

Women's Role in Fish Processing for Business Sustainability at Depok Beach

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Abstract. This study explores the role of women in fish processing at Depok Beach, Bantul Regency, and its impact on the long-term sustainability of local fishing businesses. The aim is to assess how women's involvement influences business survival and growth in the fishing sector. The research, conducted between May and June 2024, involved 72 women engaged in fish processing, using observation, interviews, and documentation techniques for data collection. The results indicate that women's participation significantly supports the local economy by maintaining traditional fish processing methods that meet market standards, promoting resource and waste management, and enhancing community participation. However, challenges such as financial limitations and lack of technological access limit their ability to innovate and expand. These gaps highlight the need for policy changes and increased support for women in the sector. The study concludes that empowering women is essential for the sustainability of fish processing businesses in Bantul Regency, and recommends investing in capacity-building programs to overcome barriers and maximize their potential. The findings provide actionable insights for policymakers and stakeholders to foster sustainable coastal development. **Keywords:** coastal women, economic impact, fish processing, role of women, sustainability.

1 Introduction

One of the potentials developed in coastal areas is fish processing. *Fish* is a fishery commodity that only lasts for a short time (perishable) and undergoes a swift decay process. Therefore, efforts are needed to maintain the quality of fish. On the other hand, fish is a high protein source, so fish processing is an alternative food source. Processing is an effort to overcome these problems. Through processing, fish quality can be maintained for a long time, has added value, and is still famous for consumption. [1] explained that traditional fish processing methods are more dominant than modern processing methods, so it can be said that the percentage of traditional fish processing is always high compared to modern methods. According to BI [2], there are 25,602 micro-scale fish processing businesses, 37,464 small-scale fish processing businesses, and 650 medium-scale fish processing

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businesses. Traditional fish processing is at the micro and small business level or in the home industry realm. This refers to the statement of Fatchiya[1] that traditionally processed fish or cured fish is a product that is processed and is generally carried out on a home industry scale. Traditional fish processing is at the micro and small business level, which can be seen from the characteristics based on the number of employees of less than 30 people. The location and commodities being cultivated are fixed. However, the quality still needs to be standard, and financial administration is still being carried out [1]

As part of the fishery community, women fishery product processors can also work in public spaces and significantly contribute to increasing household income. Suitable work for women processors to help provide additional income for their families is related to increasing their knowledge and skills, for example, through guidance, training, courses, and briefings, where these activities do not interfere with their role as household managers [3] Traditional fish processing at the micro and small business level still has many obstacles. According to Zamroni and Purnomo [4] small and medium businesses generally need help developing their businesses, such as limited access to technology, markets, and raw materials, which, if traced, all come from limited business capital. Natalia [6] said that obstacles in developing fish processing businesses are due to weak quality assurance, high levels of loss, lack of promotion intensity, limited fish handling facilities, lack of or no standardization of raw materials, limited technological information, uncertainty in prices and production, triggered by fluctuations in market demand, uncertain climate factors, and limited infrastructure and distribution of fish production results. Deswati & Hikmah [6] obstacles and problems experienced in fish processing businesses in Pacitan are that raw material stocks are less guaranteed, and it isn't easy to find market destinations.

These difficulties result in the vulnerability of livelihood capital for women fish processors. Livelihood capital consists of natural capital in the form of the availability of raw fish materials, which is also an essential factor. However, it is often influenced by weather and seasonal conditions. Physical capital, such as adequate processing equipment and access to other supporting facilities, supports productivity. Social capital, consisting of social networks and cooperation between fish processors, strengthens their position in facing economic challenges. Finally, financial capital, which includes access to business capital and financial management, shows that limited business capital is one of the main obstacles faced. This study provides an in-depth understanding of women fish processors' livelihood capital dynamics. It proposes several recommendations to improve their welfare, such as providing skills training, increasing access to capital, and developing supporting infrastructure. The approach used in analyzing the strategies implemented by fish farmers to keep their businesses running is the Sustainable Livelihood Approach (SLA). Allison and Ellis [7] argue that the concept of livelihood can reconcile essential factors that influence the vulnerability (problems) and strength of individual or family survival strategies. Therefore, the livelihood sustainability approach is critical to study to provide an overview of the vulnerability or livelihood capital problems faced by women fish processors in Pantai Depok, Bantul Regency, Yogyakarta, and ideas that can be attempted to overcome these vulnerabilities. Based on the livelihood capital they have. Based on the identification of the problem, this study aims to determine the women's roles in fisheries livelihood

2 Materials and Methods

This research was conducted at Depok Beach, D.I Yogyakarta, from May to June 2024. This location was chosen because Depok Beach is a coastal tourism area in Yogyakarta with a

fish market and culinary and souvenirs made from fish catches. The UMKM actors, seafood stalls, and raw fish snacks around and along Depok Beach are dominated by women.

The unit of analysis used in this study was the household of female fish processors. The sample of respondents was 72 people, and the survey was conducted using simple random sampling. Primary data were collected through interviews, observations, and documentation. Primary data, such as the identity of female fish processor households (namely name, age, and level of education), availability and access to capital for the livelihood of female fish processor households, and the activities of female fish processor households, were collected. Secondary data were also collected through literature studies and data collection at the Bantul Regency Fisheries and Marine Service. The data were analyzed based on four critical components included in the questionnaire, such as the profile of female fish processors, ownership, and access to each capital (natural, physical, financial, human, and social) adapted from the research of Nissa et al. [8]

Furthermore, it was enriched with analyzing problems or challenges and survival strategies applied by female fish processor households utilizing their livelihood capital. The data results are presented as descriptive statistics in tabulations averaged and grouped according to existing groups or levels according to the final results. In addition, several photo and proxy approaches are used to support the results.

3 Results and Discussion

3.1 Socio-economic characteristics of women fish processors in Depok Beach, Yogyakarta

Age variable shows that most women involved in the fish processing business in Depok Beach are between 30-50 years old, with a percentage of 54.16%. According to Febianti et al.[9], 30-50 years is a productive age, so the respondents have high productivity in working or running their businesses. Productive age workers tend to have stronger physiques than non-productive age workers. Furthermore, Febianti et al.[9], explained that the higher a person's level of education, the higher the person's productivity or performance. The education level variable shows that most female fish processing business actors on Depok Beach have graduated from high school, with a percentage of 36.12%. These results show that the higher the education of female fish processors, the more significant their role in helping the family economy. Education also influences their creativity and productivity in business development[10-11]

The variable of the number of family members of female fish processing respondents at Depok Beach shows the number of family members as many as 3-5 people with a percentage of 81.94% and an average of 3 people. It can be interpreted that the more family members there are, the more significant the role of female fish processors in Depok Beach with the increasing number of family members. The number of family members and their composition affect the amount of time spent working at home to earn a higher income to meet the increasing needs of the family [12]More profound, the fish processing experience variable shows that most female fish processors in Depok Beach have more than ten years of experience, 59.72%. Female fish processors already have long experience or work experience in processing fish. If someone works longer on a job that suits their skills, their productivity is expected to increase. Work experience increases work productivity positively[13]

Table 1. Socio-economic characteristics of the respondents

| Variable characteristic | Frequency | Percentage | Mean |
|--------------------------------------|------------------|-------------------|--------------------------|
| Age structure | | | |
| <30 years old | 0 | 0 | |
| 30 - 50 years old | 39 | 54,16 | 49,75 |
| >50 years old | 33 | 45,83 | |
| Education Background | | | |
| Elementary School | 22 | 30,55 | |
| Junior High School | 23 | 31,94 | |
| Senior High School | 26 | 36,12 | Senior High School |
| Diploma/Bachelor | 1 | 1,38 | |
| Household member | | | |
| 1 – 2 person | 13 | 18,05 | |
| 3 – 5 person | 59 | 81,94 | 3 |
| Experience in fish processing | | | |
| < 5 years | 16 | 22,22 | |
| 5 – 10 years | 13 | 18,06 | 13,89 |
| >10 years | 43 | 59,72 | |
| Mean of Income | | | |
| <2 million | 64 | 88,88 | |
| 2 – 5 million | 6 | 8,33 | 1.861.069 |
| >5 million | 2 | 2,78 | |

The average data results of the female fish processor income variable are less than 2 million, with a percentage of 88.88%. The average value is the income of female fish processors per month on Depok Beach. The income obtained is uncertain per day or month, which aligns with the research results of Saleh et al. [14] The income of fish processors varies depending on the wind season because the sea waves are calmer in the east wind season so that fishermen can catch fish more efficiently, and the supply of fish to be processed increases. Meanwhile, in the west wind season, the more choppy sea conditions make it difficult for fishermen to go to sea, reducing fish processors' income.

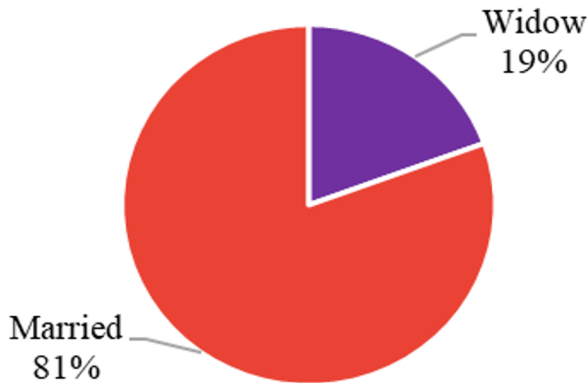


Fig 1 . Respondents

Based on Figure 1, the Marital status of the respondents shows that most female fish processing respondents are married. This can be interpreted that empowering homemakers has a significant social impact. The role of women in the family economy through fish processing not only increases family income but also strengthens the values of gender equality. The involvement of women in economic activities can support women in getting the opportunity to contribute more to improving family welfare. In addition, additional income from homemakers' businesses can improve the quality of family life, such as education and child welfare [15-16]

3.2 Livelihood Analysis of the Women Fish Processors

The analysis of Figure 2 illustrates the varying levels of access to and utilization of livelihood capital among women fish processors in Depok Beach, Yogyakarta. The highest indices are observed in natural and human capital, indicating their significant reliance on fish resources and the skills these women possess in fish processing. Natural capital, with the highest index of 2.35, underscores the dependency of women fish processors on the availability of natural resources, mainly fish. This dependency is well-founded, as capture fisheries production in Bantul Regency has shown a stable and increasing trend over recent years. In 2019, the capture fisheries production was recorded at 450 tons, which increased to 460 tons in 2020 and 490 tons in 2021 [17] This upward trend in fish availability is crucial for sustaining the livelihood activities of these women. A steady supply of fish in this area is crucial for maintaining their fish processing activities. According to Puspitawati et al.[18], well-managed and stable natural resources play a significant role in enhancing the economic

resilience of coastal communities. Human capital is followed by an index of 2.04, reflecting women's adequate skills in fish processing, supported by their knowledge and experience. These skills are vital assets that enable them to innovate and add value to their fish products.

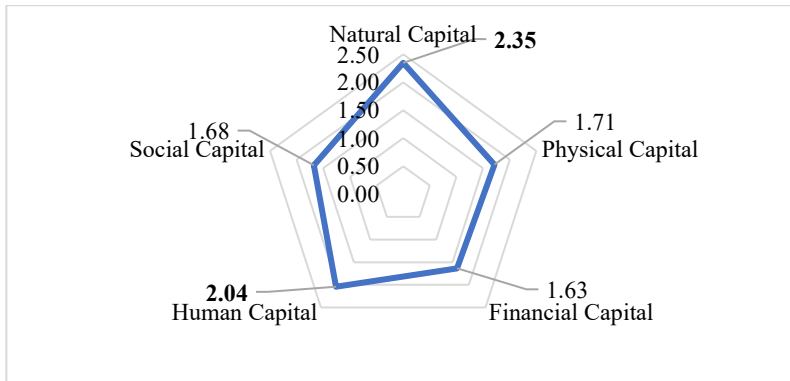


Fig 2. Utilization and access to Livelihood Capital for women fish processors in Depok Beach, Yogyakarta

Notably, 36% of these women have a high school education, and most are within the economically productive age range. This demographic factor contributes to the high value of human capital, as their education and age enhance their capacity to acquire and apply new skills effectively. Note that skills and knowledge are critical factors in improving the competitiveness and sustainability of micro, small, and medium enterprises (MSMEs) [19] Social capital, with an index of 1.68, suggests that social networks and cooperation among business actors play a moderately important role in supporting their economic activities. However, there is still room to strengthen these networks to enhance access to information, markets, and broader financial resources. Physical capital (1.71) and financial capital (1.63) indicate that women fish processors face limitations in accessing physical infrastructure and financial resources. Limited access to financial capital can restrict their ability to invest in more modern equipment or technology, which could improve efficiency and product quality. Diana [20] reveals that limited financial capital is one of the main obstacles small-scale entrepreneurs face in fisheries.

3.3 The Role of Women Fish Processors in the economic household

The low level of female employment in several countries is related to traditional perceptions of women's roles, where they still bear the main burden of housework and childcare. This unequal division of responsibilities encourages women to balance public and private life, which impacts their careers [21] In line with that, Dolan & Stancanelli [22] stated that the equality of the roles of women and men still has a large gap when viewed from women's wages, which remain far below men's wages. However, in contrast, data in the field states that most of the husbands of female fish processors in Depok Beach work in the agricultural and labor sectors; this shows a close relationship between economic activities in the area and the agricultural and fisheries sectors. The role of women as fish processors is quite significant in the household economy, mainly because their husbands' jobs tend to be in sectors with

uncertain or seasonal incomes, namely farming or becoming laborers, as explained in Figure 3.

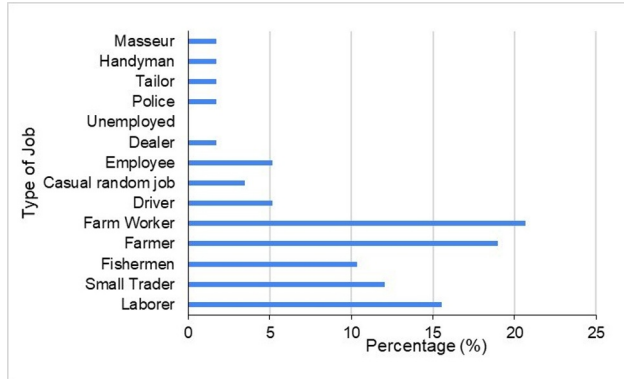


Fig 3. Main Job of Husband of Woman Fish Processor on Depok Beach, Yogyakarta

Figure 3 shows that the main jobs of the husbands of women fish processors are most dominant as farmers and farm worker, which contribute around 20% and 25% of the total employment, respectively. Other significant jobs are farm worker and traders, with a percentage of around 10% to 15%. Meanwhile, jobs such as drivers, laborers, employees, and small traders have a lower rate, ranging from 5% to 10%. Meanwhile, jobs such as drivers, laborers, employees, and small traders have a lower rate, ranging from 5% to 10%. Jobs such as laborers, masseurs, tailors, police, and those unemployed have a tiny percentage, less than 5%. Therefore, income from fish processing carried out by these women can be an essential additional source of income for the sustainability of their family's economy. The involvement of women in fish processing also reflects the dependence of the household economy on the fisheries sector in Depok Beach, where both men and women have significant roles in supporting the family economy. In line with that, women's involvement in the world of work has contributed to changing mindsets and significantly to the economic welfare of families, especially in the financial sector. Working women can increase family income and help improve the family's quality of life [23]

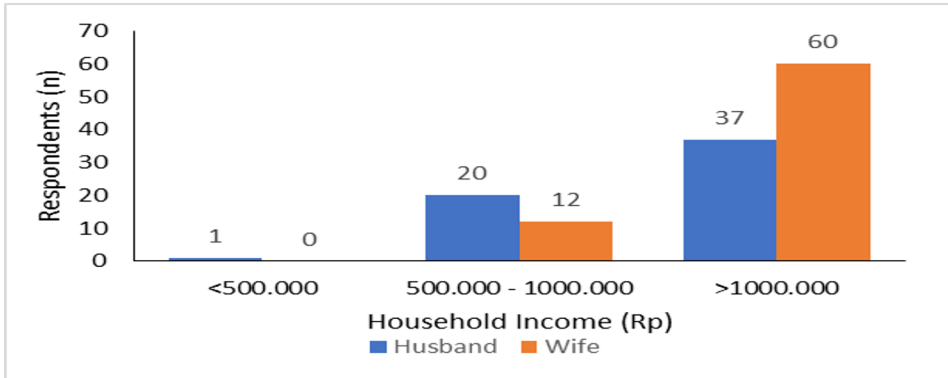


Fig 4. Household Income Sources for Female Fish Processors on Depok Beach, Yogyakarta

The average income of wives is IDR 1,861,069, higher than that of husbands, IDR 1,652,632. Husbands' incomes vary, ranging from IDR 300,000 to IDR 5,000,000, while wives' incomes range from IDR 1,000,000 to IDR 15,000,000. The income comparison between husbands and wives in this household shows a ratio of 1:3, where wives contribute more to family finances than husbands, in line with Yare's research[24], which shows that the role of women in the household impacts their efforts to increase family income. Women's contributions through this additional work support the family economy. Not only does it help increase husbands' incomes, but it also significantly contributes to improving the family's overall welfare.

4 Conclusions and Suggestion

The involvement of women in fish processing contributes to business sustainability through various processes. Firstly, their participation helps preserve traditional processing methods that ensure fish quality and meet market standards. Secondly, women's resource and waste management expertise promotes more environmentally friendly practices. Their involvement in decision-making also strengthens community engagement and resilience, contributing to a more robust local economy. However, the study notes that women face financial and technological barriers that limit their ability to innovate and grow. Therefore, appropriate legislation and support are essential to fully realizing women's potential in sustainable business practices. The research concludes that women play a vital role in the seafood processing industry at Depok Beach and provides policymakers and stakeholders with practical recommendations for promoting sustainable coastal development. In order to safeguard the fish processing industry in Bantul Regency, the report recommends investing in women's empowerment and capacity building.

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References

- [1] Fatchiya A., Amanah S., and Sadewo T., "Faktor-Faktor Yang Memengaruhi Kemampuan Pengolah Ikan Tradisional Di Kabupaten Cirebon," *J Sos Ekon Kelaut dan Perikan*, vol. 14, no. 2, pp. 239, 2019.
- [2] Bank Indonesia, "Profil Bisnis Usaha Mikro, Kecil Dan Menengah (UMKM)," *Bank Indonesia dan LPPI*, 2015, pp. 1–135.
- [3] Poerwati T., Witjaksono A., Soewarni I., and Masrurroh U., "Bentuk Partisipasi Perempuan Nelayan Terhadap Pemanfaatan Ruang," *J Penataan Ruang*, vol. 13, no. 1, pp. 6, 2018.
- [4] Zamroni and Purnomo, "Identifikasi kebutuhan modal usaha," *Identifikasi Kebutuhan Modal Usaha Berskala Kecil Dan Menengah Dalam Ind Pengolah Perikan*, vol. 11, no. 3, pp. 41–50, 2005.
- [5] Natalia D., "Kinerja Daya Saing Produk Perikanan Indonesia Di Pasar Global," *Bul Ilm Litbang Perdagangan*, vol. 6, no. 1, 2012.
- [6] Deswati RH and Hikmah, "Keragaan Penerapan Teknologi Dan Kelayakan Usaha Performance of Technology Application and Feasibility of Tuna Fish Processing in The District Pacitan," *Bul Ilm Mar Sos Ekon Perikan dan Kelaut*, vol. 2, no. 1, pp. 29–35, 2016.
- [7] Allison EH and Ellis F., "The livelihoods approach and management of small-scale fisheries," *Mar Policy*, vol. 25, no. 5, pp. 377–88, 2001.
- [8] Nissa ZNA, Suadi, and Sukardi S., "Livelihood analysis of floating net cages fish farmers at Sendang Village Sub-district of Gajah Mungkur Reservoir of Wonogiri Regency," *IOP Conf Ser Earth Environ Sci*, vol. 139, no. 1, 2018.
- [9] Febianti A., Shulthoni M., Masrur M., and Aris Safi M., "Pengaruh Tingkat Pendidikan, umur, jenis kelamin, dan Pengalaman Kerja Terhadap Produktivitas Kerja di Indonesia," *J Sahmiyya*, vol. 2, no. 1, pp. 198–204, 2023. Available: <https://ejournal.uingusdur.ac.id/sahmiyya/article/view/892>.
- [10] Syahputra A., "Ekonomi Perempuan Pesisir Gampong Ujong Blang mengetahui keadaan keluar masuknya uang dalam sebuah keluarga," *Dalam keselamatan hidup (safety life)/bertahan hidup, dengan mempertaruhkan*, vol. 3, no. 1, pp. 1–22, 2021. Available: <https://journal.iainlhokseumawe.ac.id/index.php/saree/article/download/562/378/3291>.
- [11] Homayoun S. and Henriksen D., "Creativity in Business Education: A Review of Creative Self-Belief Theories and Arts-Based Methods," *J Open Innov Technol Mark Complex*, vol. 4, no. 4, pp. 55, 2018. Available: <https://doi.org/10.3390/joitmc4040055>.
- [12] Sulasni P. and Suwendra IW., "The Influence of Income and Number of Family Members on the Welfare of Farming Families in Gerokgak Village, Gerokgak District," *J Akunt Profesi*, vol. 12, no. 2, pp. 506, 2021. Available: <https://ejournal.undiksha.ac.id/index.php/JAP/article/view/33239>.

- [13] Maranto CL. and Rodgers RC., "Does Work Experience Increase Productivity? A Test of the On-The-Job Training Hypothesis," *J Hum Resour*, vol. 19, no. 3, pp. 341, 1984. Available: <https://www.jstor.org/stable/145877?origin=crossref>.
- [14] Saleh Y., Riantini M., Lestari D., and Nur'aini G., "Analisis Komparatif Pendapatan Pengolah Ikan Teri Asin di Pulau Pasaran Kota Bandar Lampung," *J Ext Dev ISSN*, vol. 4, no. 3, pp. 144–50, 2022. Available: <https://jsp.fp.unila.ac.id/index.php/jsp/article/view/128/71>.
- [15] Rahmadi AN., Suchayo I., Septiandi V., Supriyanto S., and Mubarak H., "Pemberdayaan Ibu Rumah Tangga dalam Membuka Peluang Usaha Baru Guna Meningkatkan Perekonomian," *J Pengabdian ...*, vol. 4, no. 3, pp. 2630–5, 2023. Available: <http://ejournal.sisfokomtek.org/index.php/jpkm/article/view/1588>.
- [16] Nugroho L., Hidayah N., Ali AJ., and Badawi A., "E-Commerce to Improve Homemaker Productivity (Women Entrepreneur Empowerment at Meruya Utara, Kembangan District, West Jakarta, Indonesia)," *Amalee Indones J Community Res Engagem*, vol. 1, no. 1, pp. 13–24, 2020. Available: <https://ejournal.insuriponorogo.ac.id/index.php/amalee/article/view/166>.
- [17] BPS Provinsi D.I. Yogyakarta, "Produksi Perikanan Tangkap Kabupaten/Kota dan Jenis Penangkapan di Provinsi DI Yogyakarta," 2024.
- [18] Puspitawati D., Fadli M., Moelyadi M., Kusumaningrum A., Supriyadi S., Wardani MP., et al., "Analysis of Community Social Economic Resilience Based on Coastal and Marine Natural Resources," *Econ Soc Fish Mar J*, vol. 010, no. 01, pp. 41–54, Oct. 2022. Available: <https://ecsofim.uib.ac.id/index.php/ecsofim/article/view/1996>.
- [19] Wulandari YS., Abadi S., Zahra FA., and Syahputra AF., "Peningkatan pengetahuan dan keterampilan pelaku UMKM perikanan melalui sosialisasi manajemen dan pemasaran," *J Inov Has Pengabdian Masy*, vol. 6, no. 2, pp. 257–68, May 2023. Available: <http://riset.unisma.ac.id/index.php/jipemas/article/view/19385>.
- [20] Diana R., "Analisis Aksesibilitas Permodalan Usaha Mikro Kecil di Provinsi Sumatera Barat," *J Ekon Pembang*, vol. 27, no. 1, pp. 67–80, Oct. 2019. Available: <https://jurnalekonomi.lipi.go.id/JEP/article/view/299>.
- [21] Mussida C. and Patimo R., "Women's Family Care Responsibilities, Employment and Health: A Tale of Two Countries," *J Fam Econ Issues*, vol. 42, no. 3, pp. 489–507, Sept. 2021. Available: <https://doi.org/10.1007/s10834-020-09742-4>.
- [22] Dolan E. and Stancaelli E., "Women's Employment, Wages, and the Household," *J Fam Econ Issues*, vol. 42, no. S1, pp. 101–6, Jul. 2021. Available: <https://doi.org/10.1007/s10834-020-09744-2>.
- [23] Zuhri A., Laily Wulandari N., Purnomo A., and Budiyono F., "The Role of Women in Improving Household Economy," *Int Jt Conf Sci Technol Chapter ICSS (international Conf Soc Sci)*, pp. 149–53, 2019. Available: <https://journal.trunojoyo.ac.id/ijcst/article/view/8222>.
- [24] Mince Yare, "Peran Ganda Perempuan Pedagang Dalam Meningkatkan Kesejahteraan Keluarga Di Kelurahan Karang Mulia Distrik Samofa Kabupaten Biak Numfor," vol. 3, no. 2, pp. 17–28, 2021. Available: <https://ejournal.iyb.ac.id/index.php/copisusu/article/view/186>.