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# The contribution of fishing output to household income: Case of Nangarhar province, Afghanistan

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**Abstract**
This study provides more information about fishing and its importance for the local communities in Nangarhar province. The study also boosts information about the subsector of small-scale fisheries around the fish catching area. Fisheries supply food for households and local market. The data is collected from Behsood, Kama and Goshta districts of Nangarhar province where running most fishing activities. The artisanal fisher's data is collected from randomly selected villages located along side of Kabul River, 11 villages were selected and 98 fishers were interviewed. The fish farming data was collected from owners of fish farms. The total list of the fish farms was collected from the Directorate of Nangarhar Agriculture. Afterward, there were randomly selected 38 samples from the list and were interviewed. To find out the contribution of fishing income, the simple regression model was used. Beside of this model, we tried to find out the difference between artisanal and farm earnings. The result shows that fishing income has significantly contributed at total income of this subsector. The farming earning is higher than artisanal earning.

**Keywords:** fishing income, artisanal, farming, Nangarhar province

## Introduction

The importance of aquaculture has been increased since last half century in the world. Since 1995, the production of these animals increases 8.8% per year which could help to secure the food security of the globe (FAO, 2007) [2, 3]. It could rise the fears of fisheries crisis globally (Mc Goodwin, 1990) [8]. Presently, 120 million people directly work on fishery sector, 97% (116 million) live in developing countries, more than 90% (including almost 32 million fishers) work in the subsector of small-scale fishing. 73% of developing country fishers and fish workers live in Asia (World Bank, 2012). Therefore, fishing has an important role on income generation and food security (Kurien, 2005) [7].

In Afghanistan traditionally, people fishing from the rivers, 1000 tons of products producing from rivers. Recently, fish farms sector emerged and had a significant producing result, over 2000 fish farms are active in the country, mostly in Nangarhar, Helmand, Kandahar, Laghman and Balkh provinces (Afghanistan Times, 2019). In 2016, there were more than 150 fish farms established in Behsood, Kama, Dari-i-noor, Khewa and Goshta districts of Nangarhar province (Zarifi, Yousuf, 2017) [18]. More than 50 farms established in 2018. 282 farms were active in Nangarhar province (NAD, 2019). Furthermore, the Ministry of Agriculture Irrigation and Livestock of Afghanistan implements fish farming project in 291 districts in 33 out of 34 provinces. In Nangarhar thousands of rural people have become self-sufficient farmers and business owners in term of artisanal fishing (World Bank, 2018).

Artisanal fishing is a traditional fishing method in Nangarhar since ancient times, the people who lives a long both sides of Kabul River catches fishes for their consumption and for Business as well. Kabul River is crossing Soorkh Rood, Behsood, Kama, Momand Dara and Goshta districts in Nangahar province. There is fish farming subsector also emerging in Nangarhar since last few years.

This study is exploring the contribution of fishing to households and employment. It is a quantitative research; 136 fishing business people are surveyed.

## Statement of the Problem

Fishing provides substantial income, employment, recreation, livelihoods and revenue in a country (Sobo, 2012) [14]. Fisheries also enable employment and employment provides income for fishers (FAO, 2008) [4]. There is 5.8 million people in the world that earn from fishing less than $1 per day (World Bank, 2012). There has been concern that earing from fishing in Nangarhar could be not enough for the daily consumptions of households. Employment is another concern in Afghanistan that finding job is a tough issue. If there is some shortage regarding income generation, to safe jobs, to provide capital for investment in the fishing subsector. After all, the policy makers will have an appropriate concept for the future policy designing.

## Purpose of the Study

This study provides more information about fishing and its importance for the local communities in Nangarhar province. The study also boosts information about the subsector of small-scale fisheries around the fish catching area. Fisheries supply food for households and local market. The people who are living in the artisanal fishing areas are poor people, they

have less land for agriculture, doing farming, Some of them supply vegetables to the local markets. The crops which yields from the area are vegetables, fruits, corn, wheat, sugarcane, rice. The study helps the local community to propose strategies to increase fishing activities in the area to increase food security and income within households.

136 households were interviewed for this study, 98 families from artisanal and 38 families of fish farmers were interviewed. A well-structured questionnaire was designed for this research. To compare and gain valuable results, the survey was conducted on two subsectors artisanal fishers and farming fishers. It gave us more information about the artisanal fishing subsector, employment, income contribution and the same results was obtained from the farming fisheries. The aim of this study is to propose the results of this study to the policymakers for better strategies.

## Literature Review

According to Panayotou (1982) fishery is defined as a term of "people involved, species or type of fish, area of water or seabed, method of fishing, class of boats, purpose of the activities or a combination of the foregoing features" (Mpemba, 2016) [9]. Since the ancient times, fish and fishing has been having a major role in food security, provider of employment and economic benefits for households (Bene, Macfadyen and Allison 2007) [2]. The importance of fisheries for households in term of food security, employment, income generation, for both fisheries and associated activities like fish processing, agreements, licenses fees and other is significant (FAO, 2008) [4]. Artisanal fishers are most important suppliers for local, small markets, they use traditional fishing technics; particularly, they are involved small-scale fishing in developing countries for income generation and food security (Schorr, 2005) [12]. Artisanal fishing cost could be lower than commercial fishers because of running costs for boats, equipment, fuel consumption, and shorter trips to the nearest fishing area (Jaquet and Pauly, 2008) [6]. More than 50% fishing in developing countries is producing by small-scale fishers, 90 to 95% of small-scale fishing production consuming in the local area. 5.8 million Fishers in the world earn less than $1 per day (World Bank, 2012).

In addition, World Food Summit in 1996 defines food security as "a condition when all people, at all time, have physical and economic access to sufficient, safe and nutritious food to meet their dietary need and food preferences for an active and healthy life". Fish is a rich source of protein where other sources of animal protein are scarce or expensive. According to FAO (2006) computation, 19% of protein intake provided from fish in developing countries (Bene, Macfadyen and Allison, 2007) [2]. The results of some countries indicate that fisheries and fishing have significant results due to employment, income and food security. A study from Kitui Central Sub-County of Kenya shows that there is strong correlation between fish farming and household income, 38.9% households income earned from fishing, 63% of harvested fish of households sold in the market and 37% of them are used for household's consumption (Nzevu, Amwata and Mutua, 2018) [11]. A conducted study in drought risk regions of Zimbabwe expresses that small-scale fishing farms were well embraced by local communities as it led to improvements employment regenerations, household income and food security (shava and Gundidzirai, 2017) [13]. Artisanal fishers, contribute significantly toward livelihoods and food security among communities in Chanyanya fishing camp in Zambia. Artisanal fishing provided income, employment and food security for local and national communities. 94% of them gain their livelihood from fishing. The money earned from fishing is used for building houses, fishing equipment, health care, paying fees for their children's school and others (Sonjiwe, Musuka and Haambiya, 2015) [15].

Another research conducted for West and Center African nations, the results revealed that fishery sector implement an important role to contribute in economic growth, employment, income, export and tax revenues. In addition, in most cases, the current and potential role of small-scale fisheries for food security and poverty reduction are very weak, which push back the food security and poverty reduction policies (Horemans and Kebe, 2006) [5].

## Research Questions

This study examines how fishing production contributes to the income of fishery families. The yield income from fishing is sufficient for family expenses. And it will compare the artisanal and farms activities regarding employment and income contribution.

For this purpose, the following questions arises:

- Does fishing provide a major income contribution for sampled households?
- How much differs the artisanal and farm fishing regarding income inequality per capita?

## Theory, Methods, and Procedures

The data is collected from Behsood, Kama and Goshta districts where running most fishing activities.

The artisanal fisher's data is collected from randomly selected villages located along side of Kabul River, 11 villages were selected and 98 fishers were interviewed. The fish farming data was collected from owners of fish farms. The total list of the fish farms was collected from the Directorate of Nangarhar Agriculture. Afterward, there were randomly selected 38 samples from the list and were interviewed.

As each household has various income sources, to express the importance of each income source the simple regression will find out the contribution of each income source on total annual income as bellow:

$$Yi^{tot} = \beta_0 + \beta_1 FishingInc + \beta_2 AgriInc + \beta_3 NonAgriInc + \varepsilon$$

Where $Yi^{tot}$ denote total annual income; i, shows each sampled household; *FishingInc*, express income from fishing; *AgriInc*, income from agriculture; *NonAgriInc*, income from non-agricultural activities and $\varepsilon$ is the error term of the regression.

In the second step to find out the per capita income of each subsector, the annual per capita will indicate as follow:

$$Yi^{A}pc = Yar^{A}pc + Yf^{A}pc$$

A, indicate average income; where, *pc* is per capita income; *ar*

artisanal fishing families and; *f* means fish farms owners families. It will find out of each artisanal and fish farm household per capita to analyze The Differs of inequality of income between two subsectors.

## Results

The socio-economic results of the interviewed households show that an average 9.3 persons live in a household which states above the national average level. There are 5.2 school age children, 4.4 of them are currently enrolled at schools. Stated electricity is available for 1.3 persons and 3.4 person reached to public clinics around 4kms.

To quantify the results of this study, the OLS model was estimated the findings. In general, three different types of income were assumed as variables, fishing income, agriculture income and nonagricultural income. These were stated in the econometric model as bellow:

- FishingInc = Fishing Income
- AgriInc = Agriculture Income
- NonAgriInc = Nonagricultural Income
- ε = term of errors

**Table 1:** Total Annual Income Model

| Variables | Model: Total Annual Income | | |
|---|---|---|---|
| | Coef | Std.Err | Sig |
| FishingInc | 0.4180 | 0.6546 | 0.0015 |
| AgriInc | 0.3261 | 0.3462 | 0.0021 |
| NonAgriInc | 0.1289 | 0.6524 | 0.0551 |
| .Con | 2.0874 | 0.9921 | 0.0002 |
| Observation | 136 | | |
| R-Squared | 0.5101 | | |

Source (Researcher, 2020).

The whole model is significant and fit is relatively very good (almost 51.1% of household incomes are explained by the independent variables). The relationship between fishing income and total annual income is significant with 0.01 level. Fishery contribute more than 41% of total income of interviewed households which shows significant contribution. The rest two variables agricultural incomes and nonagricultural incomes are also significant with 0.01 and 0.05 levels relatively.

Furthermore, the study shows a big difference among artisanal fishers' and farmer fishers' income.

**Table 2:** Income contrast between artisanal and farm household

| Income | $/Artisanal household | $/Farm household |
|---|---|---|
| Fishing Average per household/annum | 644.955 | 5300.7 |
| Per capita | 0.19/day | 1.56/day |
| Average income of other sources/annum | 706.5 | 1520.4 |
| Total income per household/ annum | 1351.455 | 6821.1 |
| Total income per capita | 0.398/day | 2/day |

Source: (Researcher, 2020)

The artisanal per capita is about 19 cents per day, the income comes from artisanal fishery is very low, with this amount they live under poverty line. Besides of fishing income these families have other sources of income, such as agricultural and nonagricultural incomes, sum of these all incomes are about 40 cents per person per day, it means with all these income sources, these families still live with heavy poverty. From other side, the farming income is higher than artisanal income, per capita income is about $1.5 per day, with this amount these families live with poverty. But these households have other income sources, the sum of all sources are $2 per person per day. It means the living condition of farm fishers better than artisanal fishers.

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