

## Productivity and Feasibility of Lift-net Fishery in Kwandang

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### Abstract

The purpose of this study is to determine productivity and business feasibility of lift-net boat. The method used is a survey method with productivity and business feasibility analysis. The results showed that the lift-net boat productivity was 143.19 kg / GT. The feasibility of lift-net boats that lands their catch in the Kwandang Nusantara Fisheries Port (PPN) based on the Revenue Cost Ratio (R / C) value of 1.39; Payback Period (PP) 1.06 years or 1 year 22 days, and NVP + Rp. 301,768,360. This shows that lift-net boat fishery is feasible.

Keywords: productivity; feasibility; lift-net; fishery.

### Introduction

Capture fisheries is one way of utilization of marine resources that rely on marine services during the production process. In conducting the fishing effort, it is important to know whether the enterprise carried experiencing gains, losses or break even. To expedite fishing effort is necessary to do a feasibility study on fishing enterprises.

According to Subago (2005) in Suliyanto (2010), a feasibility study is an in-depth research on a enterprise idea about to be implemented. One of the fishing efforts often used by fisherman is lift-net enterprises. Lift-net is a mobile fishing equipment, moving around an area of fishing ground that relies on a platform boats and light fishing. The fishing effort has been widely utilized in Gorontalo society, especially in the north. North Gorontalo fishing community has long been conducting fishing enterprises that make use of lift-net which then landed their catch at NFP Kwandang. However, so far research on the enterprise carried on by the community not yet well known whether the enterprise suffered gain, loss or break even.

Based on research conducted by Takril (2008), about the enterprise of lift-nets boat in Polewali Mandar, West Sulawesi shows a feature of 'still relatively sustainable', with the results of the analysis of the feasibility of catching small pelagic fish with a lift-net obtained BEP production per year is Rp 40,473,338.97 with annual production volume of 28,663.67 tons. In connection with this, the authors conducted research on "Productivity and Feasibility Lift-net boat (boat lift net) fishing port that landed in the NFP Kwandang, North Gorontalo Regency". This

study is expected to provide information to fishermen about the appropriateness of the enterprise carried on at this time amid the problems of fuel oil (BBM) increasing costs.

### Research Methodology

The method used is a survey method. This research was conducted by collecting secondary data, which includes production data capture, Primary data includes interview data about the types of fish caught, the weight of the catch per trip, the value of the catch, investments, fixed costs, and operating costs for one unit of fishing gear boat lift-net. Interviews were conducted using data sampling method, which takes 10% of the total number of ship owner lift-nets boat that land catches in NFP Kwandang.

Production per trip (Catch per Unit Effort) boat lift-net is calculated based on the volume of catches and number lift-nets boat trip (CPUE), with equation (Saputra; et al, 2011). Productivity of lift-net is calculated in unit size of the boat (GT), with equation used in Saputra; et al, (2011). According to Effendi and Oktariza 2006, profit and loss analysis aims to determine the amount of gain or loss from the enterprise being managed. The analysis is Revenue Cost Ratio (R / C), Payback Period (PP), Net Present Value (NPV), and Break Event Point (BEP).

### Results and Discussion

#### Catch Productivity

Based on information obtained contained 47 lift-nets boat that landed catches in NFP Kwandang the catchment area in the Celebes Sea, especially in

waters of Tolinggula, Sumalata, Dunu, King Island, Monano, Poneo, Gentuma, Atinggola, and Buko. In general, the dominant fish caught are anchovy (*Stolephorus* spp), the oilsardine (*Sardinella longiceps*), kembung (*Rastrelliger* spp), layang (*Decapterus* spp), and others.

According to Takril (2008), the main fish catches for lift-net are anchovies (*Stolephorus* spp), mackerel (*Rastrelliger* spp) and layang (*Decapterus russelli*) so that other species classified as the result of by-catch. Fish catches by lift-nets boat from 2011 until 2013 landed at the NFP Kwandang namely fish alu-alu, Beloso, flatfish, tuna, lencam, peperek, mullet, mackerel, layang, lemuru, trevally, tembang, anchovies, tetengkek, tuna, squid, and other fish. More specifically the percentage of fish caught by lift-net boats can be seen in Figure 1.

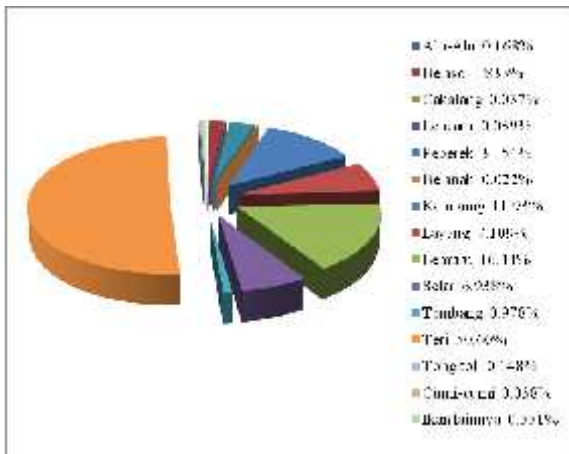


Figure 1 Percentage of the lift-net fishing boat. (Source: Secondary Data; June 2014)

Fish catches landed by lift-net boats in NFP Kwandang are very diverse, but there are some dominant fish species caught during the past three years, namely anchovy, oil sardine and mackerel. Based on data obtained from NFP Kwandang, the fish production show an increase in 2012 and 2013 compare to catch in 2011. However, in 2013 the production of the catch declined when compared to the year 2012. Where in 2011 the production of catch was 1,297,805Kg; in 2012 catch production was 2,280,738Kg; and in 2013 production was 2,149,557 kg. The development of the production of fish catches landed at the fishing port in Kwandang as found in Figure 2.

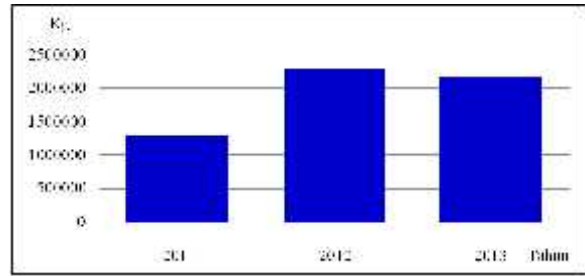


Figure 2 The development of the production of fish caught by lift-net boat

Based on production data capture above shows that an increase in the production of the catch in 2012, but in 2013 a decline in the production of fish catches. From interviews with the employers of lift-nets boat, among the causes that make production decreased are natural factors. The weather has begun unpredictable, whereas in general entrepreneurs of lift-net boats based their weather forecasts on knowledge passed down through generations. The occurrence of fluctuations in the amount of production from 2012 until 2013, allegedly by increase of number of lift-net enterprise so the number of effort (trip) increase which finally lead to crowded fishing in the fishing ground. When compared to the production of small pelagic fish catch in 2010 with a value of 384 750 tons and the views of the volume of catches of anchovy which is the main target of the lift-net boat with the figure 181 tons per year which caused the number of fishing fleet is still lacking and no increase from the year 2003- 2010, as well as the capture of the trip affected by weather conditions (Baruadi et al, 2012). This shows a decrease in the production of lift-nets boat catches from 2011 through 2013.

Trip or fishing effort carried out by fishermen in one day, from year to year showed increase. Trip of fishing carried out by fishing lift-net boats that land their catch in NFP Kwandang as found in Figure 3.

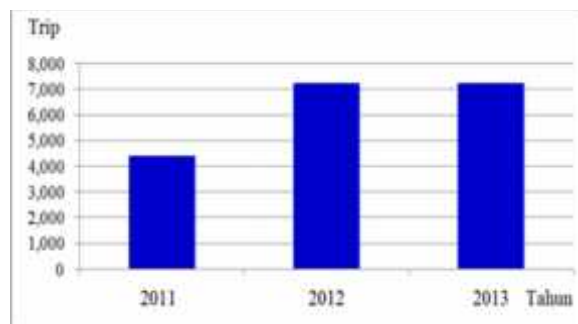


Figure 3 Trip fishing carried out by lift-net fishing boat

Based on data obtained from the fishing port Kwandang Archipelago showed that in 2011 there are

4,377 trips of fishing effort, 7,206 trips in 2012, and 8418 trips in 2013. When compared with the catch in the fishing unit in Polewali Mandar in the last ten years (1994-2003) the catch in Kwandang is increased with fluctuations. Fluctuations in the catch can be caused by several things, including the number and efficiency of fishing unit used by fishermen, duration of fishing operations, the abundance of fish to be caught as well as environmental conditions such as temperature, salinity, currents and precipitation (Takril, 2008).

The catch per fishing effort (CPUE) of lift-nets fishing boat that landed at NFP Kwandang does not settle or show a decline from year to year, which in 2011 CPUE reached 295.5 kg/trip. Followed by an increase in 2012 CPUE which reached 316.5 kg / trip, due to the increasing number of production and catching trip. 2013 CPUE reached 255.4 kg / trip, this value shows the deterioration in CPUE when compared to the year 2011 and 2012. As noted by Ssparred and Venema (1989) in Saputra, et al., (2011), CPUE is an index of abundance of fish stocks waters. From this description, when compared with the data CPUE above shows that there has been a decline in fish stocks in the catchment.

Based on data obtained from the port authority lift-net boats that land their fish at NFP Kwandang generally use a vessel with a capacity of 2 GT, so the productivity of lift-net boat is 0.143 tons / GT or 143.19 Kg / GT. If compared with the productivity of the tuna boat with a capacity of 50 GT or more, then the tuna longliner productivity is 0,045 tons / GT or 45 Kg / GT (Saputra., Et al, 2011). The catch per fishing effort CPUE in the NFP Kwandang as found in Figure 4.

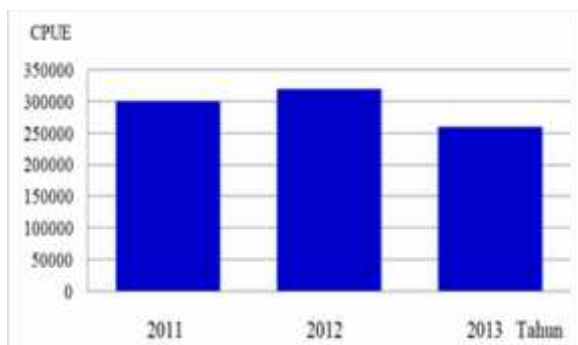


Figure 4 Catch per unit effort (CPUE)

#### Feasibility of Lift-net Boats

One factor is the ongoing management of economic factors, this means that the management of fish resources must be able to produce economic growth, capital maintenance, and use of fish

resources and investments efficiently. Based on this, the economic viability need to be considered. Economic feasibility used to estimate the economic value of a fishery enterprise and one of them is financial factors. Financial price adjustments made in order to illustrate the overall social value both for input and output to fishing (Baruadi, 2012). One financial analysis used in describing the worth of a enterprise lift-net of fisheries boat is to perform financial analysis and investment analysis. Financial analysis and investment analysis is also used in a previous study by Takril in his thesis in 2008 which took place in Polewali Mandar, West Sulawesi.

Analysis of fishing effort lift-net that analyzed includes financial analysis and investment analysis. Calculation of fishing effort lift-net analysis is only of fishing activities, so that the number of trips is calculated at the time to catch fish. Investment is the initial cost incurred to conduct enterprise. Financial analysis covering fixed costs and variable costs, while the investment analysis is the cost to do enterprise. Financial analysis covering fixed costs and variable costs, while the investment analysis is the cost to do enterprise.

Table 1 Costs required to lift-net a boat enterprise in one year

No	Analisis	Biaya yang Dibutuhkan	Satuan
1.	Investasi	129.170.000	Rupiah (Rp)
2.	Finansial	332.611.000	Tahun
	a) Biaya tetap	19.800.000	Tahun
	b) Biaya variabel	332.811.000	Tahun

Based on the results of interviews with the fishing boat that landed lift-net fish catch in the NFP Kwandang (Table 1), the investment costs incurred in an effort to an average lift-net boat is Rp. 129 170 000 consisting of lift-nets boat, boat towing or tow, the towing boat engines, fishing gear, the engine generator, and lights. While the financial costs incurred in an effort to lift-net a boat that is a fixed cost, which includes all costs to be incurred although not engage in fishing operations. Fixed costs incurred by entrepreneur into their lift-net boats averagely reached Rp. 19.8 million / year, which include the cost of boat maintenance, engine maintenance, maintenance of fishing gear, and light maintenance. Variable costs incurred by entrepreneur in lift-net boats averagely reached Rp. 290 466 000 / year, which includes the cost of diesel fuel, oil, fuel, crew wages, and supplies. Based on fixed costs and variable costs (variable costs), the total financial cost required for a enterprise lift-net of the average boat reaches Rp. 310 266 000 / year.

Of investment analysis and financial analysis of the total revenue that the entrepreneur of lift-net boats in one year, reaching Rp. 432 million / year, with fish catches obtained 400 kg / trip with an average selling price of Rp. 5,000 / kg and the average trip in one year to reach 216 trip. Revenue of lift-net enterprise is as found in Table 2.

Table 2 Revenue efforts of lift-net boat

Total Trip Tahun	Perkiraan		
	1 Trip (Kg)	Harga/Kg (Rp)	Pendapatan Tahun
216	400	5.000	432.000.000

According to Effendi and Otkariza (2006), fisheries done by an entrepreneur should generate sustainable profits. Therefore, it is necessary to determine the feasibility, the rate of profit, return on investment, as well as the break-even point. Feasibility analysis on a fishing effort is necessary given a considerable level of uncertainty, especially to fishing and processing of fishery products is strongly influenced by the fishing season.

Analysis on fisheries feasibility can be done by several methods. The method used in calculating the worth of a enterprise's fisheries lift-net of the boat that

landed the fish at NFP Kwandang i.e. Profit / loss analysis, Revenue Cost Ratio (R / C), Payback Period (PP), Net Present Value (NPV) and Break Event Point (BEP). Results of enterprise analysis of lift-net boat that land their catch at NFP Kwandang are as found in Table 3.

Table 3 Analysis of Profit / loss, R / C, PP, NPV and BEP.

Tabel 3. Hasil analisis usaha bagan perahu

No	Analisis Usaha	Biaya Hasil Analisis	Satuan
1.	Laba rugi	121.734.000	Rupiah (Rp)
2.	Revenue Cost Ratio (R/C)	1,39	Luwak
3.	Payback Period (PP)	1,06	Tahun
4.	Net Present Value (NPV)	-561.758.360	Rupiah (Rp)
5.	Break Even Point (BEP)		
	BEP Produksi	62.033,2	Kg
	BEP Harga	3.591	Rupiah (Rp)

### Conclusion and Suggestion

Productivity of lift-nets boat that landed the fish at NFP Kwandang still low and based on the criteria of income, R / C, PP, and NPV, fishing effort using the boat lift-net is feasible or still profitable.

Based on the results of research on the productivity and feasibility of fishing enterprise, suggested the need for further research on some other fishing enterprise using different fishing method to be developed.

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