



UDC 332

## **DETERMINANTS OF PRODUCTIVITY AND WELFARE OF FISHERMEN IN MELAYA DISTRICT OF JEMBRANA REGENCY, INDONESIA**

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### **ABSTRACT**

Small fishermen are a group of fishermen who are considered socially and economically vulnerable, with low productivity and welfare. One of them is seen in the difficulty of fishermen meeting their daily needs because the catch is uncertain. Factors that influence fishermen's welfare are influenced by several factors such as working capital, technology and work experience. This research aims to analyze the influence of working capital, technology and work experience on the productivity and welfare of fishermen in Melaya District, Jembrana Regency. The research design used is a quantitative approach. Data collection in this research was carried out through observation, interviews, questionnaires and in-depth interviews. This research uses primary data, namely population data of 3,421 fishermen and questionnaires to 200 fishermen in Melaya District, Jembrana Regency directly. The sampling method uses proportionate random sampling. The data analysis technique in this research uses the Partial Least Square (PLS) analysis approach. PLS is a component or variant-based Structural Equation Modeling (SEM) model. The research results show that working capital, technology and work experience have a positive and significant effect on the productivity of fishermen in Melaya District, Jembrana Regency. Working capital and work experience have a positive and significant effect, while technology has a positive but not significant effect on fishermen's welfare. Productivity has a positive and significant effect on welfare. Indirectly, working capital, technology and work experience have a significant effect on fishermen's welfare through productivity. Fishermen go to sea more often so they can earn more income so that fishermen's welfare can increase. Fishermen are more enthusiastic and hone their skills so that their fishing tasks become more productive, resulting in more catches. Fishermen add fishing gear so that more fishing gear can be used for fishing to produce more catches. Fishermen who don't know the technological methods of catching fish must learn from other fishermen who are already proficient with advanced methods for catching fish. The way to do this is by going to sea together. Fishermen go to sea more often to gain experience, so it will be very helpful in producing more fish catches.

### **KEY WORDS**

Working capital, technology, work experience, productivity, welfare.

Indonesia is an archipelago consisting of tens of thousands of islands. This fact allows the emergence of aquatic life structures that give rise to population settlements around the coastline. In this case, to fulfil their daily needs, the people who live in the coastal area generally choose to work as fishermen in addition to other side jobs. Indonesia's marine and fisheries resources play an important role in national development from economic, social, security and ecological aspects. With a total sea area of approximately 5.8 million square kilometres (km<sup>2</sup>) consisting of 3.1 million km<sup>2</sup> of territorial waters, and 2.7 waters of Indonesia's exclusive economic zone, the position and location of Indonesia's archipelago consisting of 17,504 islands is very important in the trade system and the provision of raw materials for national and international communities. In addition, the archipelagic location of the region makes it possible for the Indonesian nation to build an economy based on marine and fisheries resources (Apridar, 2011).

Coastal areas are globally related to the tendency of concentration of economic activities and human civilisation, which accommodate about 60 per cent of the world's population (Rustiadi, 2009). The coastal area is a landing place for the results of various



marine resources, for example, fish because from coastal areas many economic activities are carried out, one of which is trade carried out by fishing communities. Coastal communities are communities whose majority of daily income comes from marine products, these communities are fishermen. Their daily activities are catching fish and collecting sea products such as crabs, seaweed, clams, oysters and so on. The income of fishermen who are already dependent on fate and a little will increase or decrease drastically. Side jobs cannot guarantee that fishermen can fulfil their daily needs (Mulyadi, 2005).

Empowerment of coastal communities is one of the new trends in the development paradigm in Indonesia after a long time of marine and coastal areas being forgotten in the development in Indonesia. So far, development in Indonesia has been very land-orientated and more specifically very orientated towards heavy industry. After all this time, it was realised that such a development paradigm did not have the trickle-down effect that was initially assumed and expected. That is why the quality of fishing communities is lower, reflected in the many pockets of poverty found in fishing communities. Coastal and marine areas that are rich in natural resources have been utilised by the Indonesian people as one of the main sources of food, especially animal protein, for centuries. The history of development since independence to date is inseparable from the problem of poverty that afflicts some Indonesian people, and the liberal democratic order at the beginning of independence, up to the reform order since 1998 until now, has not been able to erase the problem of poverty, especially in fishing communities. The poverty trap that engulfs the lives of fishermen is caused by complex factors. These factors are not only related to fluctuations in fishing seasons, limited human resources, capital and access, and fish trade networks that are exploitative towards fishermen as producers but also caused by the negative impact of fisheries modernisation that encourages excessive depletion of marine resources. In social reality, it is often seen that the need for cooperation is a solution to improve the standard of living in people's lives. The reality is that often when a person has capital but cannot manage and develop productive businesses, and vice versa, this is where a person establishes a cooperative relationship with others to meet their needs (Budiman, 2011).

Fishermen are people or individuals who are active in fishing and other aquatic stars. The level of income of fishermen is largely determined by the catch, the amount of catch is also reflected in the amount of income received by fishermen, which will be mostly used for family consumption. Thus, the level of fulfilment of family consumption needs is largely determined by the income received. Fishermen can be divided into three groups, namely labour fishermen, fishermen, and individual fishermen. Labourer fishermen are fishermen who work with fishing gear owned by others. Juragan fishermen are fishermen who own fishing gear operated by other people, while individual fishermen are fishermen who own their fishing gear, and its operation does not involve other people (Subri, 2005). Fishing gear is equipment or facilities used by fishermen to catch/take sea products. Fishing equipment consists of boats/vessels and fishing gear such as trawls, fishing nets, and others. The dependence of fishermen on fishing technology is very high, because in addition to the condition of mobile fishery resources, which are easy to move from one place to another, also for fishing fishermen need the means to survive for a long time on the water (Acheson, 1981).

In terms of type, fishing technology can be divided into two categories, namely traditional and modern. The fishing community is a community that lives in coastal areas with the main livelihood being the utilisation of natural resources (SDA) contained in the ocean, be it in the form of fish, shrimp, seaweed, shellfish, coral reefs and other marine products. Fishing communities have special characteristics that distinguish fishermen from other communities, namely characteristics that are formed from life in the ocean which is very hard and full of risks, especially risks that come from natural factors. Coastal areas are known to have unique characteristics and a very high diversity of potential natural resources, both biological and non-biological. Therefore, the rate of increase in the number of fishermen in Indonesia is very rapid. This is because marine fisheries are a large resource. However, there are also many obstacles experienced by fishermen, so the catches obtained are only small. This condition causes fishermen to become unprofitable.



The level of community welfare reflects the improved quality of life of a family because community welfare is the essence of development (Putri, 2016). A family with a higher level of welfare means having a better quality of life so that in the end the family can create better conditions to improve the welfare of fishermen (Prabawa, 2018). The fishing community has different characteristics of life because the pattern of life is formed from life in the ocean that has never been faced by other communities where there are great risks, especially risks that come from natural factors, so it needs a special strategy to work (Rahim, 2018).

In addition to natural factors, the facilities owned by fishermen are very minimal which causes difficulties in obtaining fish catches. This condition causes fishermen to be less prosperous (Kusnadi, 2015). The condition of fishermen's welfare depends on the condition of the coast (Sugiharto, 2017). The difficulty of improving the welfare of traditional fishermen is influenced by several factors, namely the limited quality of human resources, limited working capital capabilities, limited working time (hours), productivity, and information on fishing technology (Takariani, 2015). Difficulties in diversifying fishing businesses as well as the marketing system of fishery products that is more favourable to intermediary traders (Mulyadi, 2005).

Based on this explanation, several factors can affect the welfare of fishermen, including working capital, technology, working hours and productivity. Capital in the economic sense is the result of production used to produce further production (Maulidah, 2012). Capital is a factor of production that has a strong influence on obtaining productivity or output (Umar, 2015). Research from Muda (2017) shows that working capital affects the welfare of fishermen.

Another factor that can affect welfare is technology. Amir (2020) states that technological progress occurs because new ways or improvements to old ways of handling traditional jobs are found, and are the result of human findings. Technology can be said to be a double-edged sword. On the one hand, it can bring humans to a higher level of prosperity and welfare, but at the same time, it can also bring damage to humans themselves. Technology is a way of doing things to fulfil human needs with the help of tools and reason, thus strengthening or making more powerful the human limbs, senses and brain. The dependence of fishermen on fishing technology is very high. This is because in addition to the condition of mobile fishery resources, which is easy to move from one place to another, also to catch them fishermen need aid to survive for a long time on the water. This statement is supported by the results of research from Rowan (2023) showing that technology can support fishermen to improve their welfare of fishermen. Mazuki's research (2020) states that the use of technology at sea provides positive benefits to the welfare of fishermen. Research from Muda (2017) shows that the use of technology at sea affects the welfare of fishermen.

An important factor that also needs to be considered that can affect welfare is work experience. Work experience is the degree of mastery of a person's knowledge and skills at work, which can be measured by the length of work and the level of knowledge and skills (Joseph, 2019). In this case, a fisherman needs experience to increase fish production or fishing. The more experienced working in all matters related to fishing, the more productivity obtained will also increase. Supporting research related to the importance of fishermen's experience for fishermen's welfare carried out by Gushendri (2022) shows that fishing experience greatly affects fishermen to improve their welfare. Research from Muda (2017) shows that work experience at sea affects the welfare of fishermen.

Another important factor that can affect fishermen's welfare is productivity. According to Sinungan (2018), increasing productivity is the same as increasing labour input where the input is interpreted as income because income can generate rupiah to meet the needs of daily life, so productivity is said to have a direct influence on improving family welfare. Productivity can affect the welfare of labour because the greater the productivity, labour will get a reward or reward from the results of work in the form of wages (Simanjuntak, 2018). Increasing productivity is the same as increasing wages because wages are used to meet the needs of life, which will affect productivity and have implications for labour welfare (Sinungan, 2018).



According to Law No. 13 of 2003 on Manpower, labour welfare is a fulfilment of physical and spiritual needs and/or necessities, both inside and outside the working relationship, which can increase work productivity. In Indonesia, welfare is measured by the value of the rupiah spent by a person to fulfil their needs. The rupiah value is categorised in the form of wages as a result of increased work productivity (Widyastuti, 2017). Supporting research on the relationship between productivity and fishermen's welfare conducted by Zulkpli (2021) states that productivity in fishing can contribute to improving their welfare.

The number of fishermen in 34 provinces in Indonesia in 2022 was 2,359,064 people, while Bali Province had 62,302 fishermen. The details of the number of sea fishermen in Bali Province are presented in Table 1.

Table 1 – Number and Production of Sea Fishermen by Regency / City in Bali Province in 2021-2022

No	Regency/City	2021		2022	
		Fisherman (People)	Production (Ton)	Fisherman (People)	Production (Ton)
1.	Jembrana	9.282	26.797	9.171	22.434
2.	Tabanan	910	3.851	806	3.864
3.	Badung	2.788	8.546	2.436	9.202
4.	Gianyar	824	1.492	798	1.697
5.	Klungkung	1.661	19.243	1.557	18.369
6.	Bangli	-	-	-	-
7.	Karangasem	23.953	26.225	23.519	26.465
8.	Buleleng	7.411	14.919	7.035	20.237
9.	Denpasar	17.129	21.705	16.980	34.402
Bali Province		63.958	122.778	62.302	136.670

Source: Bali Province Marine and Fisheries Service, 2023.

Based on Table 1, it can be explained that the number of sea fishermen in Bali Province in 2021 is 63,958 people with a production of 122,778 tons; in 2022 it will be 62,302 people with a production of 136.67 tons. When viewed by district, the most fishermen are in Karangasem Regency in 2021 with 23,953 people with a production of 26,225 tons, and in 2022 with 23,519 people with a production of 26,465 people. The least fishermen are in Gianyar Regency in 2021 as many as 824 people with a production of 1,697 tons. When viewed in Denpasar City, the number of fishermen in 2021 was 17,129 people with a production of 21,705 people and in 2022 there were 16,980 people with a productivity of 34,402 tons. Jembrana Regency is an area that has the third most fishermen in Bali Province. One of the districts in Jembrana Regency is Melaya District. Problems related to the productivity of fishermen based on observations through observations and questions and answers to several fishermen in Melaya District, Jembrana Regency, coastal communities are known to have low average income. The fishing community is behind when compared to other communities engaged in other fields. This is due to the limited quantity and quality of fishing gear and the low creativity of fishermen in managing post-capture fish. Most communities in coastal areas are generally dependent on marine or coastal resources, so many of the communities make their main livelihoods as fishermen.

Table 2 – Productivity of Sea Fishermen by Regency / City in Bali Province in 2018-2022 (Tons / Year)

No	Regency / City	2018	2019	2020	2021	2022
1.	Jembrana	3,00	2,96	2,92	2,89	2,45
2.	Tabanan	4,15	4,10	4,75	4,23	4,79
3.	Badung	3,17	3,13	3,15	3,07	3,78
4.	Gianyar	2,03	2,00	1,90	1,81	2,13
5.	Klungkung	12,38	12,22	11,84	11,59	11,80
6.	Bangli	-	-	-	-	-
7.	Karangasem	1,12	1,11	1,10	1,09	1,13
8.	Buleleng	2,11	2,09	2,04	2,01	2,88
9.	Denpasar	1,32	1,31	1,28	1,27	2,03
Bali Province		29,28	28,92	28,99	27,96	30,97

Source: Bali Province Marine and Fisheries Service, 2023.

Table 2 explains that the productivity of fishermen in each Regency / City in Bali Province from 2018 was 29.28 tons/year, in 2019 it decreased to 28.92 tons/year, in 2020 it





increased to 28.99 tons/year, then in 2021 it decreased to 27.96 tons/year, and in 2022 it increased to 30.97 tons/year. Fluctuating conditions (ups and downs), productivity in Jembrana Regency is the fourth lowest, this shows that fishermen in Jembrana Regency have not been able to consistently increase their catch. This means that the productivity of sea fishermen in Jembrana Regency is experiencing problems, so this can lead to a decrease in the welfare of fishermen.

Table 3 – Value of Marine Fisheries Production by Regency / City in Bali Province in 2018-2022 (in thousand rupiah)

No	Regency / City	2018	2019	2020	2021	2022
1.	Jembrana	462.877.082	396.751.784	330.626.487	324.063.457	287.703.410
2.	Tabanan	135.327.626	115.995.108	96.662.590	99.039.372	100.163.115
3.	Badung	225.331.218	193.141.044	160.950.870	196.459.415	171.186.830
4.	Gianyar	54.405.176	46.633.008	38.860.840	41.571.751	48.529.355
5.	Klungkung	66.231.963	56.770.254	47.308.545	102.682.558	263.999.228
6.	Bangli	-	-	-	-	-
7.	Karangasem	813.150.359	696.986.022	580.821.685	663.594.835	648.495.700
8.	Buleleng	811.013.956	695.154.820	579.295.683	354.961.970	612.644.108
9.	Denpasar	1.103.323.109	945.705.522	788.087.935	977.543.947	943.607.030
	Bali Province	3.671.660.489	3.147.137.562	2.622.614.635	2.759.917.305	3.076.328.776
	Progress (%)	-	-14,29	-16,67	5,24	11,46

Source: Bali Province Marine and Fisheries Service, 2023.

Table 3 can explain that the production value of fishermen for the period 2018-2022 for Tabanan, Klungkung, Gianyar and Buleleng regencies experienced an increase in marine fish catches, while Denpasar, Karangasem, Jembrana and Badung experienced a decrease in the value of marine fish catches so that the production value of marine fishermen during 2018-2022 decreased. Jembrana Regency experienced the fourth-largest decrease in production value. Overall, the development of the value of marine fisheries production in Bali Province in 2018-2019 decreased by 14.29 per cent, in 2019-2020 decreased by 16.67 per cent, in 2020-2021 increased by 5.24 per cent and in 2021-2022 increased by 11.46 per cent.

Table 4 – Number, Production of Sea Fishermen by Sub-district in Jembrana Regency (2021-2022)

No	District	2021		2022	
		Fisherman (People)	Production (Ton)	Fisherman (People)	Production (Ton)
1.	Pekutatan	2.229	6.699	2.392	5.609
2.	Mendoyo	1.498	402	1.622	3.365
3.	Jembrana	951	268	919	2.243
4.	Negara	663	134	817	1.122
5.	Melaya	3.941	12.059	3.421	10.095
	Jembrana Regency	9.282	26.797	9.171	22.434

Source: Department of Marine, Fisheries and Forestry, Jembrana Regency, 2023.

Table 4 shows the number of fishermen in Jembrana Regency in 2021 was 9,282 people, in 2022 it decreased to 9,171 people. This decrease in the number of fishermen was also followed by a decrease in the number of fishermen's production in 2021 of 26,797 tons to 22,434 tons in 2022. Melaya sub-district experienced the first largest decrease in the number of fishermen from 2021-2022 and the first highest decrease in production during 2021-2022.

Table 5 explains that the productivity of fishermen in each sub-district in Jembrana Regency from 2018-2022 has fluctuated (up and down), and the catch is still very low, especially Melaya Sub-district in 2022 the amount of catch productivity of 2.95 tons / year is the fifth lowest, meaning that during 2022 fishermen in Melaya sub-district are only able to produce 2.95 tons / year in each year from all existing fishermen. This means that the catch of fishermen is still very low. This means that the production of sea fishermen in each sub-district in Jembrana Regency is experiencing problems, so this can cause the welfare of fishermen to decline. Another problem of fishermen in Melaya Subdistrict that causes a



decrease in productivity is the limitation of fishing technology. with limited technology, the dependence on the season is very high, and the fishing area is also limited. as a result the catch is also limited.

Table 5 – Productivity of Fishermen by Sub-district in Jembrana Regency in 2018-2022 (Tons/Year)

No.	District	2018	2019	2020	2021	2022
1.	Pekutatan	3,25	2,67	3,01	3,01	2,34
2.	Mendoyo	2,90	2,38	2,69	2,68	2,07
3.	Jembrana	3,05	2,50	2,83	2,82	2,44
4.	Negara	2,18	1,79	2,03	2,02	1,37
5.	Melaya	3,31	2,72	3,07	3,06	2,95
Jembrana Regency		14,69	12,07	13,62	13,59	11,18

Source: Department of Marine, Fisheries and Forestry, Jembrana Regency, 2023.

Table 6 – Value of Marine Fisheries Production by Sub-district in Jembrana Regency in 2018-2022 (in thousand rupiah)

No	District	2018	2019	2020	2021	2022
1	Pekutatan	30.087.010	25.788.866	21.168.890	20.748.681	18.420.671
2	Mendoyo	37.030.167	31.740.143	19.512.713	19.125.380	16.979.505
3	Jembrana	6.943.156	5.951.277	44.222.254	43.344.429	38.481.167
4	Negara	300.870.103	257.888.660	217.347.103	213.032.701	189.130.348
5	Melaya	87.946.646	75.382.839	28.375.528	27.812.266	24.691.719
Jembrana Regency		462.877.082	396.751.784	330.626.487	324.063.457	287.703.410
Progress (%)		-	-14,29	-16,67	-1,99	-11,22

Source: Department of Marine, Fisheries and Forestry, Jembrana Regency, 2023.

Table 6 shows that for all sub-districts in Jembrana Regency, the welfare value of fishermen for the 2018-2022 period has decreased, so that the welfare of sea fishermen during 2018-2022 has decreased. The decline in production value in Melaya sub-district in 2022 is the third highest. Overall, the development of marine fisheries production value in Jembrana Regency in 2018-2019 decreased by 14.29 percent, in 2019-2020 there was a decrease of 16.67 percent, in 2020-2021 there was a decrease of 1.99 percent and in 2021-2022 experienced a decrease of 11.22 percent. The results of research related to the productivity of fishermen getting results from the science and technology program for the community (IBM) have seen an impact where the profits of fishing fishermen have increased very significantly because the results obtained all go to sea fishermen and their productivity has also increased with fishing techniques that are suitable for the waters around the sub-district area. Malaya. Research results from Chaliluddin (2019), show that the productivity of catches over a period of 5 years (2011-2015) in Aceh Jaya Regency was highest for tuna, with the highest productivity value in 2014 amounting to 5193.3 kg/trip. Another leading commodity for capture fisheries in Aceh Jaya Regency is mackerel with a customer price index (CPI) analysis value of (1052.92), followed by tuna (515.54), trevally (398.59), tuna (309.18 ), anchovies (263.08) and skipjack tuna (234.58). Research results from Vibriyanti (2018) show that the capture fisheries sector in the city of Tegal has great potential as a driver of the local community's economy. This is evident from the growth of fish processing industries such as the fillet industry which absorbs a lot of workers, especially female workers. It's just that the empowerment programs provided by the government still encounter several obstacles in the field, especially in terms of equal access to programs with both physical and non-physical dimensions. The number and production of fishermen in Melaya sub-district are presented in Table 7.

Table 7 – Number and Production of Sea Fishermen in Melaya District in 2021-2022

No	Village	2021		2022	
		Fisherman (People)	Production (Ton)	Fisherman (People)	Production (Ton)
1.	Gilimanuk	1.517	4.824	1.368	4.824
2.	Candikusuma	1.387	4.221	1.197	4.221
3.	Melaya	601	1.809	513	1.809
4.	Tuwed	442	1.206	342	1.206
Melaya district		3.941	12.059	3.421	10.095

Source: Melaya District Fisheries Extension Officer, 2023.



Based on Table 7, it can be explained that the number of sea fishermen in Melaya District in 2021 was 3,947 people, decreasing in 2022 to 3,421 people because they were no longer productive in age and were not registered on their fisherman membership cards. The largest number of fishermen was in Gilimanuk Village and the smallest was Tuwed Village.

The problem related to the welfare of fishermen in the field is that it is difficult for fishermen to fulfil their daily needs because the catch is uncertain so that the fishermen's income is uncertain every day. The income level of fishermen in Melaya District is very dependent on the capital used, the use of fishing technology and experience in fishing. This is caused by several factors that cause the low level of welfare of fishermen in Melaya District, including very low human resources, traditional fishing methods, use of fishing technology equipment that is not optimal, bad habits in financial management, capital ownership, and technology. Fishermen are said to still lack access to capital for fishing operational costs (for example marine equipment). Fishermen also still lack knowledge regarding the use of income for business development. Fishermen's access to weather information, water waves and wind direction is still limited. So information on fish distribution locations is still obtained conventionally, handling emergency conditions is still lacking, and access to information about fish that the market needs is still lacking. Another problem is that fishermen in Melaya District still use simple fishing gear, not yet equipped with modern tools such as GPS, and this is exacerbated by the fact that fishermen in Melaya District still lack knowledge in using fishing gear, fishermen only learn through limited experience. so they don't understand the state of the waters.

Another problem for fishermen in Indonesia is irregularities and management, where location information and cold storage capacity are still limited, fishermen rely on ice cubes. Cold storage facilities at ports are still lacking and the quality of the catch will decline if there is no certainty of sales and cold storage facilities. The final problem is in the marketing sector, where fishermen still lack access to know the market price of their catch which can cause price fluctuations as well as a lack of support for the development of electronic marketing. Currently, fish caught are sold directly to the public to get fast cash turnover.

The results of research related to fishermen's welfare carried out by Triyanti (2016) show that the level of fishermen's welfare can be calculated using a sustainable livelihood approach which functions to determine relative welfare. The results of the analysis show that the fishermen's livelihood index is in the medium category (54.93 percent) and the achievement of the financial capital indicator (83.51 percent) is in the very good category; natural capital indicator (60.00 percent) in the medium category; the social capital indicator (13.20 percent) is in the poor category and the human resource capital indicator (56.65 percent) is in the medium category. Therefore, the recommended strategy for realizing sustainable livelihoods in Indramayu Regency is through increasing social capital indicators such as increasing welfare access to economic institutions, optimizing existing welfare institutions, especially in every government program, integrating informal institutions with formal institutions, and activating cooperative welfare. existing or establishing new fisheries cooperatives. Wulandari's research (2017) shows that the welfare level of fishermen in the research area is classified as a medium level of welfare, fishermen's income patterns are greater from fishing activities than non-fisheries, and fishermen's household consumption is more dominant in food consumption.

For the residents of Melaya District, marine resources are the main potential that drives the village economy. In general, village economic activities fluctuate because they are very dependent on the high and low levels of fisheries productivity. If productivity is high, the income level of fishermen will increase, so that the purchasing power of the community, most of whom are fishermen, will also increase. On the other hand, if productivity is low, fishermen's income levels will decrease so that people's purchasing power will be low. Such conditions greatly influence the strength and weakness of the village economy (Kusnadi, 2002 in Ekaningdyah, 2005).

Based on the problem formulation and previous research results, the hypotheses in this research are 1) Working capital, technology and work experience have a positive effect on the productivity of fishermen in Melaya District, Jembrana Regency; 2) Working capital,



technology, work experience and productivity have a positive effect on the welfare of fishermen in Melaya District, Jembrana Regency; 3) Working capital, technology and work experience influence the welfare of fishermen through productivity in Melaya District, Jembrana Regency.

### METHODS OF RESEARCH

The approach that will be used to examine the source of the problem in this research is quantitative. This research was conducted in Melaya District, Jembrana. The reason for conducting research in Melaya District, Jembrana is because there are problems regarding the productivity of coastal communities with low average incomes, and the difficulty of fishermen meeting their daily needs due to uncertain catches so that fishermen's income is uncertain every day. The scope of the research is working capital, technology and work experience on the productivity and welfare of fishermen in Melaya District, Jembrana Regency. The dependent variable (endogenous) uses Working Capital (X1), Technology (X2), Work Experience (X3). Intervening Variables use productivity (Y1) as an intervening variable. The independent variable uses fishermen's welfare (Y2) as the dependent variable. The population in this study are fishermen in 4 (four) villages in Melaya District, where the villages are located near the beach and some of the residents work as fishermen, namely Gilimanuk Village, Candikusuma Village, Melaya Village and Tuwed Village. The number of fishermen in Melaya District is 3,421 people, of which the largest number of fishermen is in Gilimanuk Village, namely 1,368 people and the smallest is Tuwed Village, with 343 people. The population referred to in this research is the fishermen of Melaya District, namely 3,421 people, divided into 2 (two), namely traditional fishermen who do not use technology as many as 2,077 people and modern fishermen with technology as many as 1,344 people. This research is survey research, where the data collected is a sample to represent the entire population. This research used 200 respondents who could represent the population to be studied. The sampling method uses proportionate random sampling. The details of the sample of fishermen from Melaya District, Jembrana Regency, Bali Province in 2022 are presented in Table 8.

Table 8 – Melaya District Sea Capture Fishermen Sample in 2022 (Person)

No	Desa	Type of Capture Fishermen		Sample
		Traditional	Modern (Technology)	
1.	Gilimanuk	$(831:1368) \times 80 = 49$	$(537:1368) \times 80 = 31$	80
2.	Candikusuma	$(727:1197) \times 70 = 43$	$(470:1197) \times 70 = 27$	70
3.	Melaya	$(311:513) \times 30 = 18$	$(202:513) \times 30 = 12$	30
4.	Tuwed	$(208:343) \times 20 = 12$	$(135:343) \times 20 = 8$	20
Melaya district		122	78	200

Source: Department of Marine, Fisheries and Forestry, Jembrana Regency, 2023.

Table 8 can be explains that the sample used in this study was 200 people with details of traditional fishermen as many as 122 people, modern fishermen with technology as many as 78 people spread in Gilimanuk Village, Candikusuma Village, Melaya Village and Tuwed 4 Village. The methods used in this study were observation, and interviews. In this study, data analysis used the Partial Least Square (PLS) approach.

### RESULTS AND DISCUSSION

Data analysis used a partial least square (PLS) approach. PLS is a structural equation modelling (SEM) equation model based on components or variants. Outlier model evaluation, also known as measurement model evaluation, is carried out to assess the validity and reliability of the model.

Discriminant validity relates to the principle that measurements (manifest variables) of different constructs should not be highly correlated. The way to test discriminant validity with reflexive indicators is to see the cross-loading value for each variable must be  $> 0.70$ . Based





on the table above, it can be seen that all cross-loading values for each indicator on each variable are greater than 0.7. Thus it can be stated that the data in the study are valid.

Table 9 – Convergent Loading Factor

	Welfare	Working Capital	Experience	Productivity	Technology
X1.1		0,754			
X1.2		0,728			
X1.3		0,865			
X1.4		0,734			
X1.5		0,762			
X1.6		0,721			
X1.7		0,864			
X2.1					0,743
X2.2					0,758
X2.3					0,722
X3.1			0,721		
X3.2			0,844		
X3.3			0,764		
Y1.1				0,741	
Y1.2				0,724	
Y1.3				0,704	
Y1.4				0,746	
Y1.5				0,714	
Y1.6				0,736	
Y2.1	0,831				
Y2.2	0,837				
Y2.3	0,804				

Source: Data processed, 2024.

Table 10 – Convergent AVE Validity Test Results

Variable	Average Variance Extracted (AVE)
Welfare	0,679
Working capital	0,645
Experience	0,605
Productivities	0,530
Technology	0,549

Source: Data processed, 2024.

Table 11 – Discriminant Validity Test Results

	Welfare	Working Capital	Experience	Productivity	Technology
X1.1	0,749	0,754	0,728	0,743	0,750
X1.2	0,794	0,728	0,743	0,763	0,719
X1.3	0,709	0,865	0,751	0,796	0,772
X1.4	0,748	0,734	0,784	0,751	0,766
X1.5	0,790	0,732	0,740	0,815	0,785
X1.6	0,765	0,721	0,890	0,750	0,759
X1.7	0,740	0,864	0,839	0,751	0,799
X2.1	0,720	0,753	0,740	0,769	0,743
X2.2	0,841	0,744	0,741	0,764	0,758
X2.3	0,727	0,743	0,724	0,896	0,722
X3.1	0,772	0,766	0,721	0,876	0,746
X3.2	0,712	0,765	0,844	0,744	0,744
X3.3	0,744	0,763	0,764	0,712	0,758
Y1.1	0,719	0,712	0,765	0,741	0,782
Y1.2	0,876	0,704	0,793	0,724	0,775
Y1.3	0,733	0,809	0,719	0,704	0,898
Y1.4	0,743	0,762	0,794	0,746	0,739
Y1.5	0,754	0,744	0,767	0,714	0,819
Y1.6	0,751	0,808	0,756	0,736	0,797
Y2.1	0,831	0,756	0,722	0,860	0,811
Y2.2	0,837	0,803	0,795	0,813	0,808
Y2.3	0,804	0,815	0,809	0,876	0,802

Source: Data processed, 2024.

All Cronbach's alpha and Composite reliability values on each variable are greater than 0.70. Thus it can be stated that the data in the study is reliable.



Table 12 – Cronbach's alpha & Composite Reliability Result

Variable	Cronbach's Alpha	Composite Reliability
Welfare	0,765	0,864
Working capital	0,807	0,858
Experience	0,763	0,821
Productivities	0,823	0,871
Technology	0,794	0,785

Source: Data processed, 2024.

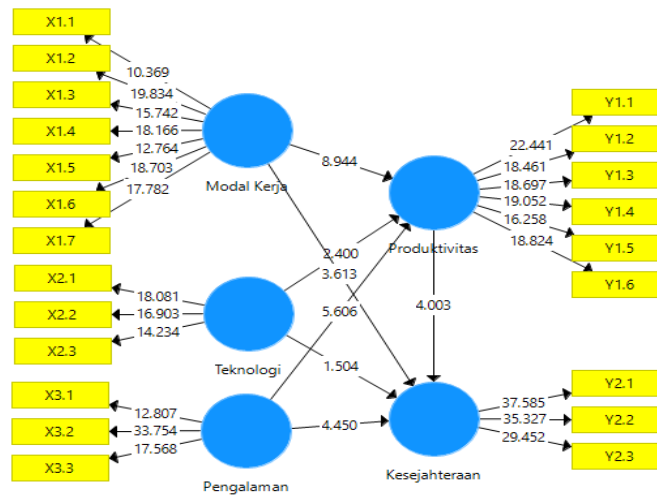


Figure 2 – Inner Model (Source: Data processed, 2024)

Table 13 – R-square Result

Variable	R Square	R Square Adjusted
Welfare	0,651	0,644
Productivities	0,691	0,687

Source: Data processed, 2024.

The R-squares value for the productivity variable (Y1) is 0.691 which indicates that it has a strong influence. The R-square value for the welfare variable (Y2) is 0.651, which indicates that it has a strong influence.

Table 14 – Hypothesis Test Results

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ((O/STDEV))	P Values
Working Capital → Productivity	0,369	0,373	0.059	8.944	0.000
Technology → Productivity	0,080	0,077	0.048	2.400	0.017
Experience → Productivity	0,198	0,199	0.051	5.606	0.000
Working Capital → Welfare	0,170	0,172	0.068	3.613	0.000
Technology → Wellbeing	0,086	0,090	0.057	1.504	0,092
Experience → Wellbeing	0,184	0,185	0.060	4.450	0.000
Productivity → Wellbeing	0,219	0,217	0.079	4.003	0.000

Source: Data processed, 2024.

The beta value is 0.369 and the t statistics value is 8.944 with a p-value of 0.000 < 0.05, so it can be concluded that working capital (X1) has a positive and significant effect on productivity (Y1). The results of this research are by the theory expressed by Firdaus (2012) that capital is all forms of wealth that can be used directly or indirectly in the production process to increase output. Capital is also a production input needed by fishermen in carrying out the production process, but apart from physical and human capital, social capital as something that summarizes all forms of fishermen's cooperation is also a determinant for increasing farmer productivity (Aressi, 2017). Capital is one of the production factors used to carry out a production process. This statement is supported by research results by Bintang



(2022), showing that there is a positive influence of capital on labour productivity. Research conducted by Mahayasa (2018) shows that capital has a positive and significant effect on productivity.

The beta value is 0.170 and the t statistics value is 3.613 with a p-value of  $0.000 < 0.05$ , so it can be concluded that working capital (X1) has a positive and significant effect on welfare (Y2). The results of this research are by the statement from (Autio et al, 2004) that technology refers to someone active in developing new technological knowledge in research institutions. The use of technology is associated with labor productivity. The more effective the use of technology, it is assumed that the capacity or amount of production will increase, so that labor income will increase because the capital factor used is raw materials. This statement is supported by research results by Nurfiat (2018), showing that technology has a positive effect on work productivity. Research from Rahmawati (2018) shows that technology has a positive and significant effect on productivity. Research from Wijaya (2018) shows that technology has a significant effect on labor productivity. Research conducted by Mahayasa (2018) shows that technology has a positive and significant effect on productivity.

The beta value is 0.080 and the t statistics value is 2.400 with a p-value of  $0.017 < 0.05$ , so it can be concluded that technology (X2) has a positive and significant effect on productivity (Y1). The results of this research are to the statement from (Autio et al, 2004) that technology refers to someone active in developing new technological knowledge in research institutions. The use of technology is associated with labor productivity. The more effective the use of technology, it is assumed that the capacity or amount of production will increase, so that labor income will increase because the capital factor used is raw materials. This statement is supported by research results by Nurfiat (2018), showing that technology has a positive effect on work productivity. Research from Rahmawati (2018) shows that technology has a positive and significant effect on productivity. Research from Wijaya (2018) shows that technology has a significant effect on labor productivity. Research conducted by Mahayasa (2018) shows that technology has a positive and significant effect on productivity.

The beta value is 0.086 and the t statistics value is 1.504 with a p-value of  $0.092 > 0.05$ , so it can be concluded that technology (X2) has a positive and insignificant effect on welfare (Y2). The results of this research are not by the statement from Sastrawidjaya (2012), that the more sophisticated the technology and fishing equipment used by fishermen, the more productivity will increase, thereby increasing production, and the community will achieve a higher level of welfare. The results of this research are also not in line with the results of Hartati's (2017) research, showing that technology affects welfare. Research results from Mahayasa (2019) show that technology has a positive effect on welfare.

The beta value is 0.198 and the t statistics value is 5.606 with a p value of  $0.000 < 0.05$ , so it can be concluded that work experience (X3) has a positive and significant effect on productivity (Y1). The beta value is 0.184 and the t statistics value is 4.450 with a p value of  $0.000 < 0.05$ , so it can be concluded that work experience (X3) has a positive and significant effect on welfare (Y2). The results of this research are by the statement (Rofi 2012) that work experience is a person's main capital to enter a certain field where the higher the intensity of a fisherman's work experience, the more productive a fisherman will be. This question is supported by the results of research by Norlinda (2021) which states that work experience has a positive effect on the welfare of fishermen. Research from Putra (2019) shows that work experience has a positive effect on fishermen's welfare. Widiana's research (2019) shows that work experience has a positive effect on workers' income. Research from Muliani (2022) shows that work experience has a positive effect on the welfare of fishermen.

The beta value is 0.219 and the t statistics value is 4.003 with a p value of  $0.000 < 0.05$ , so it can be concluded that productivity (Y1) has a positive and significant effect on welfare (Y2). The results of this research are in line with research conducted by Kusumayati (2018) showing that production factors have a positive effect on the welfare of fishermen in Jembrana Regency. Research from Widyastuti (2017) shows that worker productivity has a positive and significant influence on family welfare.

The effect of working capital on fishermen's welfare which is mediated by productivity is significant with a t-statistic value of  $3.213 > 1.96$ , this means that productivity acts as a partial



mediation, which means that in the relationship between variables there is a direct and indirect relationship (Garson, 2016). The results of this research are by the statement (Wijaya, 2016) stating that capital is also several factors that influence productivity. If the greater the capital used in the production process, the amount of output issued will increase, conversely the lower the capital used, the output produced will be lower which is related to the management of production factors in such a way that the output produced is by consumer demand for both quality and price.

Table 15 – Specific Indirect Effects

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ((O/STDEV))	P Values
Working Capital -> Productivity -> Welfare	0,112	0,122	0.068	3.213	0,020
Technology -> Productivity -> Prosperity	0,092	0,099	0.057	2.354	0,041
Experience -> Productivity -> Welfare	0,265	0,266	0.048	3.316	0,036

Source: Data processed, 2024.

The influence of technology on fishermen's welfare which is mediated by productivity is significant with a t-statistic value of 2,354 > 1.96, this means that productivity acts as a partial mediation, which means that in the relationship between variables there is a direct and indirect relationship (Garson, 2016). This condition means that the better the use of technology, the more fishermen's productivity in catching fish will increase, and increasing the productivity of fishermen in catching fish will indirectly improve the welfare of the fishermen themselves. This is reinforced by the theory. According to Imron (2013), fishing gear technology influences their operational cruising capabilities. Acheson (2001) states that fishermen have a high dependence on fishing equipment technology, the more modern the technology, the more productive and more catches there are so that it fulfills the welfare of the fishing community itself.

The effect of working capital on fishermen's welfare which is mediated by productivity is significant with a t-statistic value of 3.213 > 1.96, this means that productivity acts as a partial mediation, which means that in the relationship between variables there is a direct and indirect relationship (Garson, 2016). The results of this research are by the statement (Wijaya, 2016) stating that capital is also several factors that influence productivity. If the greater the capital used in the production process, the amount of output issued will increase, conversely the lower the capital used, the output produced will be lower which is related to the management of production factors in such a way that the output produced is by consumer demand for both quality and price.

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## CONCLUSION AND SUGGESTIONS

Based on the discussion that has been carried out, it can be concluded as follows. Working capital, technology and work experience have a positive and significant effect on the productivity of fishermen in Melaya District, Jembrana Regency. This means that the better the working capital, the better the technology used and the better the fishermen's work experience, the greater the productivity of fishermen in Melaya District, Jembrana Regency.





Working capital, technology and work experience have a positive and significant effect, while technology has a positive but not significant effect on fishermen's welfare. Productivity has a positive and significant effect on welfare. This means that the better the working capital, work experience and productivity of fishermen, the greater the welfare of fishermen, while the better the application of technology does not have a significant effect on the welfare of fishermen in Melaya District, Jembrana Regency. Working capital, technology and work experience indirectly have a significant effect on fishermen's welfare through productivity in Melaya District, Jembrana Regency.

Based on the conclusions that have been described, the following suggestions can be given. Working capital is still in an unproductive condition and there are still fishermen who are not prosperous. The condition of the ships/boats/boats requires capital maintenance costs and is often damaged so that fishing cannot be maximized, there are still traditional fishing equipment such as boats that do not have engines and the use of fish detection equipment provided by the Jembrana Marine and Fisheries Service is not used optimally due to lack of knowledge of use, ship/boat/boat engines are damaged and need to be repaired, cooling equipment because they don't have a cooler to store fish, fuel, difficulties in finding diesel/fuel, still using boxes filled with ice cubes to preserve fish, food ingredients because It is difficult to meet food needs when you don't get fish. Technology does not have a significant effect on productivity, where the government in Jembrana Regency, when assisting with fish detection equipment and modern technological equipment, must provide regular assistance to fishermen because they do not understand their proper use. So that fishermen are not productive and their income is not optimal, causing poor fishermen welfare. Work experience due to old age and health factors, the level of knowledge and skills possessed is still not yet developed in the use of modern equipment which is less than optimal due to just learning to use tools and mastery of work and equipment because he is new as a fisherman replacing his parents so mastery of the fisherman's job and equipment is still in groups with other fishermen. In this case, the government must provide education to fishermen and assist fishermen who are no longer productive.

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