

Socio-economic conditions of small-scale traditional fishermen: a case study in Payum Village, Merauke District, Papua, Indonesia

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ABSTRACT

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Fishermen in Payum Village are classified as small-scale traditional fishermen and live in the coastal area of Merauke Regency. Their livelihood depends on the season of fish and shrimp, which causes uncertain income. This study aimed to identify the socio-economic conditions and welfare of local fishermen and non-local fishermen communities in Payum Village, Merauke Regency. The research used a qualitative descriptive analysis method supported by analyzing costs, income, and community welfare. The analysis of the social aspects of the education level of fishermen's families included in family dependents above 70% follow compulsory education, i.e., elementary, junior, and senior high school as well. In addition, the fishermen received services from the community health centers (Puskesmas) with free health costs for first aid if they were getting sick. At the same time, in the economic aspect, the capital used was human capital and simple fishing gear such as drag nets. The income of local fishermen from capture fisheries and shrimp per month was IDR 6,268,991/month, and the income of non-local fishermen per month was IDR 5,340,403/month. The results of the analysis of the welfare level of local and non-local fishermen using the Fishermen's Exchange Rate (FER) analysis obtained FER values >1 were 1.13 and 1.48 for local and non-local fishermen, respectively. The study results concluded that the level of life of local and non-local fishermen in Payum village was at a good level of welfare and could have the opportunity to save money to meet secondary and tertiary needs.

INTRODUCTION

Indonesia is one of the maritime countries that is surrounded by vast oceans and has many islands and territorial waters that are very wide than the land area; this makes the potential for fisheries in Indonesia quite prominent in the welfare of the lives of coastal communities who depend on marine potential (Hanum, 2018). Moreover, abundant marine product resources should make coastal communities have a prosperous life (Fatmasari, 2014).

Merauke Regency is one area in Papua with many coastal communities; almost all of them are fishermen. Merauke Regency is located in the Southern Region of Papua Province and is

located in the easternmost part of Indonesia, which has a water area of about 5,089.71 km² and a relatively long coastline of 677.96 km² (BPS Kabupaten Merauke, 2020b; Dinas Perikanan Merauke, 2019). The number of coastal communities who work as fishermen is spread over 20 districts in Merauke Regency with 16,896 people where the majority of coastal areas come from local fishermen dominated by the indigenous Merauke tribe, namely the Marind Tribe. The Department of Maritime Affairs and Fisheries data for 2019 showed that the number of Papuan People (local) and non-local fishermen were 3,244 and 1,518 people, respectively (Dinas Perikanan Merauke, 2019).

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In Merauke District, there are four coastal areas, i.e., Lampu Satu, Payum, Ndalir, and Nasai Beaches. All people in that area work as fishermen (BPS Kabupaten Merauke, 2020a). Fishermen in Payum village consist of local and non-local fishermen. Non-local fishermen are fishers from outside the island of Papua who come to wander and live in Payum Village. Social

and economic issues in eastern Indonesia have always been exciting issues to be discussed and the attention of the central and local governments. The social and economic gap between local and non-local fishermen can be seen from the house and the community's ability to meet the needs of primary, secondary, and tertiary fishermen.

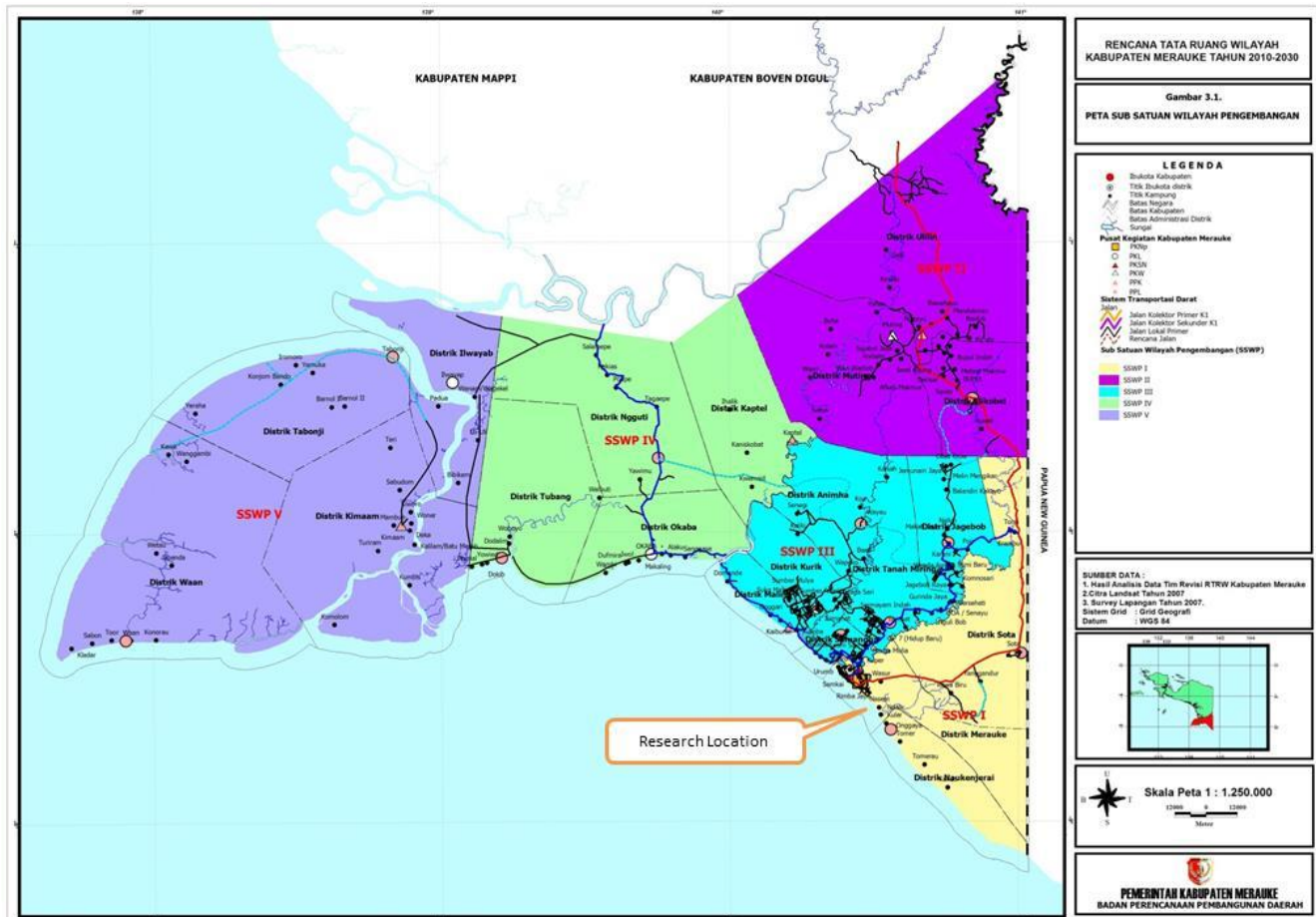


Figure 1. Research location in Payum Village, Merauke District, Merauke Regency, Papua (Bappeda Merauke Regency, 2011)

The Payum Coastal community is dominated by traditional fishermen and catches marine products using fishing nets as the primary fishing gear without using infrastructures such as motorboats in quantity and quality of marine fishing technology and human resources. The abundant potential for marine product production is not enough to illustrate that fishery activities in the area will run well if the limited quality and quantity of marine product capture technology and human resources are factors that can hinder the success of fisheries development in an area (Daeli et al., 2020). In addition, there is a risk of facing climate change scenarios that can affect fishermen's catches because of the growing wave season and often erratic weather changes that cause fishermen to be unable to go to sea to catch

fish. The impact of climate change cannot be ignored anymore; Merauke is one of the areas that contribute carbon emissions, namely the mangrove forest area that is used for residential areas or damaged by tidal waves (Untari et al., 2020; Untari et al., 2018a; Untari et al., 2018b). This study aimed to identify socio-economic conditions and the welfare of local and non-local fishermen in Payum Village, Merauke District. The results of this study are expected to be information for interested parties in the coastal area development program in improving the welfare of fishermen in the coastal area of Merauke. So far, no in-depth studies have analyzed the welfare level of sea fish fishermen whose production is seasonal.

MATERIALS AND METHODS

Location and source of research data

This research was carried out in 3 months, from February to May 2021, in Payum Village, Samkai, Merauke District, Merauke Regency. The sample size of this study was 148 traditional fishermen, consisting of 119 local fishermen and 29 non-local fishermen. Determination of the sample on local fishermen was carried out using a purposive technique by taking 25% of the total population (Arikunto, 2002) of local fishermen as many as 30 respondents and determining the sample for non-local fishermen using the census technique by taking all non-local fishermen as many as 29 respondents. So, the total sample of respondents in this study was 59 respondents from traditional fishermen. The research location is shown in Figure 1.

The data collected consisted of primary and secondary data. In this study, the primary data were obtained directly from fishermen from interviews using questionnaires and information in the field. At the same time, the secondary data were obtained from relevant agencies such as the Merauke Regency Fisheries Service in 2019 and data and information from the village government. The type of questionnaire in this research was open-ended questions. The research

questions used to answer the research objectives include:

1. Social aspects: education (family education level and costs for fishermen's families), health (easy access to facilities and health costs for fishermen's families).
2. Economic aspects: capture fisheries business system in Payum Village community; costs, income, and profits of fishing fishermen.
3. Aspects of fishermen's welfare: fishermen's income from fishery and non-fishery businesses, level of expenditure on fishery and non-fishery businesses (family consumption expenses).

Data Analysis

The data processing technique of this study used qualitative descriptive analysis to see how the socio-economic conditions of local and non-local fishing communities in Payum Village and to see the costs, revenues, incomes, and welfare levels of local and non-local fishermen. In addition, qualitative descriptive data analysis, to strengthen the social and economic phenomena of the fishing community in the field, was used to measure the level of fishermen's welfare using the Fishermen's Exchange Rate (FER) analysis (Basuki et al., 2001).

Table 1. Education level of fishermen's families

No	Education Level	Total		Percentage (%)	
		Local	Non-local	Local	Non-local
1	School age children but not in school	2	-	2	-
2	Child's age not yet school	4	2	5	4
3	Kindergarten	-	2	-	4
4	Primary school	44	21	49	36
5	Middle school	18	13	20	22
6	High school	20	17	23	29
7	College	1	3	1	5
Total		89	58	100	100

RESULTS AND DISCUSSIONS

The social condition of Payum Coastal fishermen's community

The local people who live in Payum Village are the Marind tribe from Wambi Village, Okaba District, Merauke Regency, Papua. The local fishermen are not part of the community holding the *ulayat* rights (customary communal land rights) of Payum Village. The primary purpose of the local community to migrate to Merauke Regency was to continue their education to the high school level. However, the education that did not finish until high school was due to the

cost factor, so the local fishing community became fishermen. Meanwhile, non-local people living and working as fishermen in Payum Beach came from Sulawesi Island, namely the Sulawesi Tribe. The purpose of their arrival was to migrate in the hope of fulfilling and improving economic life. The social life of the people in Payum Beach was well established; it was proven that the local community knows how to make nets because they mingle with non-local communities and also in catching marine products, there were no restrictions on access between local and non-local fishermen in catching fish in the waters along the Payum coast. The origin of different

regions and cultures will become the community's social capital in adapting to environmental changes that can affect the family economy of communities in coastal areas (Bott et al., 2020).

The social conditions of traditional fishermen in Payum Village, when viewed from the level of family education, indicated that the education level of local fishermen was relatively better, namely 34% of the education level was junior high school, compared to the education level of non-local fishermen who only finished elementary school, which was only 29%. Meanwhile, data on the education of fisherman family members who were heads of families are presented in Table 1.

Table 1 shows that the education level of fishermen's families was dominated by elementary school education, for local fishermen as many as 44 people or 49% and non-local fishermen as much as 21% or 36%. Awareness of the importance of fishermen's family education can be seen from the education level of fishermen's children from kindergarten to university level. Through education, fishermen hope to change the fate of the lives of their next generation. Moreover, the education of fishermen's children hopes to change the fate of their next generation's lives since the education of fathers and mothers of fishermen's families has low education (Muflikhati et al., 2010).

The health service facilities for the fishermen community in Payum Village were

adequate. There was a community health center (Puskesmas) that fishing communities can access and without any cost for health because public health services were free. People who seek treatment were provided with a health card brought during a health check at the Puskesmas. If the community experiences illness that could not be treated at the Puskesmas, a referral was made to a regional general hospital. However, some people used traditional medicine systems inherited from their ancestors without any medical treatment. In addition, some people also sometimes only bought medicine at the store to treat pain that they think can be overcome with medicine from a shop or pharmacy. Therefore, when viewed from the social aspect, one welfare indicator was the health sector with the ability to access health facilities, such as Puskesmas or regional general hospitals. The fishermen in coastal areas were already prosperous because people in Merauke and fishermen primarily hold health cards to get health services. So fishermen's income was more dominantly used to meet the family's basic needs, i.e., food (Muflikhati et al., 2010). In addition to food, fishermen's income was used to purchase cigarettes, betel nut, school children's pocket money, and alcoholic beverages (non-local fishermen).

The social aspect in terms of family responsibilities of the fishing community in the Payum Coastal coast can be seen in Table 2.

Table 2. Status and number of dependents of fishermen's families

No	Status	Fishermen (people)		Percentage (%)	
		Local	Non local	Local	Non local
1	Wife	30	29	24	33
2	Child	89	58	72	67
3	Parents	5	-	4	-
Total		124	87	100	100

Table 2 shows that local fishing communities and non-local fishermen on the Payum Coast had different dependent statuses based on data; local fishermen carried their parents, children, and wives while non-local fishermen only carried their wives and children. The most dependents of fishermen's families were fishermen's children who had attended school on average, local fishermen were 89 people or 72%, and non-local fishermen were 58 people or 67%.

The economic condition of Payum Coastal communities

The main economic activity of the Payum Coastal fishing community was working as traditional

fishermen, which was their primary job. The adequate time for fishermen to carry out the fishing business was only nine months a year, from March to November, while in the next three months, December-March, due to unfavorable weather, the cessation of fishing activities had an impact on reducing fishermen's income. Unskilled laborers in the city to meet the needs of their families and for non-local fishermen, the savings from catches, opening kiosks, and assistance from children of fishermen who were already working.

Capital is one economic aspect that is an essential component in fishing activities (Ridha, 2017). In Payum Village, the capital used by local fishing communities or non-local fishermen was

their capital or assistance from the government in nets and human capital. In fishermen communities, their workforce was required to have the ability and skills to catch marine products.

The fishing business carried out by fishermen in Payum Village was still managed traditionally on a household scale (Wasak, 2012). The fishing gear used by fishermen in the village was generally a drag net with an average net ownership per fisherman family of 4-8 reels. The fishing process by traditional fishermen was performed alone and did not use labor carried out along the coast. Therefore, the fishing season on the Merauke coast was highly dependent on wind, weather, wave height, and tides (Wasak, 2012). The nets were used in fishing nets and

shrimp nets with varying sizes consisting of 1 mesh net, 1 1/2 eye net, 1 1/4 eye net, two eye net, and 1 1/2 eye net. In terms of net maintenance, which was the most important thing, the materials used were purchased in bulk, consisting of rope IDR 50,000/roll, tin IDR 60,000/roll, nylon IDR 15,000/roll, and floats IDR 17,000/pack.

The study results showed that fishermen's income from fishing businesses was influenced by the productivity of fishermen (Ridha, 2017). The average fixed costs incurred by fishermen in running a fishing business using drag nets on the Payum Coast include equipment depreciation costs. The average fixed costs can be seen in Table 3.

Table 3. Average fishing business costs

Description	Fishermen	
	Local	Non-Local
Fixed cost		
a. Tool shrinkage (IDR ¹ /month)	774,208	907,397
Variable cost		
a. Labor (IDR/month)	387,593	385,441
b. Nets maintenance (IDR/month)	281,533	296,897
Total (IDR/month)	1,443,334	1,589,734

¹ \$1 USD = 14,500 IDR

The depreciation cost of the equipment is the cost obtained from the calculation of the cost of the equipment less the residual value divided by the economic life of the equipment in question. The fishing gear used to catch fish was a net. Based on Table 3, the depreciation costs of equipment incurred by non-local fishermen were much higher than those of local fishermen, because the number of fishing gear, namely nets used by non-local fishermen, was much higher, and maintenance was carried out regularly. At the same time, the variable costs of fishermen in carrying out fish and shrimp catching businesses using drag nets on the Payum Coast included labor costs and nets maintenance. In the variable costs for labor, it can be seen that local fishermen had higher costs than non-local fishermen because the number of days local fishermen catch is much higher. Therefore, the cost of capture fisheries production was strongly influenced by the production facilities or production factors used by fishermen, affecting income (Iry & Sabon Rain, 2020; Ridha, 2017).

The income of fishermen by running a fish and shrimp catching business using a drag net is the difference between the income and the costs incurred while running a fish and shrimp catching business using a pull net. The average income of local fishermen and non-local

fishermen in Payum can be seen in Table 4. Based on Table 4, the average income, local fishermen's income for fish production was IDR 19,045,000 and shrimp for IDR 58,359,333. Therefore, the total revenue per year was IDR 77,404,333/season/year, and the monthly income for fish was IDR 6,450,361.

Thus, fishermen's income was the difference between fishermen's income and the total cost. The annual income received by local fishermen was IDR 75,960,999/season/year and a monthly income of IDR 6,289,991/month. The income of non-local fishermen on fish production was IDR 17,798,276 and shrimp for IDR 48,406,207. The total revenue per year was IDR 66,204,483/season/year, for the income received by non-local fishermen was IDR 64,614,749/season/year and a monthly income of IDR 5,340,403/season/year. The cost of production factors strongly influences the income of agricultural farmers in Merauke, which also occurs in non-fishery factor costs (Untari, 2011). In addition, the income of fishermen was influenced by the number of catches of fishery products which were influenced by the season (Muflikhati et al., 2010). However, the income of farmer fishermen in Payum Village can still be increased by implementing fish processing strategies so that the selling value increases and

adds value to the product so that the fishermen's income increases. In addition, because the fish production season is not always high, alternative sources of income are needed for the community, such as the cultivation of tubers which can

generally be planted in the yard and are easily cultivated, as well as other agricultural businesses that have the potential to be developed according to the region (Angga et al., 2019; Untari & Herdjiono, 2019, 2020).

Table 4. Average revenue, costs and income of local and non-local fishermen on the Payum Coast.

Indicator	Fishermen's			
	Local		Non Local	
	Fish	Shrimp	Fish	Shrimp
<i>Production</i>				
Hight Production (March-June) (Kg/season)	1440	1420	1361	1180
Low Production (July-November) (kg/season)	310	173	279	142
<i>Price/unit</i>				
Hight Production (IDR/kg)	10,000	35,000	10,000	35,000
Low Production (IDR/kg)	15,000	50,000	15,000	50,000
<i>Income</i>				
Hight Production (IDR/season/year)	14,400,000	49,709,333	13,613,793	41,285,517
Low Production (IDR/season/year)	4,645,000	8,650,000	4,184,483	7,120,690
Total income (IDR/season/year)	19,045,000	58,359,333	17,798,276	48,406,207
Income (IDR/season/year)		77,404,333		66,204,483
Average income (IDR/month)		6,450,361		5,517,040
<i>Cost</i>				
Fixed cost (IDR/season/year)		774,208		907,397
variable cost (IDR/season/year)		669,126		682,337
Total cost (IDR/season/year)		1,443,334		1,589,734
Average cost (IDR/month)		60,370		176,637
<i>Revenue</i>				
Revenue/season/year		75,960,999		64,614,749
Revenue/month		6,289,991		5,340,403

Fishermen welfare level

Fishermen's exchange rate compares fishermen's income and fishermen's expenditure in a certain period to see the level of fishermen's welfare. Table 5 shows that the value of FER for local fishermen and non-local FER was >1. The FER value for local fishermen was 1.13, and the FER value for non-local fishermen was 1.48. It showed that the lives of local and non-local fishermen on the Payum Coast had a reasonably good level of welfare to meet subsistence needs and had the potential to meet their secondary or tertiary needs, or even save (Yapanani et al., 2013). The FER of non-local fishermen was much greater than the value of the FER of local fishermen. Local fishermen had a much higher total fisherman's income (Yt) and fisherman's total expenditure for family consumption (EKt), where the total fisherman's income (Yt) reached IDR 6,941,472/month, which came from fishery

income and non-fisherman income from work as unskilled laborers with a wage of IDR 100,000/day. The consumption expenditure of fishermen's families on local fishermen was high. Their expenditure was reaching IDR 5,975,833/month because the local community was very consumptive of areca nut and the habit of meeting tertiary needs to support social life, which had been considered a culture and habit, spending on electricity, transportation, children's education costs, and other needs as well as household consumption spent in retail. Some of these things cause the value of FER for local fishermen to be lower so that local fishermen's ability to save was lower than non-local fishermen. The local fishermen's savings were used for household consumption needs during the low fish production season. In one month, local fishermen had the potential to saving money IDR 805,268/month. The welfare level of

non-local fishermen was much better than that of local fishing communities, even though the total income of fishermen from fishing businesses (YFt) was lower than that of local fishermen, which is IDR 5,517,040/month. However, it was supported by the high total non-fisherman income (YNFt) of IDR 771,241/month. The total non-fisherman income for non-local fishermen was from the effort to open a kiosk and the help of fishermen's children who give it every month. The total expenditure for family consumption (EKt) was much lower than local fishermen's, IDR 4,075,207/month. For consumption expenditures for fishermen's families consisted of consumption costs for fishermen's families,

electricity, transportation, children's education, and other needs. Like local fishermen, non-local fishermen could save short-term savings to meet family consumption needs and be considered urgent. Non-local fishermen in one month could save money IDR 2,037,438/month. The income of fishermen was influenced by the amount of fish caught. The fishing ability of fishermen will be better if it was accompanied by an increase in the technology used in the fishing, such as acoustic technology (Kurnia et al., 2015), solar panel technology (Widodo et al., 2020), as well as different bait technology using Bubu fishing gear (Amtoni et al., 2010).

Table 5. Exchange rate of local fishermen and non-local fishermen in Payum Village

No	Description	Fishermen	
		Local	Non Local
<i>Income</i>			
1	Fishermen's income from fishing business (YFt) (IDR/month)	6,450,361	5,517,040
2	Non-fishermen's income (YNFt) (IDR/month)	491,111	771,241
3	Total income of fishermen (Yt) (IDR/month)	6,941,472	6,288,282
<i>Expenditure</i>			
1	Fishery business expenses (Eft) (IDR/month)	160,370	176,637
2	Family consumption expenditure (Ekt) (IDR/month)	5,975,833	4,075,207
3	Total revenue (Et) (IDR/month)	6,136,204	4,251,844
<i>Fishermen's Exchange Rate (FER)</i>		1.13	1.48

Non-local fishermen in one month could save from fishing business compared to local fishermen because the management pattern or financial utilization, especially for family consumption, was quite good. The consumption costs of local fishermen's families were wasteful and had the principle that natural resources were abundant and can be taken at any time so that if they have excess income, they will be used to meet secondary needs which do not provide value. The habit of sharing and living in a community that was still accustomed to consuming alcoholic beverages caused fishermen or the head of the family to use their income to gather in the community and use the income to live extravagantly. The results of the FER value > 1 in local fishermen did not show the actual level of welfare when viewed from the standard of prosperous living, such as the status of homeownership and availability of toilets. None of the local fishermen in Payum Village had a legal or certified yard based on field observations. The status of the land they occupy was only the status of a use permit from the owner of the customary rights of the Marind Tribe, who had the rights to the customary land they occupy. Meanwhile, most of the houses they live in were assistance or had been built by the Merauke Regency government.

CONCLUSIONS

This study concluded that: first, in terms of the social aspects of the local and non-local fishermen. In terms of education, the fishermen's families had received a good education; for the health of the fishing community, they had been encouraged to take advantage of the existing auxiliary health centers because of their location in the middle of residential areas so that the community it was difficult to access free health services, and the majority of fishermen's families had school status. Second, based on the Fisherman's Exchange Rate (FER), the fishermen's welfare level had a FER value > 1, where the FER value of local fishermen was 1.13, and non-local fishermen were 1.48. So that fishermen's families could meet their secondary or tertiary needs and set aside money for savings. Local fishermen in one month could save IDR 805,268/month, while the ability to save for non-local fishermen was IDR 2,037,438/month.

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