The contribution of seaweed farmer's wife to household income at Kupang Regency, Indonesia

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Abstract. Seaweed is a commodity that has high potency to be developed in west Kupang district. The seaweed farming performed in this area is a household business which involves all family members. The farmer's wives are an important family member who have a significant role in the development of seaweed farming. The objective of this study was to identify the contribution of farmer's wives' income to the household. A survey method by using questionnaire was used for data collection. The respondents were chosen from three villages (Tabolong, Tesabela, Bolok) in west Kupang district. The results revealed that most seaweed farmer's wives were middle age woman with low level of education. Their income made for between 20-67% of the total household income. This is contributing to the high income of the seaweed farmer's household in the research area which is above the regional minimum wage of Kupang district. The factor that significantly determined the wives' workhours in seaweed farming is the income that they obtained. In spite of the wives' involvement in seaweed farming business, they still are taking the most responsability in raising children, but recently more husbands are involved with children raising responsibilities.
Key Words: coastal community, fisheries business, household income, seaweed farming, wives' role.

Introduction. Seaweed is a promising commodity which is included in the Indonesia fisheries revitalization program beside shrimp and tuna (Mira 2012). It is because seaweed has numerous advantages such as food source, cosmetics and medicinal ingredients, animal feed, organic fertilizer, and biofuel (Gomez-Zavaglia et al 2019). Recently, the development of alternative energy like biofuel had come under spotlight due to bad impacts of fossil fuels (Luque et al 2008). It is reported that 1 ha area of seaweed can produce 58.700 l/year of oil, while corn only 172 l/year and palm 5.900 l/year (Basmal 2008; Sunadji et al 2016). These are making the commodity to have a high market demand. However, from the 1.110.900 ha potential seaweed area in Indonesia, only 20% of it that had been utilized (Kambey et al 2020). Therefore, the status of seaweed cultivation in Indonesia is under developed. Further attempts can be made to increase seaweed contribution to inland revenue and community welfare (Damelia & Soesilowati 2016).

Kupang regency is in East Nusa Tenggara Province-Indonesia and is an islands region which has 26 km of coastline. Thus, this area has potential for seaweed cultivation development (Oedjoe et al 2018). Moreover, the seaweed production of Kupang regency is the highest among other regions in East Nusa Tenggara province. Meanwhile, the percentage of seaweed potential area utilization is below 15% (Tuwo et al 2020).

Seaweed cultivation in Kupang Regency is a household business. All family members play an active role in every stage of business activity, from preparing the cultivation area to marketing the product (Sunadji et al 2013). The wife is an important household member which takes key part in the business (Kruijssen et al 2018). In examining the role of a wife or woman in both farming and fisheries including seaweed cultivation, it is necessary to link it with women in general (Msuya & Hurtado 2017). Women are an inseparable part of national development which, among other things,

seeks to alleviate groups of people who are still living below the poverty line (Bastos et al 2009).

Women have been recognized to contribute in economically, especially in reducing poverty at household level (Fajarwati et al 2016). The variation of family characteristics may affect the productivity of wives in seaweed cultivation sector (Zamroni & Yamao 2011). Hence, the understanding of wife contribution to seaweed farming is essential to support strong household life as well as development in the marine sector, especially seaweed. However, past research regarding to this issue is limited. The aim of this study was to identify the contribution of seaweed farmer's wives' income to the household. This is to show how big the role of seaweed farmer's wives is to the improvement of family prosperity in Kupang regency.

Material and Method

Study area and data collection. This study used the survey method and took place in West Kupang district, Kupang regency (Figure 1). The data was collected from September to October 2020. The target population were the wives of seaweed farmers in the study area. The sample size was of 60 respondents from three villages in the district which are Tablolong (30 respondents), Tesabela (18 respondents), and Bolok (12 respondents).

Figure 1. Research location in West Kupang district, Kupang Regency-Indonesia
(Source with modification: ANU 2020).

Research variables. There were several research variables that were observed using the questionnaires. Some of them (along with their operationalization definition) are as follow:

- AGE: age of respondent (years).
- EDU: length of education taken by respondent (years).

- INCH: income of husband in which comes from seaweed farming, another fisheries sector, and non-fisheries sector (IDR x1000/month).
- INCWF: income of wife/respondent from seaweed farming (IDR x1000/month).
- TINCH: total income of household, that of the sum of INCH and INCWF (IDR x1000/month).
- SCHILD: number of school children in the household.
- WHRS: time allocation of respondent for seaweed farming (hour).
- TEXPH: total expenditure of the household (IDR x1000/month).

In addition, the contribution of seaweed farmer's wife to the household income is measured by the ratio of INCWF to TINCH.

Data analysis. We used multiple linear regression to identify the factors affecting time allocation of respondents for seaweed farming. The data analysis was conducted by using the software PAST version 4.03.

Results and Discussion

From Figure 2, most of the respondents were early and late middle-aged women (age of 40-50 years and 50-60 years), and a high number of them experienced education for six years. Meaning that the respondents were mostly elementary school graduates. Many coastal cultures subscribe to an education that is focused on experiences in life. Formal education in coastal communities is highly limited and sponsored by less insufficient services, leading to a low quality of education in coastal communities (Rakib 2015). Thus, the poverty rate of Indonesian coastal communities, most of them with low education, has reached quite a high rate (Cahaya 2015).
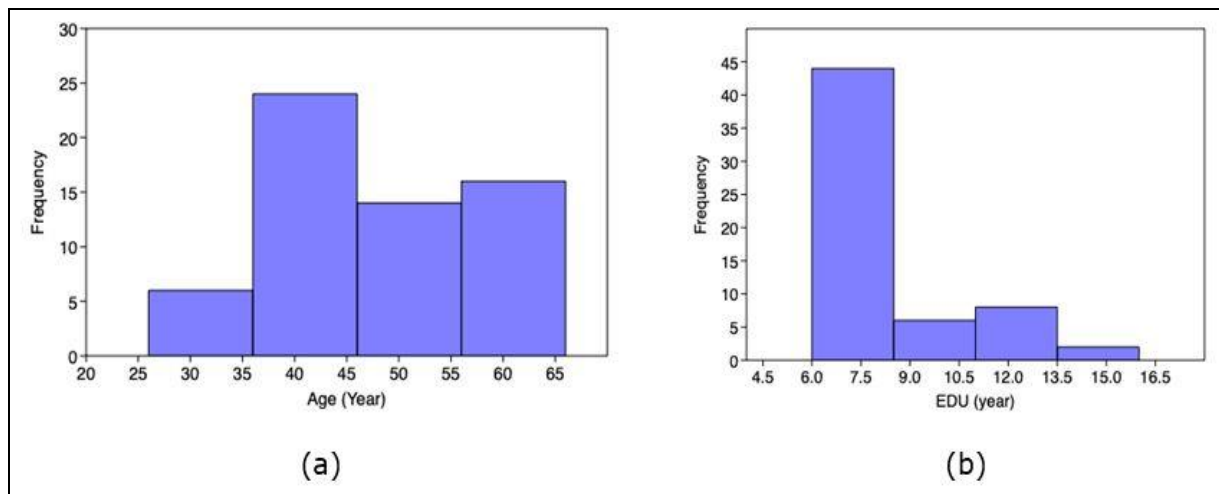

Figure 2. Age (a) and length of education (b) characteristics of the respondents.

Figure 3 depicted that monthly income of respondent's husband mostly ranged from IDR 1.500.000 to 2.000.000, while the wife income ranged from IDR 800.000 to 1.200.000. It showed that the husband's income is generally higher than that of the wife. On the other hand, the total income of the household was primarily at IDR 2.500.000 to 3.000.000. The number is quite large compared to regional minimum wage of Kupang district, which is valued at IDR 1.750.000. This may be caused by the fact that many farmers households greatly focus on seaweed farming, than other fisheries sectors, and that this business is well performed and gives good income (Irmayani et al 2015). Meanwhile, total expenditure of the household largely varied between IDR 1.000.000 to 2.000.000 per month. Therefore, the households can put some money aside.
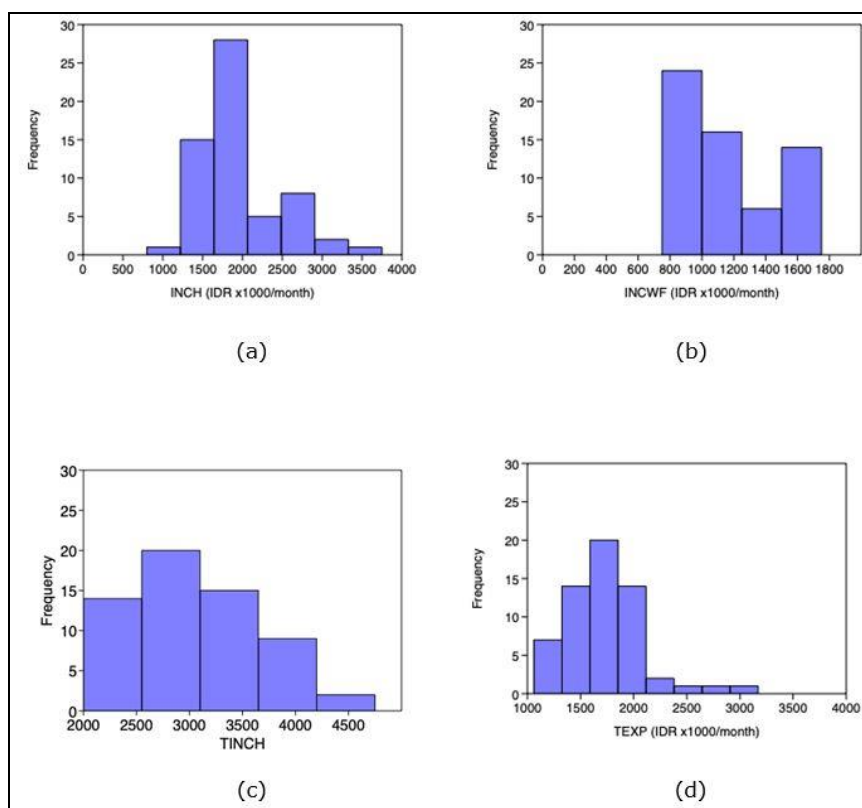
Figure 3. Distribution of income and expenditure of the seaweed farmer's household: (a) income of husband; (b) income of wife; (c) total income of household; (d) total expenditure.
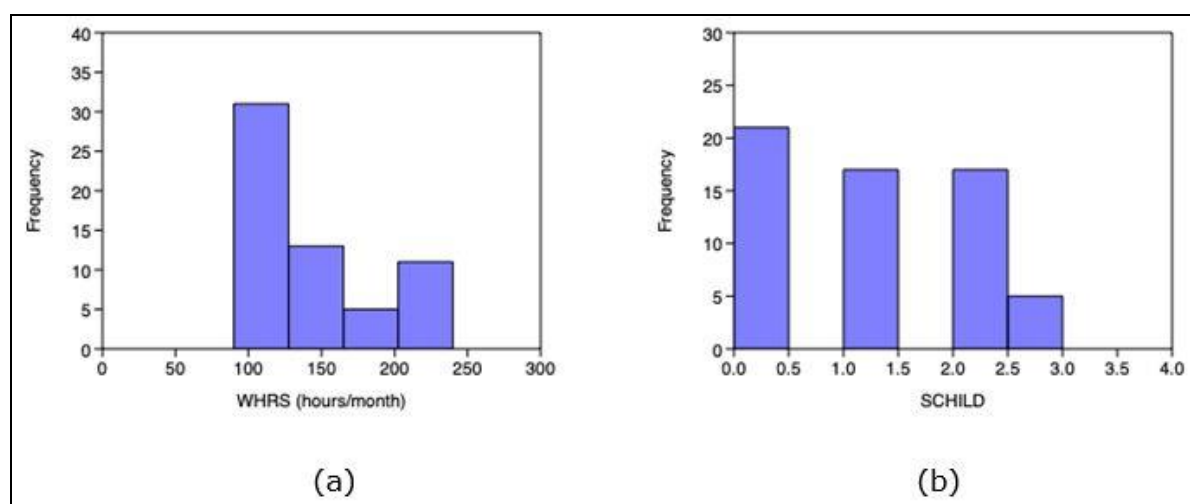

Figure 4. Work hours (a) and the number of school children (b) of the respondents.

Figure 4 showed that the respondents' work hours number was between 100 and 250 hours per month. This is equivalent to 3-8 hours per day. Meanwhile, many respondents have no school children (represented by the values from 0.0 to 0.5), while the rest have 1 to 3 school children. This is because the respondents were dominated by middle-aged women, and their children were no longer at school. Furthermore, low education level in coastal community resulted in many children leaving school early (Ferguson et al 2007).
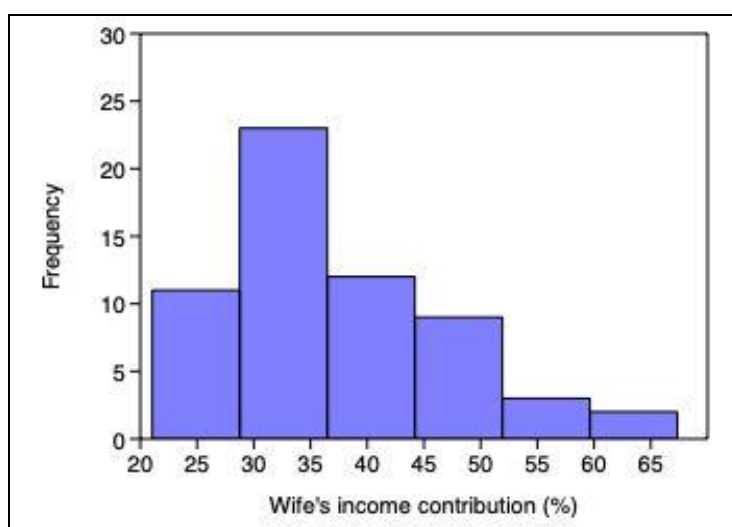
Figure 5. Seaweed farmer's wife's income contribution.

Figure 5 indicated that the contribution of wives' income ranged between 20 and 65 %, whereas the highest mode occurred at 30-35 %. However, this study also presented that there are some respondents who provide more than 50% of the household total income. Meaning that the wives have a great role for the family prosperity. Society roles can be categorized into three (3): reproductive, productive, or economic, and community management (Opoku-ware 2014). Two of the roles (productive and community management) are seen as crucial to reduce poverty in household level (Nadim & Nurlukman 2017). Productive means that the wives are involved in income generating activities. On the other hand, social roles represent joining religious or cultural meetings/ceremonies (Batoa et al 2016). Seaweed farmer's wives are motivated to do economic activities because of the urge to meet the household needs, make use of their skills, and responsibility to the family (Opoku-ware 2017).

Simultaneous role of seaweed farmer's wives affects their workhours. The following Table 1 showed that age (AGE), length of education (EDU), their income (INCWF), total household expenditure (TEXP) has positive effect to workhours. Meanwhile, husband income (INCH) and number of school children (SCHILD) have reverse impact. However, only wives' income (INCWF) had significant impact ($p<0.05$) to the response variable. This finding suggests that high income from seaweed farming is highly motivating wives to be deeply involved in this business, more than any other factors. New family trends and patterns have been paralleled by changes in gender roles, in which men's involvement in family responsibilities rose, mainly regarding the care for children (Oláh et al 2018). School children need more attention from their parents, especially mothers, but also their fathers (Hidayati 2016).

Table 1

Regression analysis of factors affecting seaweed farmer's wives' workhours

Variable	Coefficient	SE	T	P	Remark
Constant	9.9171	42.64	0.23258	0.81699	-
AGE	0.81269	0.51639	1.5738	0.12149	Not significant
EDU	2.4839	2.1406	1.1604	0.25109	Not significant
INCH	-11.172	8.8119	-1.2679	0.21038	Not significant
SCHILD	-0.62289	0.61951	-1.0054	0.31925	Not significant
INCWF	60.842	16.047	3.7914	0.00038532	Significant
TEXP	18.012	14.593	1.2343	0.22255	Not significant

Conclusions. Wives are seen to have great role in seaweed farming in West Kupang district. This research showed that their income made up for 30-35% of the total household income. They are characterized as middle aged women with a low level of education (six years of education) and 3-8 workhours per day. Many of the households have no school children, which shows that low education levels in coastal communities resulted in many children leaving school early. A statistical analysis in this study proved that wives' workhours in seaweed farming significantly affected their household income. Meanwhile, the other variables such as age, length of education, total expenditure, and number of school children were insignificant. In spite of the wives' involvement in seaweed farming business, their role in taking care of the children is still visible. The more school children they had, the less workhours they afforded. Recent family patterns also place men in the role of childcare and this gives women the possibility to afford more workhours.

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