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MARKET BEHAVIOR OF POTATO COMMODITY: A CASE STUDY IN HIGHLANDS OF SOUTH SULAWESI PROVINCE, INDONESIA

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ABSTRACT

Potato (*Solanum tuberosum* L) is one of the significant food commodities with high economic value. The high economic value has an impact on the income of farmers and also on those who carry out marketing activities. Through this position, the government pays special attention to increasing its production. Notwithstanding, there are many problems that arise related to trading system, especially in market behavior. This study was conducted to analyze the trade system, distribution channel and farmer's share of potato commodity in South Sulawesi Indonesia. data were collected from 41 potato farmers through random sampling who living in Gantarang subdistric, Tinggimoncong Distric, Gowa Regency, South Sulawesi province. This location was determined because the village is the largest potato production area in Sulawesi (70 percent). The trader respondents were selected purposively, particularly three intermediary traders, three wholesalers, and 20 retailers from traditional markets. The analysis methods used are qualitative and quantitative methods. The results show that the potato trade in Gantarang Sub-district which control of potato pricing decisions is dominated by intermediary traders, in this case intermediary traders who tend to want high profits and farmers do not have a strong bargaining position. This is characteristic an oligopsony market structure. The distribution channel includes three intermediaries, they are collecting traders, wholesalers, and retailers. The value of farmer's share of potato commodities in both distribution channel I and distribution channel II is in the efficient category.

KEY WORDS

Potato, market behavior, trading system, distribution channel, farmer's share.

One of the pillars of Indonesia's development lies in the agricultural sector. The agricultural sector is a strategic sector that is the main basis of the national economy. Agricultural business activities include: cultivation of food crops, horticulture, plantations, fisheries, forestry, and animal husbandry involve not only farmers but also market players and agricultural policy makers. The development of agriculture therefore needs attention, although industrialization policy priorities have been set, this sector can still have the ability to increase people's income (Rangkuti, 2018; Gordón, 2019; Rozaki, 2021; Harjanto, 2022).

Horticulture (include potato) is a diverse and wide-ranging field, encompassing various aspects such as vegetables, fruits, flowers, lawns, landscape design, and plant conservation. Whether it's a private backyard garden or large-scale agricultural production, horticulture plays an irreplaceable role. It not only provides us with a diverse range of food but also enhances the environment of cities and rural areas, creating harmonious and livable spaces. However, horticulture also faces a series of challenges. The rapid growth of the global



population, climate change, limited land resources, and biodiversity decline pose new demands and challenges to horticulture. In this regard, innovative solutions to encourage horticulture in a more sustainable direction are things that must be pursued (Waaswa et al, 2022; Mason, 2023).

According to the Ministry of Agriculture of the Republic of Indonesia, in 2020 the agricultural sector was able to contribute 2,115,086 billion rupiah or 13.70% of Indonesia's total Gross Domestic Product (GDP) or an increase of 0.9% in 2019 which only contributed 2,012,742 billion rupiah or 12.71% of Indonesia's total Gross Domestic Product (GDP). The increase in the agricultural sector is inseparable from the increase in food crop product commodities which experienced a growth of 10.47%, namely plantations, forestry, fisheries, horticulture, and animal husbandry, each of which has an important function, role, and contribution to the agricultural sector (Nainggolan, 2022). One important food commodity that has high economic value and can increase farmers' income if managed properly is potatoes.

Potato (*Solanum tuberosum L*) is one of the food commodities that is prioritized by the government to increase its production. According to data from the Central Bureau of Statistics (BPS) in 2021, potato production in Indonesia reached 1.36 million tons and the amount increased by 6.10% compared to the previous year of 1.28 million tons (BPS, 2021). The total production of seasonal vegetables and fruits in South Sulawesi Province in 2021 was 602,858.22 tons or an increase of 18.24% from 2020 which only reached 509,874.28 tons. The three commodities that contributed the most to the increase in production of vegetables and fruits in South Sulawesi Province were shallots, potatoes, and leeks, with an increase in production of 58,829 tons, 14,129 tons, and 8,460 tons, respectively. Potato production in 2021 as a whole in South Sulawesi reached 569544 tons. The largest contribution of potato production comes from Gowa Regency (71 percent). This shows that potato production and marketing activities involve many farmers and market players. The contribution of several potato production center districts is presented in figure 1.

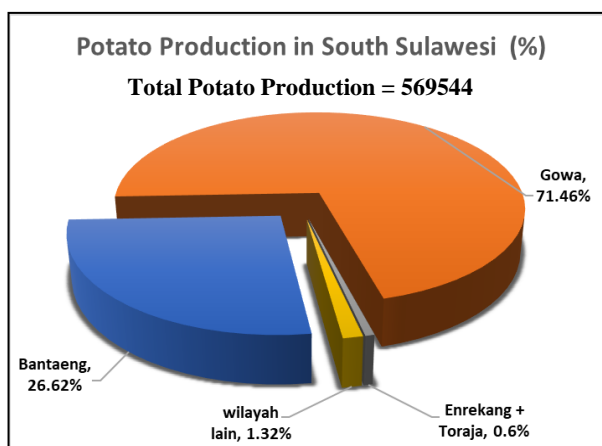


Figure 1 – Potato production by region

The information provided in figure 1 shows that Gowa Regency dominates potato production in South Sulawesi, while Enrekang and Tana Toraja are the region with the least contribution to potato production in 2020 (0.6%). Although all potato-producing regions are highland areas, farmers in the Gowa region count on potatoes as their main crop.

Gowa Regency, especially the Tinggimoncong sub-district, is the highest potato producing area with the prospect of increasing production which is considered very potential with potato production reaching 22,935 tons (Mukarromah et al., 2019). Nevertheless, potato prices often fluctuate, which often has a negative impact on farmers as business actors (Rahmah and Wulandari, 2021). The cause of price fluctuations, apart from pests and diseases, is also because the trading system and marketing functions are not as they should be (Riyadh, 2018; Ginandjar et al., 2020). In addition, problems related to the trading system also include high marketing margins, the risk of perishable fresh agricultural products and



low processing of agricultural products (Asmarantaka et al., 2017; Musfirah et al., 2019; Scott et al., 2019).

The approach is to solve problems in the agricultural product trading system, namely the structure, behavior, and performance of the market, which has the potential to be one of the shapers of potato prices and will be able to determine potato prices and farmers' income. Some of the factors that determine market structure are the number of sellers and buyers, market share, level of technological mastery, elasticity of demand for a product, location, and level of efficiency. Market behavior is an activity carried out in the market that involves marketing functions such as exchange, physical, and facility functions. This market behavior is a pattern of behavior of marketing institutions in a certain market structure which includes buying and selling activities, determining and forming prices, cooperating marketing institutions, and practicing marketing functions. Furthermore, market performance is a measure of achievement obtained from the overall marketing process activities of business actors (Rumallang et al., 2020; Srihono, 2022).

The problems in the potato commodity trading system in Gantarang Village, Tinggimoncong Subdistrict, Gowa Regency, South Sulawesi Province, are: (1) How is the market behavior of potato commodity? (2) How is the distribution channel model of potato commodity? and (3) How much is the farmer's share in the potato commodity trading system? Thus, this study aims to analyze: (1) Potato commodity market behavior, (2) Potato commodity distribution channel model, and (3) Farmer's share in the potato commodity trading system in Gantarang Village, Tinggimoncong District, Gowa Regency, South Sulawesi Province.

METHODS OF RESEARCH

This research was conducted in Gantarang Village, Tinggimoncong Subdistrict, Gowa Regency, South Sulawesi, in March-May 2022. The location was selected purposively, with the considered that the location is a potato producing center.

Data sources are primary and secondary data. Primary data is obtained through interviews with questionnaire guides to potato commodity trading actors, both farmers and traders, including qualitative and quantitative data. Qualitative data is obtained by direct observation of the activities of various institutions involved in the potato commodity distribution channel. Quantitative data includes information on selling prices, buying prices and costs incurred by the various institutions involved. Secondary data in the form of data obtained from literature studies and previous research publications as well as data supporting the potato commodity obtained from the Central Bureau of Statistics (BPS).

The population in this study were all potato farmers in Gantarang Village which amounted to 136 people. Sampling was 30% and selected by simple random so that the number of samples was 41 people. For intermediary traders, the sample was selected purposively. The sample of intermediary traders consisted of 3 intermediary traders, 3 large traders and 20 traditional market retailers.

Qualitative descriptive analysis was used to analyze market behavior related to the activities of trading institutions in channeling potato commodities from farmers as producers to final consumers. The analysis of trading functions can be seen from the exchange function consisting of buying and selling functions, physical functions consisting of transportation and processing functions, and facility functions consisting of standardization, risk bearing, financing and market information. Distribution channel analysis describes the distribution chain that occurs between the point of production to the point of consumption and the trading functions performed by the institutions involved in the distribution channel. These trade flows were used as the basis for drawing a distribution channel model for potato commodities.

Quantitative Analysis is used to calculate Farmer's share which is the price share of production costs incurred by farmers plus the profit they receive (Rahayu et al., 2021). Farmer's share can be calculated using the formula:



$$FS = \frac{Pf}{Pr} \times 100\%$$

Where: FS is share or percentage received by farmers (%), Pf is price at producer level (Rp/Kg), and Pr is price at the consumer level (Rp/Kg).

RESULTS AND DISCUSSION

Market behavior refers to how individuals, consumers, and producers interact within a market. It involves the analysis of purchasing decisions, consumer preferences, marketing strategies, and producer responses to demand and competition. Market behavior encompasses the psychological and economic aspects that influence the interaction between consumers and producers in the market. Therefore market behavior is the behavior of trading institutions that conform to the market structure that is formed (Rumallang et al., 2020; Trinh, 2021).

The market behavior of potatoes in Indonesia may vary depending on several factors, including consumer preferences, market demand, and economic factors. Some aspects that can affect the market behavior of potatoes in Indonesia are consumption and preferences, Market Demand, Production and Supply, Price and Competition, and Government Policy (Masyithoha et al., 2021)

Potato commodity market behavior can be explained by potato pricing practices (Rumallang et al., 2020). In general, the price of potatoes received by farmers ranges from IDR 8,000 to IDR 10,000 per kilo gram, depending on the quality of potatoes in terms of size and variety, but there has been no significant differentiation by trade institutions. Market information possessed by farmers tends to be lower than that possessed by traders, especially on price information, so farmers have low bargaining power and are price takers.

Control of potato pricing decisions is dominated by intermediary traders, in this case intermediary traders who tend to want high profits and farmers do not have a strong bargaining position. Under these conditions, farmers tend to accept low prices as a result of traders trying to maximize their profits (Sheyoputri and Abri, 2021). This concludes that the potato market structure is imperfect competition or oligopsony. In the research location, although the number of traders involved is quite large, the actual activities of these traders are often controlled by certain traders, thus this market concentration will affect market efficiency (Hendra and Hartomo, 2018). This occurs due to the lack of competition among traders as a result of the limited number of traders.

Table 1 – Average margin, purchase and selling price of potatoes in distribution channel 1

Marketing Institution	Distribution Channel 1		
	Purchase Price (Rp/Kg)	Margin (Rp/Kg)	Selling Price (Rp/Kg)
Farmer			8.500
Wholesaler	8.500	1.500	10.000
Retailer	10.000	4.000	14.000
Consumer	14.000		
Total		5.500	

Source: Data Processing, 2022.

Table 2 – Average margin, purchase and selling price of potatoes in distribution channel 2

Marketing Institution	Distribution Channel 2		
	Purchase Price (Rp/Kg)	Margin (Rp/Kg)	Selling Price (Rp/Kg)
Farmer			9.000
Collecting Trader	9.000	1.000	10.000
Retailer	10.000	4.000	14.000
Consumer	14.000		
Total		5.000	

Source: Data Processing, 2022.



To facilitate market, marketing institutions are formed, although these institutions are not in the form of organizations but only in the form of mutual agreements between potato marketing institutions. In terms of payment, traders do not pay cash to farmers, but will pay when the potatoes purchased from farmers have been purchased by the next trader. According to Riyadh's study (2018), the price agreed by the seller and buyer is the result of bargaining and the payment method is based on an agreement in cash or installments. Through this mechanism, farmers receive payment from traders within one week for Makassar and three weeks for inter-island. The behavior of a trader who delays payment or even does not pay becomes an evaluation of the trader's existence and will then be given a social sanction by the farmers in the form of an agreement not to sell their potato production to the trader. This situation can be seen as a social sanction as well as an economic sanction.

The distribution of potato commodities from farmers to consumers is through an indirect marketing system because there are three intermediary traders, namely collecting traders, wholesalers and retailers. This is in line with the results of the study by Hasanuddin et al. (2021) which shows that intermediary traders go directly to farmers' locations to buy potato commodities, so that farmers spend less on marketing costs and directly affect farmers' income levels. Marketing institutions have separate activities and are directly involved in marketing activities (Muniroh et al., 2022). Thus, the ownership of profits from these activities is also separate between farmers and intermediary traders.

The distribution channel for potato commodities in Gantarang Village consists of two distribution channels, which are:

- The first distribution channel model, where farmers sell potato commodities to large traders, then large traders sell them to retailers and retailers sell to consumers. In this distribution channel, there are two main markets: Sungguminasa market in Gowa Regency and Pasar Terong in Makassar City;
- The second distribution channel model, where farmers sell potato commodities to intermediary traders, then intermediary traders to retailers and then retailers to consumers. In this distribution channel, there are intermediary traders who distribute to Makassar City and Kalimantan Island.

The level of marketing margin is determined by the marketing functions performed by marketing institutions. As producers, potato farmers only perform the selling function, while traders perform the exchange function, namely the buying function and the selling function. This is done by purchasing from farmers at a higher level and selling to traders. Furthermore, the facility function is carried out by all traders, which is sorting and transportation, while storage is only carried out by retailers. The packaging function is also carried out by all traders except large traders.

The marketing margin consists of profit as a reward for activities undertaken and the operational costs of marketing, namely transportation/transportation costs, loading and unloading, market tariff/retribution costs, and depreciation costs. The number of marketing margin components is determined by the range of distribution channels traveled. The distribution channel used to calculate the margin value starts from the farmer level, collectors, wholesalers, and retailers in the public market (Mulyaningsih et al., 2022). Potato commodity marketing margins are presented in Table 1 and Table 2.

Marketing margins are not only determined by the number of marketing institutions involved but also by the activities of each institution. This can be seen in the research locations where both distribution channels involve the same number of institutions, but provide different marketing margins. Some examples can be shown for coffee, bananas, and vegetables in Africa (Degaga, 2020; Mukaila et al., 2021).

Table 1 and Table 2 show that despite the same number of marketing institutions involved, the marketing margins generated in each distribution channel are different. Marketing margin analysis is carried out to determine the level of margin obtained by each market actor in distribution activities (Fatmawati and Zulham, 2019) which aims to determine each marketing institution's margin consisting of costs and profits (Sheyoputri and Abri, 2021). Transportation cost is the cost incurred by traders to transport commodities from the



storage market to the retail market. Loading and unloading costs are costs incurred by traders to hire casual labor when loading and unloading potatoes at the point of sale. Market contribution fee is the cost incurred by retailers for cleaning fees and daily space rental (Rajab, 2020). Depreciation costs are the nature of horticultural commodities, including potatoes (Fauzi, 2018). In addition to the perishable nature of potatoes, shrinkage occurs as a result of poor handling and packaging during transportation from storage to retail markets, as well as weight loss and unsold products. Most of these costs are borne by intermediary traders, especially retailers, so it is understandable that the largest margins are at the retailer.

The information obtained from Table 1, Table 2, and the results of the in-depth interviews in this study provide an understanding that the marketing margin does not solely lie in the number of marketing institutions involved, but in what type of financing is issued by each marketing institution.

The concept of farmer's share refers to the portion of the final retail price of an agricultural product that goes to the farmer or producer who grows or cultivates the product (Rahayu et al., 2021). It represents the income or earnings that the farmer receives from selling their produce after deducting the costs associated with production, such as labor, inputs, and other expenses (Hoque et al., 2018). This concept is often used to highlight the disparity between the price consumers pay for agricultural products and the amount that farmers receive. It is used to emphasize the challenges faced by farmers in earning a fair income and the potential imbalances in the supply chain. In the application of the calculation, farmer's share is the percentage ratio between the price share received by farmers and the final consumer price level.

The results of this study indicate that in distribution channel I, the price of potato commodities at the farm level is IDR 8,000/Kg while the price at the consumer level is IDR 14,000/Kg, so that the farmer's share value is 57.14%, while in distribution channel II, the price at the farm level is IDR 9,000/Kg and the price at the consumer level is IDR 14,000/Kg with a farmer's share value of 64.28%.

Theoretically, marketing efficiency indicators can be known from the value of Farmer's share $\geq 40\%$ is efficient, while farmer's share $< 40\%$ is inefficient (Iswahyudi and Sustiyana, 2019; Ardillah and Hasan, 2020). This study shows that the value of farmer's share of potato commodity in distribution channel 1 and distribution channel 2 is 57.14% and 64.28% respectively. Referring to the theoretical postulates, it appears that both distribution channels 1 and 2 are classified as efficient.

CONCLUSION

The market behavior of potato commodities in Gantarang Village, Tinggimoncong Subdistrict, Gowa Regency, South Sulawesi Province, forms an oligopsony market structure due to the lack of competition among a limited number of traders. Pricing is controlled by intermediary traders and farmers lack a strong bargaining position. The potato commodity distribution channel model is an indirect channel model and involves three intermediary institutions, namely intermediary traders, wholesalers and retailers. The farmer's share value obtained is in the efficient category.

REFERENCES

1. Ardillah, F., Hasan, F. (2020). Saluran, margin, and efisiensi pemasaran bebek pedaging di Kecamatan Burneh Kabupaten Bangkalan. *Agriscience* 1(1): 12-25.
2. Asmarantaka, R.W., Atmakusuma, J., Muflikh, Y.N., Rosiana, N. (2017). Konsep Pemasaran Agribisnis: Pendekatan Ekonomi and Manajemen. *Jurnal Agribisnis Indonesia* 5(2): 143-164.
3. Central Bureau of Statistics (BPS). (2021). Statistik Tanaman Hortikultura Provinsi Sulawesi Selatan 2021. Badan Pusat Statistik Provinsi Sulawesi Selatan.



4. Degaga, J. (2020). Review on coffee production and marketing in Ethiopia. *Journal of Marketing and Consumer Research*, 67, 7-15.
5. Fatmawati, F., Zulham, Z. (2019). Analisis margin and efisiensi saluran pemasaran petani jagung (*Zea mays*) di Desa Suka Makmur Kabupaten Pohuwato Provinsi Gorontalo. *Gorontalo Agriculture Technology Journal* 2(1): 19.
6. Fauzi, D. (2018). Analisis tingkat keuntungan petani kentang merah di Kabupaten Solok. *Menara Ilmu* 12(9). [Preprint]. INA-Rxiv. <https://doi.org/10.31227/osf.io/ea7pz>
7. Ginandjar, S., Rahmadi, A., Abdulhakim, M. T., & Subandi, M. (2020). Economic Analysis of Potato Seed in West Java, Indonesia. *Asian Journal of Agriculture and Rural Development*, 10(4), 756-763.
8. Gordón, I.G. (2019). A sectoral growth-income inequality nexus in Indonesia. *Regional Science Policy and Practice*, 11(1), 123-139.
9. Harjanto, P. (2022). Institutional development of farmers through agricultural area-based corporations in Indonesia. *IOP Conference Series: Earth and Environmental Science*, 1114(1).
10. Hasanuddin, A., Said, M., Ruslan, M. (2021). Pengaruh saluran distribusi, biaya pemasaran and volume penjualan terhadap pendapatan petani kentang di Kabupaten Gowa Sulawesi Selatan. *Indonesian Journal of Business and Management* 3(1): 1–10.
11. Hendra, S.T.N., Hartomo, D.D. (2018). Pengaruh konsentrasi and pangsa pasar terhadap pengambilan resiko bank. *Jurnal Bisnis and Manajemen* 17(2): 35.
12. Hoque, F., Afrin, S., Dewan, B., Akter, A., & Nazim, T. B. (2018). An analysis of farmer's share in consumer's price and BCR (benefit cost ratio) for some selected vegetables in Dhaka district of Bangladesh. *International Journal of Economics, Commerce and Management*, 6(12), 620-632.
13. Mason, Jim (2023). *The Future of Horticulture*. International Journal of Horticulture, ISSN 1927-5803, Sophia Publishing Group, Inc.
14. Masyithoha, S. R., Relawatia, R., & Ningsiha, G. M. (2021). Struktur Pasar Komoditas Kentang Asal Batu di Malang Raya. *Jurnal Agribisnis Lahan Kering*, 6(3), 114-120.
15. Mukaila, R., Obetta, A. E., Awoyelu, F. E., Chiemela, C. J., & Ugwu, A. O. (2021). Marketing analysis of vegetables: the case of carrot and cucumber marketing in Enugu State, Nigeria. *Turkish Journal of Agriculture-Food Science and Technology*, 9(2), 346-351.
16. Mukarromah, A.A., Anna, F., Netti, T. (2019). Efisiensi teknis usahatani kentang di Kabupaten Gowa Sulawesi Selatan. *MT - Economic and Management*.
17. Mulyaningsih, S., Cahrial, E., Nuryati, R. (2022). Pemasaran cabai rawit varietas Ori 212 dari Desa Cibeureum Kecamatan Sukamantri Kabupaten Ciamis sampai Pasar Caringin Kota Bandung. *Jurnal Agristan*, 4(2): 114–135.
18. Muniroh, P.R.A. (2022). Analisis efisiensi pemasaran kentang di Kecamatan Getasan Kabupaten Semarang. *Jurnal Ilmu-ilmu Pertanian*, 18(2): 123-135.
19. Musfirah, A., Remmang, H., Idris, M. (2019). Penerapan marketing mix terhadap pengolahan usaha tani hortikultura di Kabupaten Enrekang. *Jurnal Ecosystem*, 19(2): 195-205.
20. Nainggolan, S., Yanita, M., & Yumanita, S. (2022). Analisis Daya Saing Usahatani Kentang and Dampak Kebijakan Pemerintah Di Provinsi Jambi-Indonesia. *Journal of Agribusiness and Local Wisdom*, 5(1), 104-115.
21. Rahayu, H. S. P., Dewi, M., & Abid, M. (2021). Analysis of Marketing Margins and Farmers' Shares on Corn in Sigi Regency, Central Sulawesi, Indonesia. *Caraka Tani: Journal of Sustainable Agriculture*, 36(2), 355-364.
22. Rahmah, S.A., Wulandari, E. (2020). Keragaman produksi and harga kentang di Kecamatan Pangalengan, Kabupaten Bandung. *Mimbar Agribisnis: Jurnal Pemikiran Masyarakat Ilmiah Berwawasan Agribisnis*, 6(1): 265.
23. Rajab, A. (2020). Kontribusi retribusi pasar terhadap pendapatan asli daerah di Kabupaten Mamuju. *Jurnal Ilmiah Ekonomi Pembangunan*, 1(2): 149-156.



24. Rangkuti, S. (2018). Pengaruh penggunaan pupuk hayati cair terhadap peningkatan produksi and pendapatan usahatani padi di Desa Lampoh Tarom Kecamatan Kuta Baro Kabupaten Aceh Besar. *Jurnal Ilmiah Mahasiswa Pertanian Unsyiah*, 3(1): 155-166.
25. Riyadh, M.I. (2018). Analisis saluran pemasaran lima pangan pokok and penting dilima Kabupaten Sumatera Utara. *Jurnal Ekonomi & Kebijakan Publik*, 9(2): 161 - 171.
26. Rozaki, Z. (2021). Food security challenges and opportunities in indonesia post COVID-19. *Advances in Food Security and Sustainability*, 6, 119-168, ISSN 2452-2635.
27. Rumallang, A., Jumiati, J., Akbar, A., Nandir, N. (2020). Analisis struktur, perilaku and kinerja pemasaran kentang di Desa Erelembang Kecamatan Tombolopao Kabupaten Gowa. *Agrikultura*, 30(3): 83.
28. Scott, G. J., Petsakos, A., & Juarez, H. (2019). Climate change, food security, and future scenarios for potato production in India to 2030. *Food security*, 11, 43-56.
29. Sheyoputri, A.C.A., Abri, A. (2021). Analisis struktur pasar sayuran di Desa Kanreapia Kecamatan Tinggimoncong Kabupaten Gowa Provinsi Sulawesi Selatan. *Jurnal Ilmiah Ecosystem*, 21(3): 634–643.
30. Srihono, A. (2022). Dampak efektivitas rantai distribusi perdagangan bagi peningkatan daya saing daerah (Studi pada pengaturan distribusi perdagangan kopi di Kabupaten Jombang). *Journal of Regional Economics Indonesia*, 3(1): 73–88.
31. Trinh, T. H. (2021). The extended insights into market behavior. In *Eurasian Business and Economics Perspectives: Proceedings of the 30th Eurasia Business and Economics Society Conference* (pp. 225-238). Springer International Publishing.
32. Waaswa, A., Oywaya Nkurumwa, A., Mwangi Kibe, A., & Ngeno Kipkemoi, J. (2022). Climate-Smart agriculture and potato production in Kenya: review of the determinants of practice. *Climate and Development*, 14(1), 75-90.