab drivers, and teachers. The results showed that the income from off-farm work was higher than that of non-farm. Income from work as a laborer picking onions contributes 56.36% to total household income, which is included in the category of significant contribution. This means that the shallot-picking laborers depend on their activities as picking laborers. If there is a disruption to their work, it will significantly affect the household economy of the picking workers. This study's results align with the findings of Amin et al. (2016), which revealed that the most significant income for farming households comes from donations by women farmers.

Apart from being a welfare measurement tool, household income can also be used to determine the various strategies shallot-picking workers use to achieve their household livelihood. The grouping of strategies chosen by shallot-picking workers in Brebes Regency can be seen in Table 2.

Table 2. Livelihood strategies of shallot picking workers' households in brebes regency

Strategy	Number of farmers	Percentage (%)
Survival	15	33.33
Consolidation	2	4.44
Accumulation	28	62.22
Total	45	100.00

To identify the livelihood strategies used by household pickers, the average and standard deviation of household income were first calculated; the average was IDR 3,294,667, and the standard deviation was 1,258,581. The analysis shows that most farming households apply the accumulation strategy (62.22%). Households that apply an accumulation strategy are farming households with high natural, physical, financial, human, and social assets. Accumulated households with owned assets can improve their welfare through productive activities. The productive activities chosen by accumulated households are intended for the long term in order to increase the livelihood component they have.

The second strategy of picking workers' households is survival (33.33%). Households that fall into this category have limited resources and assets. The income obtained relies on the outpouring of labor with limited skills. Households with a survival strategy work extra to meet their household needs by working odd jobs as farm and construction laborers.

The last strategy used by picking workers' households is the consolidation strategy (4.44%). Farmer households with a consolidation strategy generally have sufficient assets to support their family's livelihood by utilizing them to increase their family's income (Nurhadi et al., 2018). The income earned is also relatively high compared to households with a survival strategy. Consolidated farmer households can also develop themselves by utilizing assets for medium-term goals.

Assets, access, and activities are components of livelihoods used as capital to achieve sustainable livelihoods (Singh et al., 2018; Cafer et al., 2019; Cavalleri et al., 2022). Achieving sustainable livelihoods is one of the measurements using household income variables. Livelihood components include working capital, workforce and area, age, length of work, education (Ariska & Prayitno, 2019), number of family members (Amnesi, 2013), distance traveled to work (Ruswanty et al., 2019) has a positive effect on increasing income.

The income of a picking worker fluctuates up to the peak of profits and down to losses, while an employee or civil servant has a fixed salary that will increase in scale over a certain period. In non-agricultural societies, education will positively affect individual income because the salary for the position obtained will be based on the level of education (Julianto & Utari, 2019).

Assets in the form of means of transportation are one of the main supports in obtaining a source of livelihood. Picking workers who have means of transportation will have higher productivity because their mobility is faster and more flexible than other picking workers. Technology is essential for farmers or farm workers who depend on the agricultural sector for their livelihood (Wouterse, 2016). In addition, if workers have their own picking tools, farmers will be more flexible in using them than workers who do not have them, so they have to rent or borrow.

CONCLUSION

The income of shallot-picking workers in Brebes Regency is relatively large in total household income. This shows that the picking workers depend on this job for their source of livelihood. Household strategies to support the achievement of sustainable livelihoods are included in the accumulation strategy. Increasing the welfare of picking workers can be done by increasing productive activities. Current trends indicate that occupational preferences shifting from agriculture to non-agriculture require rural development programs adapted to these changes. The policy implies that it is necessary to create programs in the agricultural sector that provide incentives for agricultural businesses and in the non-agricultural sector that support the existing agricultural sector. Furthermore, there is a need for further research on credit policies and capital assistance for agricultural workers to access agricultural land and run their farming businesses.

References

Amin, M. N., Supardi, S., & Awami, S. N. (2016). Kontribusi tenaga kerja wanita pada usaha emping melinjo terhadap pendapatan keluarga (studi kasus di Desa Sukomangli Kecamatan Reban Kabupaten Batang). *Mediagro*, *12*(2), 28–36.

Amnesi, D. (2013). Analisis faktor-faktor yang berpengaruh terhadap pendapatan perempuan pada keluarga miskin di Kelurahan Kapal Kecamatan Mengwi Kabupaten Badung. *E-Jurnal Ekonomi Dan Bisnis*, *2*(1), 1–21.

Amoak, D., Ishola, T. O., Batung, E., Mohammed, K., Lupafya, E., & Luginaah, I. (2023). Does climate information source matter in smallholder farmers' climate resilience? Comparative insights from Malawi and Ghana. *Environmental Development*, *48*, 100931. https://doi.org/10.1016/j.envdev.2023.100931

Anantanyu, S. (2011). Kelembagaan petani: Peran dan strategi pengembangan kapasitasnya. *SEPA*, *7*(2), 102–109.

Ariska, P. E., & Prayitno, B. (2019). Pengaruh umur, lama kerja, dan pendidikan terhadap pendapatan nelayan di kawasan pantai kenjeran Surabaya tahun 2018. *Economie*, *1*(1), 36–47.

Barrett, C. B., Ghezzi-Kopel, K., Hoddinott, J., Homami, N., Tennant, E., Upton, J., & Wu, T. (2021). A scoping review of the development resilience literature: Theory, methods and evidence. *World Development*, *146*, 105612. https://doi.org/10.1016/j.worlddev.2021.105612

Cafer, A., Green, J., & Goreham, G. (2019). A Community Resilience Framework for community development practitioners building equity and adaptive capacity. *Community Development*, *50*(2), 201–216. https://doi.org/10.1080/15575330.2019.1575442

Cavalleri, S. A. E., Tanwattana, P., & Grünbühel, C. M. (2022). Systemizing a rural livelihood diversification framework for sustainable community-based agritourism: A participatory approach to ensure resilience. *Frontiers in Sustainable Food Systems*, *6*. https://doi.org/10.3389/fsufs.2022.993892

Chambers, R., & Conway, G. (1991). *Sustainable rural livelihoods: practical concepts for the 21st century* (296; IDS Discussion Paper).

Das, C. S. (2021). Livelihood of Forest Dependent Dwellers in Relation to the Exploitation of Resources at the Fringe of Indian Sundarban. In *Mangroves: Ecology, Biodiversity and Management* (pp. 371–399). Springer Singapore. https://doi.org/10.1007/978-981-16-2494-0_16

Fuady, I., Lubis, D. P., & Lumintang, R. W. E. (2015). Perilaku komunikasi petani dalam pencarian informasi pertanian organik (kasus petani bawang merah di Desa Srigading Kabupaten Bantul). *Jurnal Komunikasi Pembangunan*, *10*(2), 10–18.

Islam, Md. A., Biswas, R., Sharmin, A., Dey, T., Ashaduzzaman, Md., & Partho, S. H. (2022). Sustainable livelihoods and household participation in agroforestry: a case study adjacent to the Sundarban reserve forest in Bangladesh. *GeoJournal*, *88*(3), 3059–3078. https://doi.org/10.1007/s10708-022-10796-0

Julianto, D., & Utari, P. A. (2019). Analisa pengaruh tingkat pendidikan terhadap pendapatan individu di Sumatera Barat. *Ikraith Ekonomika*, *2*(1), 122–131.

Kamardiani, D. R., Fauzan, M., & Riansyah, K. S. (2021). The feasibility of environmentally friendly and conventional shallot farming in Bantul Regency. *IOP Conference Series: Earth and Environmental Science*, *883*(1), 012070. https://doi.org/10.1088/1755-1315/883/1/012070

Naeem, S., Bunker, D. E., Hector, A., Loreau, M., & Perrings, C. (2009). *Biodiversity, Ecosystem Functioning, and Human Wellbeing*. Oxford University Press. https://doi.org/10.1093/acprof:oso/9780199547951.001.0001

Nhassengo, O. S. Z., Somura, H., & Wolfe, J. (2021). Environmental flow sustainability in the Lower Limpopo River Basin, Mozambique. *Journal of Hydrology: Regional Studies*, *36*, 100843. https://doi.org/10.1016/j.ejrh.2021.100843

Nugroho, B., Mildaryani, W., & Candra Dewi, D. S. H. (2019). Potensi gulma siam (Chromolaena odorata L.) sebagai bahan kompos untuk pengembangan bawang merah organik. *Jurnal Agronomi Indonesia (Indonesian Journal of Agronomy)*, *47*(2), 180–187. https://doi.org/10.24831/jai.v47i2.23440

Nurhadi, N., Suparmini, S., & Ashari, A. (2018). Strategi penghidupan masyarakat pasca erupsi 2010 kaitannya dengan kesiapsiagaan menghadapi bencana berikutnya. *Majalah Geografi Indonesia*, *32*(1), 59–67. https://doi.org/10.22146/mgi.29129

Perrin, A., Milestad, R., & Martin, G. (2020). Resilience applied to farming: Organic farmers perspectives. *Ecology and Society*, *25*(4), 1–17. https://doi.org/10.5751/ES-11897-250405

Pradhan, P., Callaghan, M., Hu, Y., Dahal, K., Hunecke, C., Reusswig, F., Lotze-Campen, H., & Kropp, J. P. (2023). A systematic review highlights that there are multiple benefits of urban agriculture besides food. *Global Food Security*, *38*, 100700. https://doi.org/10.1016/j.gfs.2023.100700

Puspitawati, H., Putri, A. C. J., Titipani, A., & Khasanah, M. N. (2019). Kontribusi ekonomi perempuan, tekanan ekonomi dan kesejahteraan keluarga pada keluarga nelayan dan buruh tani bawang merah. *Jurnal Ilmu Keluarga Dan Konsumen*, *12*(2), 87–99. https://doi.org/10.24156/jikk.2019.12.2.87

Rosnita, Roza, Y., & Susy, E. (2014). Curahan waktu wanita dan kontribusinya terhadap pendapatan rumah tangga. *Parallela*, *1*(2).

Ruswanty, R., Dangnga, M. S., & Halimah, A. S. (2019). Pengaruh tenaga kerja, modal, dan jarak tempuh melaut terhadap pendapatan nelayan di Kelurahan Pangali-Ali Kecamatan Banggae Kabupaten Majene. *Jurnal Pendidikan Teknologi Pertanian*, *5*, 83–90.

Sconnes, I. (1998). *Sustainable Rural Livelihood: A Frame for Analysis* (72; IDS Working Paper).

Singh, R. K., Hussain, S. M., Riba, T., Singh, A., Padung, E., Rallen, O., Lego, Y. J., & Bhardwaj, A. K. (2018). Classification and management of community forests in Indian Eastern Himalayas: implications on ecosystem services, conservation and livelihoods. *Ecological Processes*, *7*(1), 27. https://doi.org/10.1186/s13717-018-0137-5

Suratiyah, K. (1994). Konsep-konsep kegiatan off-farm. *Jurnal Populasi*, *5*(1).

Susanawati, S. P., & Fauzan, M. (2019). Risk of shallot supply chain: An analytical hierarchy process (AHP) model in Brebes Java, Indonesia. *Int. J Sup. Chain. Mgt*, *8*(1), 124–131. http://excelingtech.co.uk/

Triyono, Fauzan, M., Mu'awanah, J., & Sedek, M. (2021). Production factor efficiency of shallot farming in Pati, Central Java, Indonesia. *E3S Web of Conferences*, *316*, 02036. https://doi.org/10.1051/e3sconf/202131602036

Vebriyanti, D., Antara, M., & Effendy, E. (2018). Analisis komparatif produksi dan pendapatan usahatani bawang merah organik dan nonorganik di Desa Oloboju Kecamatan Sigi Biromaru Kabupaten Sigi. *J. Agroland*, *25*(3), 259–264.

Weldemariam, L. F., Sakdapolrak, P., & Ayanlade, A. (2023). Household food-security strategies and migration in Tigray, Northern Ethiopia. *Scientific African*, *21*, e01801. https://doi.org/10.1016/j.sciaf.2023.e01801

White, B. (1991). *In the shadow of agriculture: economic diversification and agrarian change in Java, 1900-1990* (96; Working Paper Series).

Wood, G., & Gough, I. (2006). A comparative welfare regime approach to global social policy. *World Development*, *34*(10), 1696–1712. https://doi.org/10.1016/j.worlddev.2006.02.001

Wouterse, F. (2016). Can human capital variables be technology changing? An empirical test for rural households in Burkina Faso. *Journal of Productivity Analysis*, *45*(2), 157–172. https://doi.org/10.1007/s11123-015-0457-8