Construction of fishing gears used as capturing shellfish in Bagan Deli marine coastal area, North Sumatera, Indonesia

T H Iqbal1,2*, Rauzatullah1, E Miswar1, D Rianjuanda1
1Department of Aquaculture, Faculty of Marine and Fisheries, Universitas Syiah Kuala, Indonesia
2Marine and Fisheries Research Center, Universitas Syiah Kuala, Indonesia

*Email: tee.hariss@unsyiah.ac.id

Abstract. Bivalves and gastropods nowadays became mainly catches shellfish by coastal community due to their commercial values to the market. Considering the constructions of fishing gears may get a unique behavior of fisherman for gaining more shellfish. However, this research concern about the constructions of fishing gears used and shellfish catches by local fisherman in Bagan Deli marine coastal area. The sampling was took place and date at Medan Belawan's District in North Sumatera, Indonesia during January 2019. In-situ observation was used to identify the type of fishing gears, its constructions and shellfish catches by local fisherman and describing systematically into data tabulation. Some results showed that mostly local fisherman used cage grabber, net claw and local fishing gear instrument namely uncang. Another interesting result is that the different material of its constructions of fishing gears affected to a difference of shellfish catches. These facts concluded that local fisherman had specific skill and deep knowledge to perform its fishing gears as traditional methods of capturing shellfish.

1. Introduction
Bagan Deli is one of Medan Belawan's District in North Sumatera, Indonesia that geographically located in a marine coastal area, there is a huge number of fishermen living there are shell collectors. For a long time ago, conventional and traditional fishing gears were considered as a tool for capturing shellfish in Bagan Deli.

Bagan Deli coastal area is known as the important habitat for shellfish such as blood cockle clam and (Anadara granosa) and pen shell (Atrina pectinata). However, there is no scientific report about the information on fishing gear and its constructions that are used by a local fisherman.

Bivalves and gastropods such as clams and oysters are became mainly catches by coastal community due to their commercial values to the market [1]. Somehow, kind of fishing gears that being used by fisherman may cause damage to the environments in case of endangering construction of fishing gears [2]. On the other hand, to conserve remain stable of the coastal ecosystem, type of fishing gears must be modified properly [3].

Since, the purpose of this study is to examine the fishing gear and its constructions and also to figure out the shellfish catches.

2. Materials and Methods
2.1. Site and time
The sampling period of this study was on January 2019 January in Bagan Deli marine coastal area, North Sumatera, Indonesia (Figure 1).
2.2. Data collection

The in-situ observation method was used to identify the type of fishing gears, its constructions and shellfish catch. Moreover, a direct questionnaire is giving to local fishermen also used to clarify the completeness of observed study.

2.3. Data analysis

A general descriptive analysis was used to determine systematically the phenomenon and facts on the field by describing into data tabulation.

3. Results and Discussions

Total two conventional and one traditional fishing gears were used by local fishermen for shellfish catching, they were *cakar besi* (cage grabber), *cakar jaring* (net claw) and *uncang* (handpicking) (Figure 2, Figure 3 and Figure 4), respectively.

| Table 1. Contructions of fishing gears found Bagan Deli marine coastal area, North Sumatera, Indonesia |
|---|---|---|
| No | Constructions | Fishing gear type |
| | | *Cakar besi* (cage grabber) | *cakar jaring* (net claw) | *uncang* (handpicking) |
| 1 | Width open mouth | 120 cm | 80 cm | 50 cm |
| 2 | Height open mouth | 28 cm | 20 cm | - |
| 3 | Back net height | 85 cm | 250 s/d 200 cm | 40 cm |
| 4 | Back width | 87 cm | - | - |
| 5 | Height back net | 28 cm | - | - |
| 6 | Material made of | Iron, wood and raft | Iron metal, net, raft and wood | Styrofoam, net and raft |

Basically, the conventional fishing gear of Cage grabber and Net claw has quite similar constructions. Nevertheless, compared to the cage grabber, net claw has no rear width and rear height in consequence of its shape the edge of the tail part is cone shrinks. The other differences are based on the material used, where those three fishing gear types have different material made of (Table 1).
The result shows that mostly the types of catch found are antique ark clam (*Anadara antiquate*), blood cockle clam (*Anadara granosa*), pen shell (*Atrina pectinata*) and salome shells (*Paphia undulate*) and (Figure 4, 5, 6 and 7, respectively). Those kinds of shellfish were caught by different fishing gears type. *A. antiquate* and *A. granosa*, and *A. pectinata* were caught by cage grabber altogether with handpicking gears, while *P. undulate* was caught by net.

In this research also discovered that different places may get different catching of shellfish, by using cage grabber and net claw, shellfish were found at coordinate of N: 03°43'41.2", E:098°50'25.8", where started fishing base was in N: 03°46'20.5", E: 098°42'11.6". Subsequently, handpicking gear was used in shallow water near coastal with depth range from 50 cm -100 cm with fishing ground coordinate was in N: 03°49'07.0", E: 098°42'09.7", where fishing base starting point was in N: 03°46'19.18", E: 098°42'08.9".

All of those shellfish were caught in nearby or vicinity of Bagan Deli marine coastal area, as their native habitat was in shallow water [4, 3, 1] and need specific skills and knowledge to perform its fishing gears as traditional methods of capturing shellfish [5, 1, 2].
4. Conclusion

Cakar besi (cage grabber), cakar jaring (net claw) and uncang (handpicking) are mostly fishing gears that used by local fisherman in Bagan Deli, Medan Belawan. The construction consisting of iron, wood and raft for cakar besi (cage grabber), iron metal, net, raft and wood for cakar jaring (net claw) and styrofoam, net and raft for uncang (handpicking). Moreover, antique ark clam (Anadara antiquate), blood cockle clam (Anadara granosa), pen shell (Atrina pectinata) and salome shells (Paphia undulate) became dominant shellfish that being catched by those three kind of fishing gears.

References

[1] Lagade V M and Muley D V 2018 Indian Journal of Geo Marine Science 47 (8) 1672-1678
[2] Balasubramanian S and Varshini A 2019 Indian Science Congress Association 5 (2) 297-301
[3] Suuronen P and Valdemarsen J W 2001 Reykjavik Conference on Responsible Fisheries in the Marine Ecosystem 1-20 pp
[4] Adamidou A 2007 State of Hellanic Fisheries 6 23-43
[5] Bhakta D, Manna R K, Meetei W A, Solanki J K and Sah R K 2016 International Journal of Fisheries and Aquatic Studies 4 (4) 142-145