# Utilization Water Reservoir of Ex Sand Mining for Cultivation of Fish Stock by Karamba System

**By :**

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## Abstract

A study on utilization water reservoir of sand mining for cultivation of fish stock of blue dyes fish, freshwater catfish and patin fish by karamba system at urban village of Ladang Bambu, sub district of Tuntungan, Medan City was conducted during October-November 2008. The experiment begin by the building float karamba and stock down of blue dyes fish (*Oreochromis niloticus*), freshwater catfish(*Clarias gariepinus*) and patin fish (*Pangasius hipothalmus*) in the average weight is 2,23 g per fish and observation during 1 (one) month. The results of experiments indicated that the karamba with the size 3 x 3 metere and the depth of net 2 m needs the cost Rp.1.890.000,- (one million and eight hundred and ninety thousand rupiah). The karamba can acoomodate 1000 fish stocks. The stock and cultivation cost during 30 days is Rp. 200 per fish in average. The selling prize of fish stock after 30 days (in the averages weight is 10,4 g/fish) is 500 rupiah. So, the averages peofit 100 rupiah/fishl or 100.000 rupiah/ karamba.

*Key Words: water reservoir of ex sand mining, cultivation of fish stock, and karamba system.*

## Introduction

Excavation of sand in the zone buffer of Belawan River (on of river cross the area of Medan City and as one of water source of PDAM Tirtanadi Medan in the lower stream) always found specially in the middle part up to the upper of the river. The excavation encouraged by the soil morphology that made of river sedimentation material and sedimentation of the mount exploitiion (it is estimated as sedimentation from the eruption of Toba Mount in the last thousand). The soil morphologi consist of the soil profile with the ordo Inceptisol dominant in 50-75 cm in thr upper part (that suitable for the bury soil), and the sand layer that suitable for the construction material

on the depth of 1-2 meter and in the lower part up to the depth of 5,5-6,0 meter as stones and mixing of sand and gravel.

The excavation of soil, sand and stones cause small lakes or water reservoir waduk in the area of 0.5 – 1.0 hectare per mining location (there are not less than 20 mining location) in the depth of 5-6 meter and the depth of water is 4 - 5 meter. The small pond or water reservoir used by the local people for natural fishing pond. For the potency of the inundated area ex sand mining that maybe developed for fish stock commercially, the writer tae efforts to make the area for the cultivation of the fis stock by karamba system.

## Material and Methods

The experiment location at Urban Village of Ladang Bambu, sub district of Tuntungan, Medan City in the elevation of 120 m on above sea level. The experiment was begin by the construction of karamba on July 2008 and cultivation of the fish stock and observation during October-November 2008. The material for karamba are nylon, net, bamboo, drum and plastic rope. The fish stock are the blue dyes fish (*Oreochromis niloticus***)**, freshwater catfish (*Clarias gariepinus*) and patin fish (*Pangasius hipothalmus*) in the average weight is 2,23 g per fish for 1000 fishes per karamba. The observation was conducted during 1 (one) month up the fish has the weight 10 g per fish average. The observation also conducted on production cost and profit from the cultivation of the fish stock by karamba system in water reservoir ex sand mining.

## Result and Discussion

### A. Karamba Construction Cost

The karamba in size 3 x 3 meter and the depth of net 2 meter (Figure 1), need the cost for Rp. 1.890.000,- (one million eight hundred and ninety thousand rupiah) per karamba. The cost is used for purchasing of material and construction cost as shown in Table 1.

Gambar 1. The water reservoir of ex sand mining area in Urban village of Ladang Bambu, sub district of Tuntungan, Medan City as a location of experiment of cultivation of fish stock by karamba system

Table 1. *The construction cost (capital) of one unit of karamba in water reservoir of ex sand mining at urban village Ladang Bambu, sub distict of Tuntungan, Medan City* (2008).

| No. | Material | Unit Prize (Rp.) | Total (Rp.) |
|---|---|---|---|
| 1. | Nilon net 32 $m^2$ | 31.250,- | 1.000.000,- |
| 2. | Drum 4 units | 80.000,- | 320.000,- |
| 3. | Bamboo 4 pieces | 5.000,- | 20.000,- |
| 4. | Rope, wire, etc. | - | 50.000,- |
| 5. | Labor cost | - | 500.000,- |
| Total (One million eight hundreds and ninety thousand rupiahs) | | | 1.890.000,- |

## B. Weight of Fish

Observation on fish stock was conductedon the weight of fish after 30 days. The result of observation is shown in Table 2.

Tabel 2. The average weight of fish stock per fish after be cultivated in the karamba in water reservoir of ex sand mining at urban village of Ladang Bambu, sub district of Tuntungan, Medan City during 30 days (10 October-19 November 2008).

| Description | Blue dyes fish | Big freshwater catfish | Patin fish | Rata-rata |
|---|---|---|---|---|
| Initial weight (g)<br>Weight after 30 days (g) | 2,5<br>10,3 | 2,0<br>10,7 | 2,2<br>10,2 | 2,23<br>10,4 |
| Incresing of weight (g) | 7,8 | 8,7 | 8,0 | 8,17 |
| Persentage (%) of increasing weight | 312 | 435 | 364 | 370 |

Table 2 indicated that the rapid increasing of weight of fish stock is big freshwater catfish up to 435% of the initial weight after cultivated in 30 days in and then patin fish (364%) and latest one is blue dyes fish (312%). This caused by the freshwater catfish has a higher tolerance to thewater condition. As we know that in water reservoir of ex sand mining the water visually is turbid and the water not flow.

## C. Business Analysis

The net profit of business of cultivation of fish stock in karamba system at ex sand mining at urban village of Ladang Bambu Village, sub district of Tuntungan, Medan City is Rp. 100,- (one hundred rupiah) per fish and will cultivated during 30 days. With the capacity of karamba is 1000 fish stock, the net profit of each karamba is Rp. 100.000,- (one hunred thousand rupiah) per karamba per month.

The business analysis of the cultivation of fish stock in karamba in water reservoir of ex sand mining at urban village of Ladang Bambu, sub district of Tuntungan, Medan City is shown in Table 3.

Table 3. Analysis of fishery in keramba at waduk used C dig at Ladang Bambu Village, Tuntungan District Medan City North Sumatera during 30 days (10 October-19 November 2008) in one unit of keramba.

| Description | Capital (Rp) | Selling (Rp) | Profit (Rp) |
|---|---|---|---|
| 1. Purchasing of Fishstock 1000 fishes/keramba @Rp. 200/fish | 200.000,- | - | |
| 2. Purchasing of feedstock Rp. 5.000/ karamba/day during 30 days | 150.000,- | - | |
| 3. Cultivation cost Rp. 50.000,-/keramba | 50.000,- | - | |
| Total costl (A) | 400.000,- | | |
| 4. Selling of fish stock after 30 days @Rp.500/fish (B) | - | 500.000,- | |
| 5. The difference of selling less capital (B-A) | - | - | 100.000,- |

Based on Table 3, it is indicated that the profit of the cultivation of fish stock business in the water reservoir of ex sand mining at urban village of Ladang Bambu, sub district of Tuntungan, Medan City is Rp.100.000 (one hundred rupiah) per karamba. It means that of t nine (9) units of karamba in this experiment, the profit is Rp. 900.000,- (nine hundred rupiah) per month. This prospective business is developed and until now there are 112 units of karamba in the studied location that get the profit about Rp.11.200.000,- (eleven millions two hundred thousand rupiah) per month.

The construction cost of karamba is Rp. 1.890.000/keramba (Table 1) will refund in 1.6 - 2.0 years if productivity can maintained to Rp.100.000 per keramba per month.

## Conclusion

1. Utilization of water reservoir of em sand mining at urban village of Ladang Bambu Villge, sub district of Tuntungan, Medan City for the fish stock cultivation, specially the freshwater catfish, patin and blue dyes fishes are more prospective indicated by the increasing of weight of fish more than 300 % during 30 days.
2. The growth of freshwater catfish and patin fish is suitable to the condition of the water reservoir of ex sand mining with turbidity eater and did not flow rather than the blue dyes fish.
3. The profit of the fish stock cultivation business in the water reservoir of ex sand mining at urban village of Ladang Bambu, sub district of Tuntungan, Medan City during pemeliharaan 30 days is Rp.100.000,- (one hundred rupiah) per keramba.
4. The construction cost of karamba can be refuned from the profit during 1.6 – 2.0 years.

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