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# CATCH COMPOSITION OF LIFT NET BOATS BASED ON COORDINATE POINTS IN BARRU REGENCY

Komposisi Hasil Tangkapan Bagan Perahu Berdasarkan Titik Koordinat di Kabupaten Barru

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## ABSTRACT

Barru Regency has significant potential in capture fisheries, particularly through the use of lift net boats. This study aimed to identify the species composition and catch volume of lift net boats based on coordinate points at three different locations: Tanete Rilau, Sumpang Binangae, and Takkalasi waters. The research was conducted from July to September 2024 using field surveys and interviews with fishermen and fish collectors. Data were analyzed descriptively and quantitatively using ANOVA. The results showed that the dominant species caught were anchovy (*Stolephorus* sp.) with a total of 6,342 kg, scad (*Decapterus* sp.) with 2,236 kg, and Hairtail (*Trichiurus* sp.) with 315 kg. The highest catch was recorded in Takkalasi (4,095 kg), followed by Tanete Rilau (3,161 kg), and the lowest in Sumpang Binangae (1,637 kg). Although catch quantities varied among locations, statistical analysis indicated no significant differences ($p > 0.05$). These findings suggest that catch composition is more influenced by seasonal factors, fish phototactic behavior, and habitat suitability rather than geographic coordinates alone. This study provides valuable insights for optimizing fishing gear operations and supporting sustainable fisheries management in the coastal areas of Barru Regency.

**Keywords**: Catch Composition, Lift Net Boats, Coordinate Point, Barru Regency

## ABSTRAK

Kabupaten Barru memiliki potensi perikanan tangkap yang besar, salah satunya dengan penggunaan alat tangkap bagan perahu. Penelitian ini bertujuan untuk mengidentifikasi jenis dan jumlah komposisi hasil tangkapan bagan perahu berdasarkan titik koordinat di tiga lokasi berbeda: Perairan Tanete Rilau, Sumpang Binangae, dan Takkalasi. Penelitian dilaksanakan pada Juli–September 2024, menggunakan metode survei lapangan dan wawancara dengan nelayan serta pengepul. Data dianalisis secara deskriptif dan kuantitatif menggunakan uji ANOVA. Hasil menunjukkan bahwa jenis ikan yang dominan tertangkap adalah ikan teri (*Stolephorus* sp.) sebanyak 6.342 kg, ikan layang (*Decapterus* sp.) sebanyak 2.236 kg, dan ikan layur (*Trichiurus* sp.) sebanyak 315 kg. Lokasi dengan hasil tangkapan tertinggi adalah Takkalasi (4.095 kg), disusul Tanete Rilau (3.161 kg), dan terendah di Sumpang Binangae

(1.637 kg). Meskipun terdapat variasi jumlah hasil tangkapan antar lokasi, hasil uji statistik menunjukkan perbedaan tidak signifikan ($p > 0,05$). Temuan ini menunjukkan bahwa komposisi hasil tangkapan dipengaruhi oleh faktor musim, perilaku ikan terhadap cahaya, dan kesesuaian habitat, bukan semata-mata letak koordinat geografis. Penelitian ini memberikan informasi penting bagi upaya optimalisasi alat tangkap dan pengelolaan perikanan yang berkelanjutan di wilayah pesisir Kabupaten Barru.

**Kata kunci**: Hasil Tangkapan; Bagan Perahu; Titik Koordinat; Kabupaten Barru

## INTRODUCTION

Capture fisheries is a crucial sector that plays a vital role in supporting the economy of coastal communities in Indonesia, including in Barru Regency, South Sulawesi. Barru Regency is located on the west coast of South Sulawesi Province and has a coastline stretching 78 km. Therefore, the majority of its population relies on fishing. Fishing is a vital part of utilizing fishery resources, but excessive fishing can lead to imbalances in the aquatic ecosystem. Therefore, careful consideration is needed in fishing activities, both regarding the type of fishing gear used and the resulting catch, to ensure optimal and sustainable operations.

One of the traditional fishing gears widely used by fishermen in Barru Regency is the bagan perahu (boat net). This fishing gear plays a crucial role in capture fisheries because it is specifically designed to catch small, pelagic fish of high economic value, such as anchovies and scad. Its use has been passed down through generations among local fishermen and remains a primary means of supporting the livelihoods of coastal communities in the region.

Bagan perahu (boat lift net) is a type of fishing gear belonging to the lift net group and is commonly used by fishermen to catch small pelagic fish. The main components of a bagan perahu include a net, a bamboo frame, iron pipes, rigging, lights, and a motorized boat. The net used is made of specially designed netting material to form a pouch. This pouch is made from several sheets of netting sewn and assembled to form a rectangular fish-catching container, with a supporting frame made of bamboo and iron pipes (Mallawa, 2012). Over time, this type of fishing gear has continued to develop and refine (Sulaiman, 2015).

This tool is operated by a boat and is useful for moving from one location to another. The net is lowered into the water and then pulled vertically back to the surface once the fish are on the net. Most operations are conducted at night or early morning (Surbakti & Sir, 2021), using artificial lighting to attract positively phototactic pelagic fish (Rohmana *et al.,,* 2021). The use of lights as the main attractant in boat lift net operations has been shown to increase the effectiveness of small pelagic fish capture, especially in relatively calm waters (Kamal *et al.,,* 2020). In the coastal waters of Barru Regency, the types of fish most commonly caught by fishermen are small pelagic fish such as anchovies, tembang, peperek, and squid (Nurhalizah, 2022). This small pelagic fishing is usually only carried out by traditional fishermen domiciled in coastal areas and only to meet the needs of local and inter-island markets. The effectiveness of boat lift nets is greatly influenced by environmental factors, fishing time and season, and the location or coordinates of the fishing point (Rahman *et al.,,* 2021). In practice, the composition or proportion of fish species obtained from boat lift net fishing activities varies depending on the geographic location and oceanographic conditions of the local waters. Determining a strategic location or coordinate point is very important for obtaining optimal catches (Syahrul, 2023). Furthermore, different regions provide more detailed information on the distribution and dominant fish species caught at specific locations, thus supporting sustainable fisheries management.

In practice, this fishing gear is still less selective, sometimes catching unsuitable fish (Mahendra *et al.,,* 2015). Furthermore, many studies have not considered the spatial effects of geographic coordinates on catch composition. Meanwhile, other studies have shown

differences in catch composition based on operating time and season (Hasmawati *et al.,,* 2022). Therefore, this study aims to identify the types and composition or proportion of fish species obtained from lift net fishing activities at different coordinate points in Barru Regency, potentially providing a deeper understanding of the potential of small pelagic fish resources and their variations across fishing locations.

## RESEARCH METHODS

### Place and Time

This research was conducted over a three-month period, from July to September 2024. The research locations were selected purposively, considering the coordinates of fishing areas predominantly used by bagan boats in the coastal areas of Barru Regency. Three main locations served as research points: Tanete Rilau Waters at 4°29'46.8" South Latitude and 119°25'35.4" East Longitude, Sumpang Binangae Waters at 4°30'02.4" South Latitude and 119°26'08.4" East Longitude, and Takkalasi Waters at 4°32'06.6" South Latitude and 119°25'26.4" East Longitude.

These three locations were selected because they have a relatively high intensity of bagan boat use and represent the characteristics of the coastal waters of Barru Regency, which are centers of small pelagic fish fishing activity. Furthermore, the research locations were chosen based on ease of access for researchers conducting observations, interviews, and collecting data directly in the field. The spatial data, in the form of coordinate points, was then mapped to show the relative positions between research locations, as presented visually in Figure 1.

Figure 1. Research Location Map

### Tools and Materials

Field data collection was conducted using various tools and supporting materials. The equipment utilized included boat charts, the primary fishing gear, fishing equipment and fishing aids, digital scales for weighing the catch, and stationery and documentation tools for recording and visual data collection. The materials used included fish samples from the catch for analysis and questionnaires used as interview instruments with fishermen.

### Method of collecting data

Field data collection was conducted through direct observation, data collection, and interviews with bagan perahu fishermen over a three-month period, from July to September. Three fishermen participated, each representing one research location. Catch data was recorded on each fishing trip by counting the type and number of fish caught, then weighing them using a digital scale to obtain accurate data.

**Data Analysis**

The tabulated results of the research data were analyzed quantitatively using the ANOVA (Analysis of Variance) test using the SPSS 25 application. This analysis was chosen because it is able to test whether there are significant differences in catch results at the three research locations. Before conducting the ANOVA test, the data were first analyzed to ensure normality and homogeneity of variance to ensure that the basic assumptions of the parametric test were met. In addition, a qualitative analysis was also conducted to provide a more in-depth description of the characteristics of the fishing locations and the variations in fish species caught. By combining these two analyses, the research results not only show quantitative differences between locations but also provide a contextual understanding of water conditions and dominant fish species.

## RESULT

The results of the boat chart catch based on the coordinate points of three different locations are presented in Figure 2.

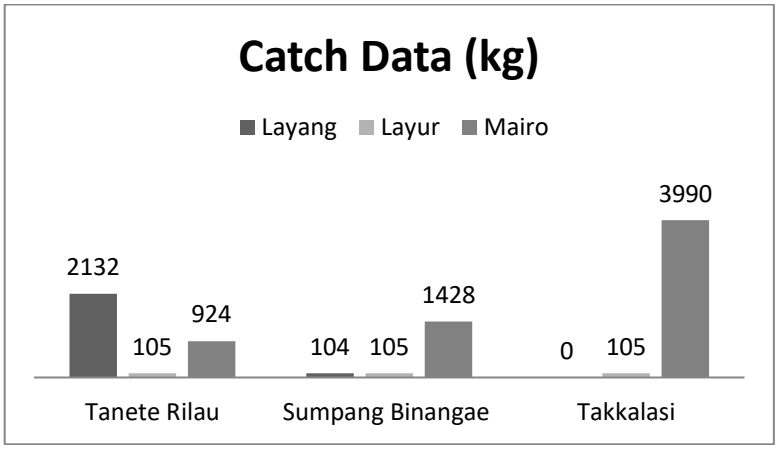


Figure 2. Number of catches from boat lift nets

Figure 2 shows a comparison of total fish catches from three locations: Tanete Rilau, Sumpang Binangae, and Takkalasi. Fish caught on the boat-based bagan included scad, laur, and mairo. Each location exhibited significant variations in both species and total numbers.

At Tanete Rilau, the catch was dominated by scad, with a total of 2,132 kg, followed by mairo at 924 kg, while hairtail was recorded at the lowest, at 105 kg. At Sumpang Binangae, the most common fish caught was mairo, with a total of 1,428 kg, while hairtail and scad showed relatively small and almost equal catches, at 104 kg and 105 kg, respectively. Unlike the two previous locations, at Takkalasi, the catch consisted of only two fish species: mairo (3,990 kg) and hairtail (105 kg), while no hairtail was found at this point.

## DISCUSSION

The coastal area of Barru Regency is divided into seven sub-districts, five of which have coastal status: Tanete Rilau, Barru, Balusu, Soppeng Riaja, and Mallusetasi. Of these five sub-districts, only three sub-districts have fishermen using bagan boats as fishing gear: Tanete Village in Tanete Rilau District, Sumpang Binangae Village in Barru District, and Takkalasi Village in Balusu District. This fishing gear is used to catch small pelagic fish, such as anchovies and scads. Bagan boats are generally operated at night with the aid of lights to attract fish to the net area. In Barru Regency, bagan boat construction is still made from wood, equipped with main components such as nets, net frames, rigging, and supporting equipment such as lights, rollers, scoops, and storage boxes. In general, the structure of a bagan boat

consists of a bagan pole, the main bagan building, the mast, and supporting steel ropes. The lift net operation process involves several stages, including preparation, setting up, lowering the net, monitoring fish in the waters, lifting the net, collecting the catch, and finally sorting the fish by type and size.

The results obtained from the lift net catch data indicate that the highest catch was in Takkalasi waters, with 4,095 kg. The lowest catch was in Tanete Rilau waters, with 3,161 kg. The catch in Barru waters, based on different coordinates, showed no significant differences in catch composition across the three fishing locations ($p > 0.05$). This is likely due to the relatively close proximity of the three locations within the same waters. In addition to location, several other variables influence the catch of bagan boats, including the timing of the fishing (bright or dark moon), water depth, distance of the bagan from the shore, gear density in the area, and the duration of gear operation (Ekawaty, 2015; Nurlindah *et al.,,* 2017).

The most commonly caught fish species in Barru Regency waters were anchovies (*Stolephorus* sp.) with a total of 6,342 kg, scads (*Decapterus* sp.) with 2,236 kg, and the least commonly caught was hairtail (*Trichiurus* sp.) with 315 kg. The high catch of anchovies (*Stolephorus* sp.) indicates that this species is highly responsive to light (Rahardjo *et al.,,* 2019; Amrullah *et al.,,* 2022), or exhibits strong positive phototaxis. In this case, the lights used as attractors on boat nets play an important role in attracting anchovies to the net area (Nursam, 2016). Furthermore, anchovies are concentrated above the water surface, unlike other fish that are approximately 20-30 meters below the water surface (Sudirman & Nessa, 2011), thus increasing their chances of being caught. The high catch of anchovies may be due to the peak period or period of fishing activity, which occurs from July to November (Irnawati & Rahmawati, 2021; Tana, 2021). Similar studies also show that anchovies are the most commonly caught fish using boat lift nets (Rahayu, 2022; Syahrul, 2023). The second-highest catch was scad (*Decapterus* sp.), at 2,236 kg. This fish is also known to respond positively to light, although not as strongly as anchovies. A study by Atthallah *et al.,* (2022) demonstrated that lighting duration and light intensity can influence the number of scads caught. The small number of scads caught may be due to their habitat preference, which prefers waters with muddy substrates at the bottom and is less responsive to surface light. Meanwhile, at the research site, the substrate was predominantly sandy and rocky (Sudirman & Nessa, 2011).

The insignificant difference in catch yields between the three coordinate points ($p > 0.05$) indicates that spatial factors, such as differences in geographic coordinates, have a smaller influence than temporal factors (fishing season) and fish behavior in response to light (Syahdan *et al.,,* 2015). This finding aligns with research by Irnawati & Rahmawati (2021) and Tana *et al.,* (2021), which showed that the peak anchovy season occurs between July and November, the period during which this study was conducted. Other studies also indicate that gear density, operating time (bright and dark moons), and fishing duration also influence catch yields (Ekawaty, 2015; Nurlindah *et al.,* 2017). Therefore, optimal catch yields depend not only on site selection but also on appropriate operating timing and gear management strategies. Overall, the pattern shown in Figure 2 indicates that the species composition and abundance of catches are uneven across locations, making it important to consider the ecological characteristics and lifestyles of each species in local fisheries planning.

The results of this study are expected to serve as a basis for improving the efficiency of capture fisheries, particularly those using boat lift nets, while also encouraging more responsible fishing practices. By utilizing information on catch composition, fishermen can plan more targeted operational strategies, thereby not only boosting productivity but also reducing the potential risk of overexploitation in the coastal areas of Barru Regency.

## CONCLUSION

The research concluded that the species structure of fish caught using lift nets in Barru Regency waters at various coordinate points did not show significant differences (P > 0.05). This indicates that the distribution of small pelagic fish in the region is relatively even, thus the effectiveness of lift nets as a fishing gear can be said to be consistent across fishing locations.

The most common fish species in fishing activities include anchovies, scads, and ribbonheads. Of these three species, anchovies contributed the largest to the total catch, reaching 6,342 kg. The high number of anchovy catches reflects the abundant availability of this fish resource and its role as a primary commodity in small pelagic fisheries in Barru Regency. These results also emphasize the importance of sustainable anchovy management, given its high economic value and dependence on the balance of coastal ecosystems.

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