Grouper: Jurnal Ilmiah Perikanan
Vol. 17 No. 2 (2026) pp. 324 - 333
pISSN: 2086-8480 | eISSN: 2716-2702
Journal Homepage: https://grouper.unisla.ac.id/index.php/grouper

The Influence of Livelihood Strategies on the Subjective Well-being of Fishing Families in Kebumen

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Submitted: 09 May 2026 Revised: 14 September 2026 Accepted: 15 September 2026

Keywords:
Family fisheries; Kebumen; livelihood strategies; subjective well-being

ABSTRACT

Fishing families face complex challenges in building family well-being, ranging from the availability of open-access resources, high risk factors, high mobility, seasonal uncertainty, and unpredictable catch yields. This study aims to analyze the influence of livelihood strategies on the subjective well-being of fishing families. This study employs a quantitative cross-sectional design. Data collection was conducted through a survey of 160 fishing families in February–March 2025, analyzed using Spearman's correlation and Partial Least Squares-Structural Equation Modeling (PLS-SEM). Descriptive statistical analysis indicates that family income and per capita income have a positive relationship with livelihood strategies. The results of the path analysis indicate that livelihood strategies ($\beta = 0.324^{**}$, $t > 1.96$) have a significant positive direct effect on families' subjective well-being. This study concludes that to improve the subjective well-being of fishing families, a variety of livelihood strategies need to be implemented. This research can serve as input for the Kebumen Regional Government to encourage the diversification of livelihood strategies through the optimization of catch processing.

INTRODUCTION

Indonesia is an archipelagic nation, with the majority of its territory consisting of oceans. Data from the Ministry of Marine Affairs and Fisheries (KKP) indicates that of the 8.3 million km^2 total area of the Republic of Indonesia, 6.4 million km^2 is water territory (KKP 2020). Data from the KKP (2022) further indicates that 3,033,941 fishermen in Indonesia rely on the marine and fisheries sector to support their families and improve their well-being. However, the economic contribution of Indonesia's marine and fisheries sector to GDP (Gross Domestic Product) remains minimal, at just 2.8% (Sugandhi, 2022). This small economic contribution indicates that the fisheries and marine sector has not yet developed optimally. Consequently, the potential of the fisheries and marine sector has not yet become a strong source of income for fishermen, which in turn impacts the well-being of fishing families.

From a sociological perspective, fishing families face open-access resources, leading fishermen to move from one fishing location to another to maximize their catch, thereby creating high risks (Satria 2015). Another challenge relates to seasonal uncertainty, which threatens the livelihoods and well-being of fishermen (Otero *et al*. 2022). Climate change and extreme weather can threaten the livelihoods of fishing families (Sharffril *et al*., 2017). The significant impacts of climate change force fishermen to adopt significant livelihood strategies (Free *et al,* 2019).

Kebumen Regency is one of the regencies in Central Java Province that has a coastal area and marine waters. Fishing is an important livelihood activity among coastal communities in Kebumen Regency. According to data from the Central Statistics Agency (BPS, 2024), Kebumen Regency ranks first in Central Java Province for the highest percentage of the population living

in poverty, at 15.71%. Research by Sunarti (2013) indicates that one in four poor families in Indonesia is a fishing family. Stacey *et al*. (2021) confirm that the high poverty rate among small-scale fishing households in Indonesia impacts family well-being.

One of the causes of poverty among fishing families is income uncertainty resulting from the unpredictability of the fishing season. According to the Thursday, September 19, 2024, edition of Berita Kebumen, fishermen at the Pasir Fishing Port in Ayah District are experiencing a fish shortage. When fish are hard to come by, out of 600 boats, only about 25 are used for fishing trips. The catch is unsatisfactory and does not even cover the cost of going out to sea. Research by Nurani *et al*. (2024) demonstrates that fishermen's household income cannot meet their families' basic needs due to lean seasons that result in low catch volumes and soaring operational costs. On the other hand, during periods of surplus catch, prices at fish auctions continue to decline (Muhammad, 2023). Meanwhile, research by Johan *et al*. (2013) reveals that high fishermen's income allows all family needs to be met, thereby increasing the likelihood of greater well-being. Both lean seasons and periods of surplus catch will affect the income earned by fishing families, which in turn impacts the well-being of these families.

According to Nurani *et al*. (2024), livelihood strategies for fishermen are one solution to address the uncertainty of the fishing season and an effort to improve the income and well-being of fishing families. Research by Ilarahmi and Sihaloho (2019) confirms that the well-being of fishing families can improve if they implement livelihood strategies. Meanwhile, research by KC *et al*. (2019) reports that diversifying livelihood strategies by shifting to a combination of fishing and agriculture or non-agricultural work that supports the sustainability of fishing is an option for fishing families in Tonle Sap, Cambodia. The livelihood strategies employed by fishermen in the face of fishing season uncertainty are a critical issue to address, as they determine the well-being of fishing families. This study aims to analyze the impact of livelihood strategies on families' subjective well-being.

METHOD

This study employs a cross-sectional design, which involves data collection at a specific point in time. The study sites were purposively selected in Pasir Village, Karangduwur Village, Argopeni Village, and Srati Village, Ayah Subdistrict, Kebumen Regency, based on the fact that these areas have the largest number of fishermen in Ayah Subdistrict, Kebumen Regency (BPS Kebumen, 2024). Data collection was conducted in February–March 2025.

The study population consisted of fishing families residing in Pasir Village, Karangduwur Village, Argopeni Village, and Srati Village, with the wives of these families serving as respondents, as they were considered capable of describing and explaining their families' circumstances. The sampling technique used was purposive sampling. Based on data from the Kebumen Regency BPS (2024), there are 533 fishermen in Pasir Village, 508 fishermen in Karangduwur Village, 433 fishermen in Argopeni Village, and 267 fishermen in Srati Village, bringing the total population to 1,741 fishing families. A total of 160 fishing families were selected as the sample. The sample size was calculated based on Ding *et al*. (1995) in Ranatunga *et al*. (2020), which states that the minimum sample size for SEM is 100–150 samples. The sampling process is illustrated in Figure 1.

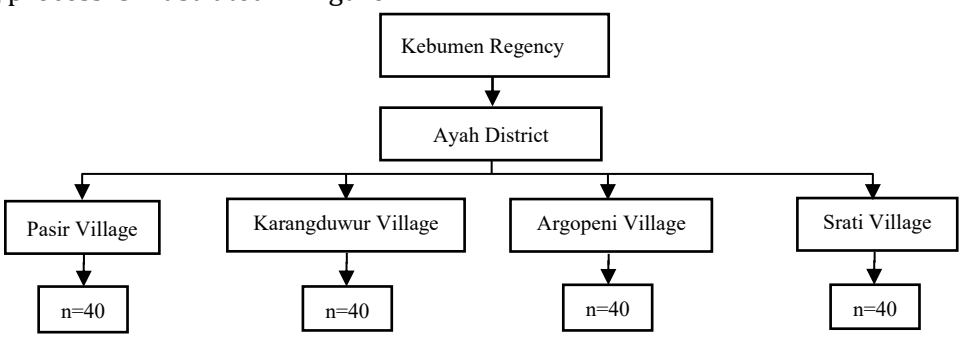


Figure 1. Sample Collection Procedure

Data were collected via a questionnaire covering age, highest level of education, family size, family income, per capita income, livelihood strategies, and subjective family well-being. Livelihood strategies were measured using a modified version of the instrument by Begum *et al*. (1998) with a Cronbach's alpha value of 0.613, consisting of 14 statements on a three-point scale: 0 = disagree, 1 = neutral, 2 = agree. Family subjective well-being was measured using the SEJAHTERA-GA instrument (Sunarti 2021) with a Cronbach's alpha value of 0.931. The subjective well-being questionnaire consists of 30 indicators across three aspects: economic, social, and psychological subjective well-being. Ratings use a semantic scale ranging from 1 = low conformity to 7 = high conformity. This study received ethical approval from the IPB University Human Research Committee under approval number: 1609/IT3.KEPMSM-IPB/SK/2025.

Table 1. Operational Definitions of Variables

Variable	Operational Definitions
Livelihood Strategy	Respondents' perceptions of various livelihood activities undertaken to ensure survival
Family Subjective Well-being	Respondents' perceptions of family satisfaction in meeting basic needs and supporting development, encompassing physical-economic, social, and psychological aspects

The data analysis methods used in this study consisted of descriptive and inferential analysis. Descriptive analysis was conducted to identify family characteristics, livelihood strategies, and subjective family well-being. During data processing, each variable was assigned a score for each questionnaire item. Subsequently, the total score for each variable was converted into an index ranging from 1 to 100 using the following formula.

$$\text{Index} = \frac{\text{Maximum score} - \text{Minimum score}}{\text{Actual score} - \text{Minimum score}} \times 100$$

Note:
Index = a score scale ranging from 0 to 100
Actual score = the score obtained by the respondent
Maximum score = the highest score a respondent can obtain
Minimum score = the lowest score a respondent can obtain

RESULT AND DISCUSSION

Overview of the Study Area

Ayah Subdistrict is a subdistrict in Kebumen Regency, Central Java Province, Indonesia. Ayah Subdistrict is characterized by a series of karst hills that form part of the Southern Gombong karst region; the average elevation of Ayah Subdistrict is 335 meters above sea level. The boundaries of Ayah Subdistrict are as follows:

1. To the west, it borders Cilacap Regency
2. To the east, it borders Buayan Subdistrict
3. To the north, it borders Rowokele Subdistrict
4. To the south, it borders the Indian Ocean.

Pasir Village is one of the villages in Ayah Subdistrict, Kebumen Regency. Covering an area of 3.54 km^2—or 4.64% of the total area of Ayah Subdistrict—the village is situated at an elevation of 529 meters above sea level. Pasir Village is 20 km from the subdistrict center and 35 km from the center of Kebumen Regency. This village has a population of 3,101 people. Pasir Village is divided into 19 Neighborhood Units (RT) and 3 Community Units (RW). Karangduwur Village has a total area of 4.15 km^2 or 5.43% of the total area of Ayah Subdistrict; it is situated at an elevation of 529 meters above sea level. The distance from Karangduwur Village to the subdistrict center is 14 km, and to the center of Kebumen Regency is 41 km. This village has a population of 5,099 people. Karangduwur is divided into 27 Neighborhood Units (RT) and 4

Community Units (RW). Argopeni Village covers an area of 5.30 km^2, or 6.94% of the total area of Ayah Subdistrict; it is located at an elevation of 529 meters above sea level. Argopeni Village is 12 km from the subdistrict center and 42 km from the center of Kebumen Regency. The village has a population of 3,845. Argopeni Village is divided into 24 Neighborhood Units (RT) and 5 Community Units (RW). The village covers an area of 3.52 km^2 or 4.61% of the total area of Ayah Subdistrict; it is situated at an elevation of 529 meters above sea level. The distance from Srati Village to the subdistrict center is 16 km, and to the center of Kebumen Regency is 39 km. This village has a population of 4,071 people. Srati Village is divided into 28 Neighborhood Units (RT) and 5 Community Units (RW). In these four villages, there are Fish Auctions (TPI), namely the Pasir Fish Auction, the Karangduwur Fish Auction, and the Pedalen Fish Auction (BPS, 2024). The Karangduwur and Argopeni fishing communities are known for their pelagic fish and crustaceans, particularly lobsters (Widianti *et al.* 2021). Other fish catches also include export commodities such as layur (Trichiurus sp.) and white pomfret (Pampus argenteus) (Nurani *et al.* 2023).

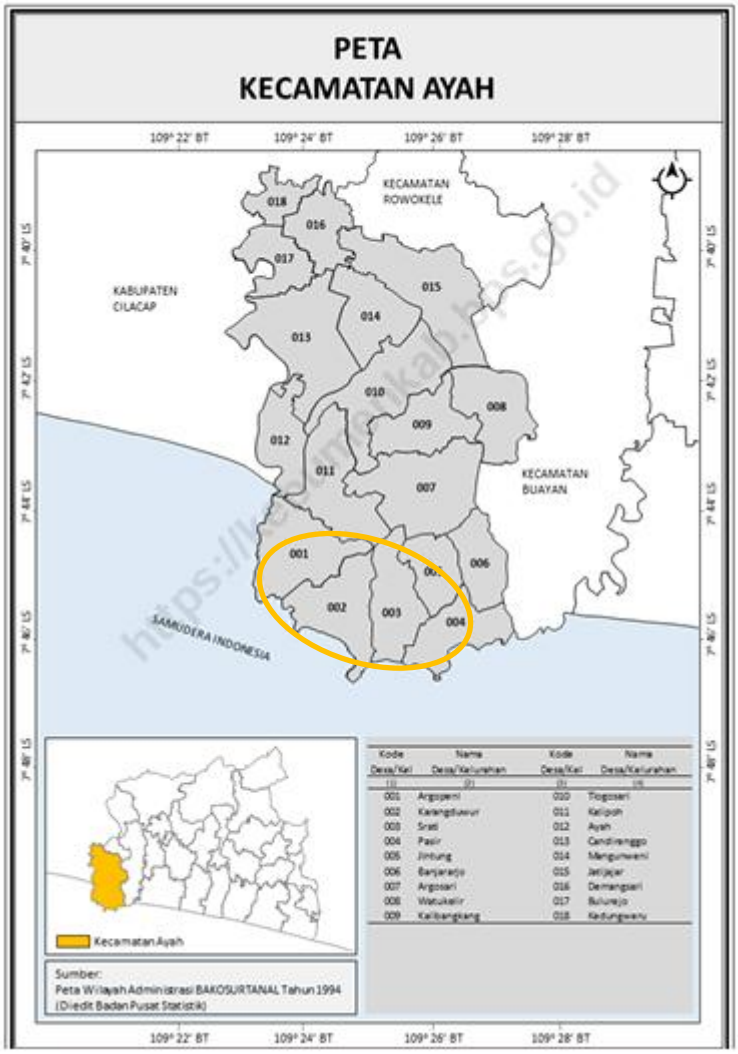


Figure 2. Research Location

Family Characteristics

Wives' ages range from 23 to 65 years, with an average age of 41.81 years. Meanwhile, husbands' ages range from 26 to 70 years, with an average age of 45.79 years. These average ages indicate that both husbands and wives fall into the middle-aged category. Husbands' ages are higher than wives' ages. Based on Central Java Governor's Decree No. 561/45 of 2024, the 2025 minimum wage for Kebumen Regency is Rp 2,259,873.55. The average income of fishing

families is Rp 2,072,250.00 (below the minimum wage). Family income ranges from Rp 150,000.00 to Rp 15,000,000.00, with an average of Rp 2,072,250.00 and a standard deviation of Rp 1,718,508.92. They are classified as poor, yet nearly half of them are extremely poor. Family income ranges from Rp 30,000.00 to Rp 3,750,000.00, with an average of Rp 540,765.63, reflecting income inequality among families. (Table 2).

Table 2. Distribution of age and income characteristics

Family Characteristics	Minimum	Maximum	Mean	Standard Deviation
Wife's age (years)	23	65	41,81	8,25
Husband's age (years)	26	70	45,79	8,25
Family size (persons)	3	6	3,94	0,84
Family income (Rp)	150.000	15.000.000	2.072.250	1.718.508,9
Per capita income (Rp)	30.000	3.750.000	540.765,63	439.929,72

Nearly half of the wives (47.5%) have junior high school as their highest level of education, and more than two-fifths (41.9%) of the husbands have elementary school as their highest level of education. The percentage of husbands (8.1%) who did not complete elementary school is higher than that of wives (3.7%). Only a small proportion of wives (1.3%) and husbands (1.3%) have a college education. The number of family members ranges from 3 to 6, with an average of 3.94 (Table 3).

Table 3. Distribution of educational characteristics

Family Characteristics	Did not complete elementary school (%)	Completed elementary school (%)	Completed junior high school (%)	Completed senior high school (%)	Completed college (%)
Wife	3,7	31,9	47,5	15,6	1,3
Husband	8,1	41,9	40,0	8,8	1,3

Livelihood Strategies

The livelihood strategy (as shown in Table 4) indicates an average index score of 65.89. Nearly all fishing families have shifted their catch targets to other fish species. Although nearly all fishing families are not involved in aquaculture—such as fish, shrimp, or shellfish farming in ponds or cages—more than one-third of them hold more than one job. Additionally, the majority of fishing families have both the husband and wife working. When at sea, fishermen generally do not carry spare engines but use maps, compasses, or GPS to navigate fishing grounds. Core strategies such as using fishing gear appropriate for the target catch, adjusting fishing times, diversifying fish species, and exploring new fishing grounds are common strategies employed by all fishermen regardless of their economic status.

Table 4. Minimum, maximum, average, and standard deviation values of livelihood strategy variables

Variable	Minimum	Maximum	Mean	Standard Deviation
Livelihood Strategy	36	86	65,89	8,54

Family Subjective Well-being

Family subjective well-being measures the level of family satisfaction regarding the fulfillment of basic and developmental needs, in the physical-economic, social, and psychological dimensions. The average family subjective well-being score was 80.90 (Figure 3). In the economic dimension, the average score was 75.08. The indicator with the highest average score was the ability to finance and provide education for children, while the lowest average

score was for the indicators of self-managed finances and finances managed by a spouse. In the social dimension, the average score was 80.61. The indicator with the highest average score was relationships among family members, while the lowest average score was found in the indicator of support and assistance from outside the family. In the psychological dimension, the average score was 87.01. Family harmony was the strongest indicator, followed by family communication and togetherness, as well as the roles and duties of husbands and wives. Meanwhile, the indicator with the lowest score was their role as members of the wider community.

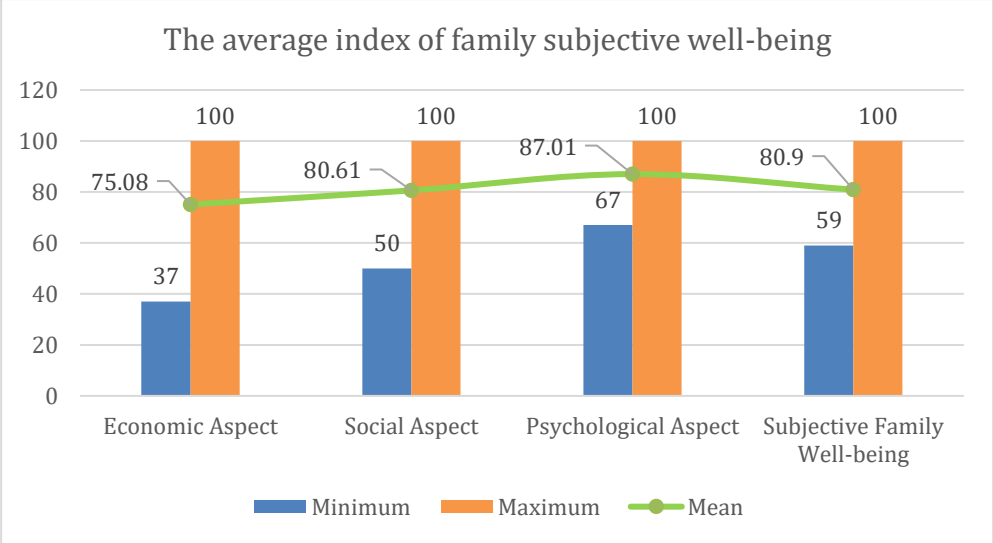


Figure 3. Average family subjective well-being index

The Relationship Between Family Characteristics and Research Variables

The results of the correlation analysis presented in Table 5 indicate that most family characteristics have a weak relationship with the variables of livelihood strategies and subjective family well-being. Family income ($r = 0.184$; $p < 0.05$) and per capita income ($r = 0.180$; $p < 0.05$) showed a positive and significant correlation with the livelihood strategy variable. This means that the higher the family income and the average income per family member, the greater the family's ability to implement livelihood strategies. Other characteristics, such as the wife's age, the husband's age, the wife's education, the husband's education, and the number of family members, did not show a significant correlation ($p > 0.05$) with the variables of livelihood strategies and subjective family well-being.

Table 5. Correlation coefficients between family characteristics and family livelihood strategies and subjective well-being.

Variable	Livelihood Strategies	Subjective Family Well-being
Wife's age	0.075	-0.005
Husband's age	0.098	0.052
Wife's education	-0.095	0.027
Husband's education	-0.077	0.034
Family size	0.020	-0.089
Family income	0.184*	0.114
Per capita income	0.180*	0.149

Note: * indicates significance at $p < 0.05$

The influence of on subjective family well-being

Based on the model from the empirical study, hypothesis testing was then conducted by examining the path coefficients and t-values in the structural equation model. A t-value greater than 1.96 indicates that the relationship between variables is significant, whereas if t < 1.96, the relationship is considered insignificant. The path analysis results presented in Table 6 show that livelihood strategies (β = 0.324**, t > 1.96) have a significant direct effect on family subjective well-being. This finding confirms that more adaptive and diverse livelihood strategies contribute significantly to improving family well-being, as they enable families to optimize their assets and resources, increase catch productivity, and reduce vulnerability to economic risks.

Table 6. Direct and indirect effects of factors affecting subjective family well-being

Direction of Influence	Direct	Total
Livelihood Strategies -> Subjective Family Well-being	0.324**	0.324**

Based on Figure 4, the results of the SEM analysis show that, among the variables of subjective family well-being, the psychological dimension (λ = 0.918) is the strongest, followed by the social dimension (λ = 0.816) and the economic dimension (λ = 0.812), indicating that perceptions of family satisfaction are more strongly influenced by the psychological and social dimensions than by the economic dimension.

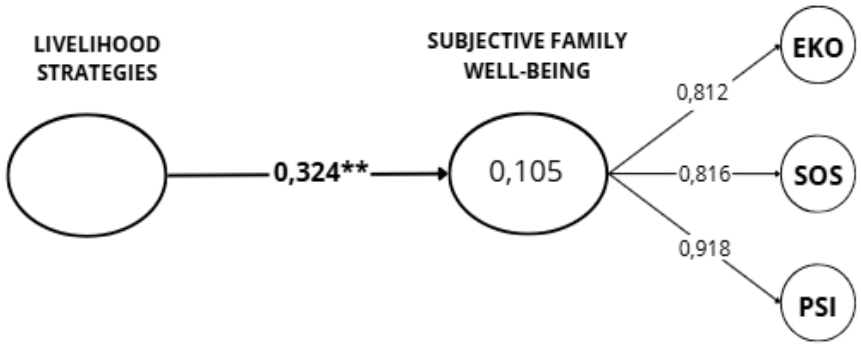


Figure 4. Results of the Structural Equation Modeling (SEM) analysis for a family of fishermen.

Description:

SN	:	Livelihood Strategies	SOS	:	Social Aspects
EKO	:	Economic Aspects	PSI	:	Psychological Aspects

The results of the correlation analysis indicate that most family characteristics have a weak relationship with the variables of livelihood strategies and subjective family well-being. Family income (r = 0.184; p < 0.05) and per capita income (r = 0.180; p < 0.05) show a positive and significant correlation with the livelihood strategies variable. This indicates that economic factors play a role in supporting families' ability to develop livelihood strategies. These findings align with a study by Alemu (2023), which found that households with higher income levels are more likely to diversify their livelihood strategies as a response to economic and environmental uncertainty. Meanwhile, research by Johan *et al*. (2013) revealed that high fishermen's income allows all family needs to be met, thereby increasing the likelihood of greater well-being. Both lean periods and surpluses in catch yields will affect the income earned by fishing families, which in turn impacts the well-being of these families.

This study was conducted to examine the effect of livelihood strategies on families' subjective well-being. The research hypothesis is that the livelihood strategies employed by

fishing families have a significant effect on the subjective well-being of these families. The findings indicate that livelihood strategies significantly influence families' subjective well-being. These results align with those of a study by Nurani *et al*. (2024), which states that through livelihood strategies, fishermen can mitigate the uncertainty of fishing seasons in an effort to increase family income and well-being. In this study, livelihood strategies that contribute to improved subjective well-being among fishing families include using fishing gear such as gillnets tailored to the type of catch (100%), shifting target species to other fish types (98.75%), processing fish through simple methods like making salted fish (83.75%), and adjusting fishing schedules (64,17%). This is supported by research by Sunarti *et al*. (2010), which shows that the most common adaptation measures taken by fishermen are increasing fishing schedules and selling salted fish. A study by Querdiola (2023) further supports these findings, indicating that fishermen diversify their fishing gear according to resource conditions to maximize catch yields, which ultimately improves their well-being. A study by Suadi *et al*. (2021) also found that fishermen in Betahlawang Village, Demak, employ livelihood strategies such as expanding their fishing grounds and extending their fishing hours on certain days, such as Fridays.

Research by Rahman *et al*. (2023) on fishing families in East Java also shows that fishermen employ livelihood strategies such as increasing fishing intensity, adjusting fishing times, and exploring new locations to boost productivity and sustain their livelihoods. These livelihood strategies have been shown to significantly improve subjective well-being, particularly in terms of happiness and life satisfaction. Diversifying livelihood sources by venturing into fish processing, agricultural activities, or other sectors can reduce economic vulnerability and enhance the resilience of fishing households, ultimately contributing to the subjective well-being of fishing families (Szymkowiak, 2020).

The diversification of livelihoods outside of fishing undertaken by Kebumen fishermen includes farming, working as laborers, trading, and raising livestock (52.08%). This is supported by the research of Sunarti et al. (2009), which states that dual-income patterns serve as a consolidation strategy that can be used as a source of security (to mitigate risks) against the seasonal nature of income. However, job diversification alone is not sufficient to improve families' subjective well-being. Therefore, Sunarti (2015) advocates for the development of family-friendly regions as a strategy to enhance well-being through the development of livelihood patterns based on local potential. These findings have important implications for future research, particularly regarding the subjective well-being of fishing families in the context of livelihood strategies. The results of this study can serve as input for the government, particularly the Kebumen Regency Government, which needs to encourage the diversification of livelihood strategies through the optimization of fish processing. From a methodological perspective, further research using a mixed-methods design is highly recommended to produce more comprehensive research findings.

CONCLUSION

The research findings indicate that the average age of husbands and wives falls within the middle-adulthood category. The average income of fishing families is Rp 2,072,250.00 (below the minimum wage), with nearly half classified as poor families. The average educational level of fishing families indicates that nearly half have a junior high school education (wives) and an elementary school education (husbands), and most live in nuclear families with relatively few members. The average livelihood strategy of fishing families falls into the moderate category. Based on the research results, to improve the subjective well-being of fishing families, families can strive to improve their livelihood strategies.

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