# KINGDOM OF CAMBODIA
## National  Religion  King

Ministry of Agriculture Forestry and Fisheries
Fisheries Administration

## Cambodia Programme for Sustainable and Inclusive Growth in the Fisheries Sector: Capture Component

## Monthly Statistical Report
## Scientific Catch Assessment of Inland Fisheries in Cambodia September 2023

## By Inland Fisheries Research and Development Institute

# 1.    Introduction

IFReDI, with technical assistance from FAO CAPFISH project under EU budget support, is implementing a scientific catch assessment survey, using a monthly household recall survey for inland fisheries in Cambodia. The aim is to obtain better information on catch and effort by small-scale household fisheries in Cambodia, and to develop a sustainable catch monitoring methodology for implementation by provincial fisheries administrations, supported by IFReDI. The current monthly statistical report provides preliminary analysis based on the available data and focuses on the main indicators that are covered by the catch assessment survey. A more comprehensive analysis will be included in the annual report.

## 2. Methodology of data collection and analysis

A description of the methodology can be found in: Fisheries Administration (FiA). 2021. Manual for Scientific Catch Assessment by Recall survey of Inland Fisheries in Cambodia. Inland Fisheries Research and Development Institute of the Fisheries Administration, Phnom Penh, Cambodia. 47 pages.

The total estimated catch in this report is calculated using the proportion of fishing households found by the random household selection under the Household Selection Interview survey. This is taken to be representative for the proportion of fishing households for each fishing area and this is combined with the total number of rural households by fishing area from the NIS 2019 population census to estimate the total number of fishing households. The Fishing Activity Coefficient is estimated from proportion of households reporting fishing activities in the Household Catch Interview.

Estimates for CPUE, the average (mean) daily household catch and the mean monthly household catch used for extrapolating the total catch, come with a value for the relative standard error ($\varepsilon\%$). This is used to indicate the statistical accuracy of the estimate for the mean catch. If the $\varepsilon\%$ is higher than 30% this indicates a high inaccuracy[1], either due to high variation or low sample size and the value cannot be used to represent the real value of the mean catch and are clearly indicated in the tables included in this report.

In tables with the proportion of reported catch obtained by habitat and fishing gear, the average daily catch by habitat or gear (CPUE) isn't included. The available data displays too much variation for it to be statistically accurate for that level of detail for monthly estimates and cannot be expected representative for the real CPUE at low numbers of observations available. When relevant this will be included in the annual report, if sufficient observations are available for individual gears/habitats that give a high enough statistical accuracy.

# 3.    Statistical tables and results

**Table 1.**    Number of random selected households covered by the survey and proportion of target household by fishing area for September 2023.

| Fishing Area | Villages | Household | | |
|---|---|---|---|---|
| | | Count | Target | Proportion |
| Coastal | 3 | 45 | 45 | 100.0% |

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[1] For national statistical reports the rule of thumb states that if the relative standard error ($\varepsilon\%$) is higher than 30%, the average should not be **reported** and that only estimates with a value of $\varepsilon\%$, below 25% should be considered **statistically valid**. The current report includes all estimated values to indicate that an estimate is available, with the value for $\varepsilon\%$ indicating the statistical accuracy.

| | | | | |
|---|---|---|---|---|
| Floodplain | 17 | 257 | 255 | 100.8% |
| Plateau | 10 | 151 | 150 | 100.7% |
| Tonle Sap | 20 | 300 | 300 | 100.0% |
| Mountainous | 6 | 90 | 90 | 100.0% |
| **Grand Total** | **56** | **843** | **840** | **100.4%** |

**Table 2.** Mean **daily** household catch (CPUE), with number of active fishing households, standard deviation and relative standard error, by fishing area.

| Fishing Area | Active HH | Daily HH catch (Kg) | SD | ε% |
|---|---|---|---|---|
| Coastal | 24 | 2.24 | 1.26 | 11.4% |
| Floodplain | 149 | 3.30 | 3.99 | 9.9% |
| Plateau | 131 | 2.90 | 3.12 | 9.4% |
| Tonle Sap | 215 | 4.95 | 7.30 | 10.0% |
| Mountainous | 58 | 4.38 | 5.67 | 17.0% |
| **Overall** | **577** | **3.89** | **5.50** | **5.9%** |

Mean daily catch calculated based on the reported 5-day catch and fishing days, with SD is Standard Deviation; ε% is relative Standard Error

**Table 3.** Mean **monthly** household catch, with proportion of active fishing households, standard deviation, relative standard error and total estimated catch by fishing area.

| Fishing Area | % Active HH | Monthly HH catch (Kg) | SD | ε% | Total (MT) | Contribution (%) |
|---|---|---|---|---|---|---|
| Coastal | 53% | 28.63 | 4.34 | 18.6% | 944 | 2.1% |
| Floodplain | 58% | 40.16 | 9.31 | 11.4% | 14,333 | 32.4% |
| Plateau | 87% | 47.12 | 10.05 | 11.2% | 3,987 | 9.0% |
| Tonle Sap | 72% | 89.35 | 26.23 | 12.0% | 24,379 | 55.1% |
| Mountainous | 64% | 95.54 | 28.57 | 23.6% | 8,089 | 18.3% |
| Total estimated catch (MT) | | | | | 51,732 | |

SD is Standard Deviation; ε% is relative Standard Error

**Table 4.** Proportion of fishing days on which male and female adults and children are reporting fishing activities.

| Fishing Area | Adult Female | Adult Male | Child Female | Child Male |
|---|---|---|---|---|
| Coastal | 9.6% | 42.3% | 0.0% | 0.0% |
| Floodplain | 9.1% | 87.5% | 0.0% | 3.4% |
| Plateau | 4.6% | 71.1% | 0.0% | 0.6% |
| Tonle Sap | 11.1% | 78.1% | 0.0% | 2.1% |
| Mountainous | 14.5% | 93.3% | 3.0% | 0.0% |
| **Grand Total** | **9.6%** | **79.0%** | **0.3%** | **1.8%** |

The maximum involvement of each gender and age group is 100% for each fishing area, if they are fishing on all reported fishing days, the total for each fishing area can be more than 100%.

**Table 5.** Reported catch (Kg) with proportion caught by main boat type by fishing area.

| Fishing Area | Catch (Kg) | No boat | Motorised | Non-motorised |
|---|---|---|---|---|
| Coastal | 90.9 | 85.6% | 14.4% | 0.0% |
| Floodplain | 724.1 | 48.9% | 37.8% | 13.3% |
| Plateau | 778.0 | 21.1% | 69.2% | 9.7% |
| Tonle Sap | 2,646.0 | 19.9% | 72.2% | 7.8% |
| Mountainous | 734.2 | 58.6% | 40.8% | 0.5% |
| **Grand Total** | **4,973.2** | **31.2%** | **61.1%** | **7.7%** |

Overall proportion based on weighted average catch by main boat type and fishing area, not reported total catch[2]
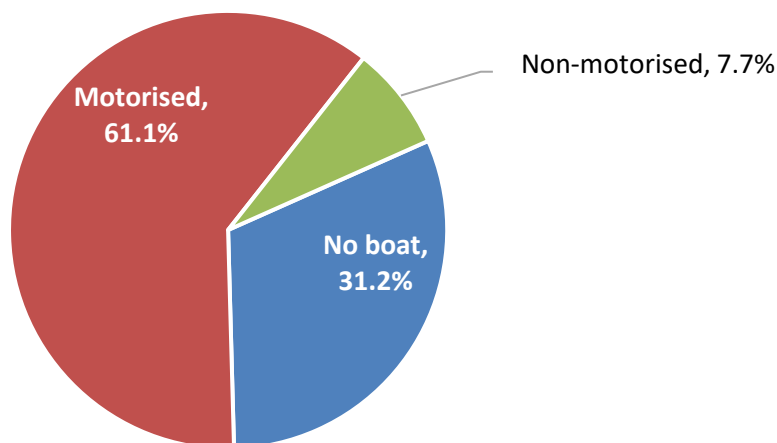


**Figure 1.** Overall contribution of the main boat types to total reported catch.

**Table 6.** Proportion and reported catch by habitat for single habitat catches by fishing area.

| Fishing Habitats | Coastal | Floodplain | Plateau | Tonle Sap | Mountain | Grand Total |
|---|---|---|---|---|---|---|
| Floodplain: flooded forest | 0.0% | 2.1% | 0.2% | 39.1% | 0.4% | 19.99% |
| Floodplain: rice fields (rain) | 35.3% | 12.5% | 6.6% | 19.3% | 28.1% | 17.5% |
| Mekong Mainstream | 0.0% | 4.3% | 69.0% | 0.0% | 0.0% | 13.6% |
| Floodplain: lakes and ponds | 25.3% | 29.0% | 1.5% | 6.6% | 25.2% | 12.0% |
| Tributaries to Tonle Sap | 0.0% | 13.6% | 0.0% | 12.4% | 0.0% | 8.2% |
| Major Tributaries | 0.0% | 1.1% | 7.1% | 0.0% | 42.4% | 7.7% |
| Stream | 6.6% | 2.7% | 0.0% | 9.3% | 3.9% | 5.7% |
| Floodplain: rice fields (flooded) | 0.0% | 13.7% | 0.4% | 5.2% | 0.0% | 4.7% |
| Sub-Stream | 6.0% | 5.2% | 13.9% | 2.1% | 0.0% | 4.5% |
| Irrigation canals | 23.5% | 10.4% | 0.4% | 2.6% | 0.0% | 3.3% |
| Unspecified habitats | 0.0% | 3.9% | 0.0% | 1.6% | 0.0% | 1.4% |
| Reservoir | 0.0% | 1.4% | 0.9% | 1.6% | 0.0% | 1.2% |
| Seasonal swamps | 3.4% | 0.0% | 0.0% | 0.2% | 0.0% | 0.2% |
| **Grand Total (kg)** | **114.5** | **997.3** | **1,028.8** | **3,201.8** | **923.5** | **6,266.0** |

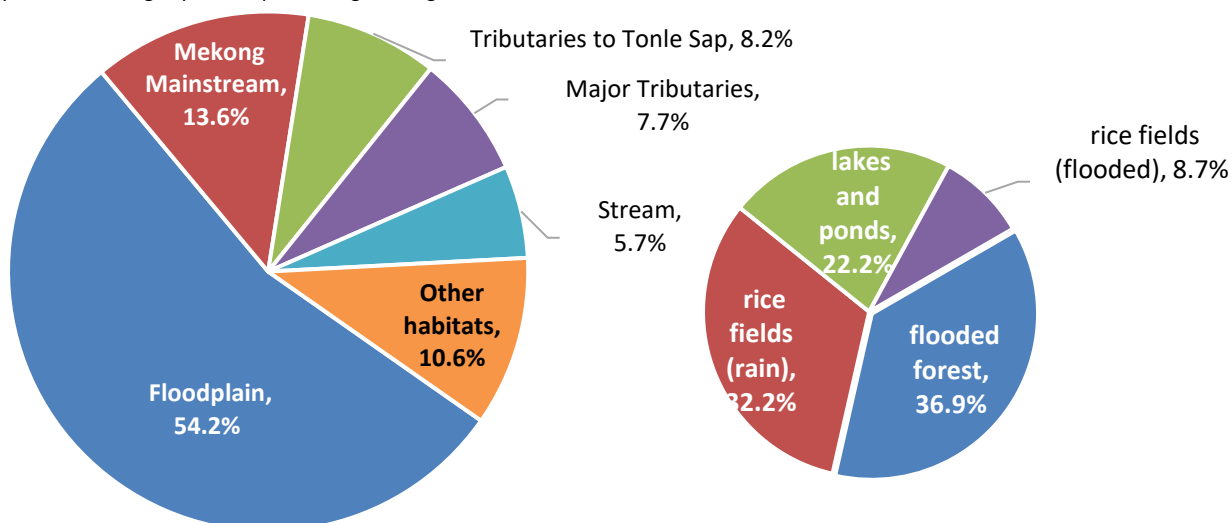Only catch for fishing days that report fishing in a single habitat is included.



**Figure 2.** Overall contribution of the habitats to total reported catch, with proportion of catch for floodplain habitats

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[2] This is the standard way to calculate, but isn't done for habitat and gear catch, as this is complicated by fishing days where the reported catch is from multiple habitats or caught by multiple gears

**Table 7.** Proportion and reported catch by gear for single gear days, by fishing area.

| Fishing gears | Coastal | Floodplain | Plateau | Tonle Sap | Mountain | Grand Total |
|---|---|---|---|---|---|---|
| Stationary gillnet | 3.0% | 46.9% | 72.1% | 43.2% | 3.9% | 43.7% |
| Horizontal cylinder trap | 13.1% | 7.3% | 4.0% | 31.4% | 25.8% | 22.5% |
| Unspecified gears | 0.0% | 3.3% | 8.3% | 7.5% | 55.0% | 11.9% |
| Hand capture | 37.8% | 7.5% | 0.0% | 6.0% | 2.5% | 5.4% |
| Drifting gillnet | 4.6% | 12.4% | 5.7% | 2.3% | 0.0% | 4.2% |
| Cast net | 0.0% | 5.3% | 1.2% | 2.4% | 6.7% | 3.1% |
| Horizontal cylinder trap | 1.3% | 1.1% | 0.0% | 3.1% | 0.5% | 2.0% |
| Pole and line | 9.6% | 1.1% | 4.1% | 0.9% | 4.7% | 2.0% |
| Hook long line | 3.6% | 0.5% | 0.6% | 2.4% | 0.0% | 1.6% |
| Hook and line | 0.0% | 2.5% | 3.9% | 0.6% | 0.4% | 1.4% |
| Spear | 14.8% | 4.8% | 0.0% | 0.0% | 0.0% | 0.9% |
| Bamboo vertical cylinder trap | 0.0% | 6.0% | 0.0% | 0.0% | 0.0% | 0.9% |
| Seine nets | 0.0% | 1.4% | 0.0% | 0.1% | 0.0% | 0.26% |
| Push nets | 10.3% | 0.0% | 0.0% | 0.0% | 0.0% | 0.2% |
| Bow and guns | 1.9% | 0.0% | 0.0% | 0.0% | 0.5% | 0.1% |
| Drop door trap | 0.0% | 0.0% | 0.1% | 0.0% | 0.0% | 0.02% |
| scoop baskets | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.02% |
| **Grand Total (kg)** | **114.5** | **997.3** | **1,028.8** | **3,201.8** | **923.5** | **6,266.0** |

Only catch for fishing days that report fishing with a single gear is included, therefore the total is different from reported catch by habitat.
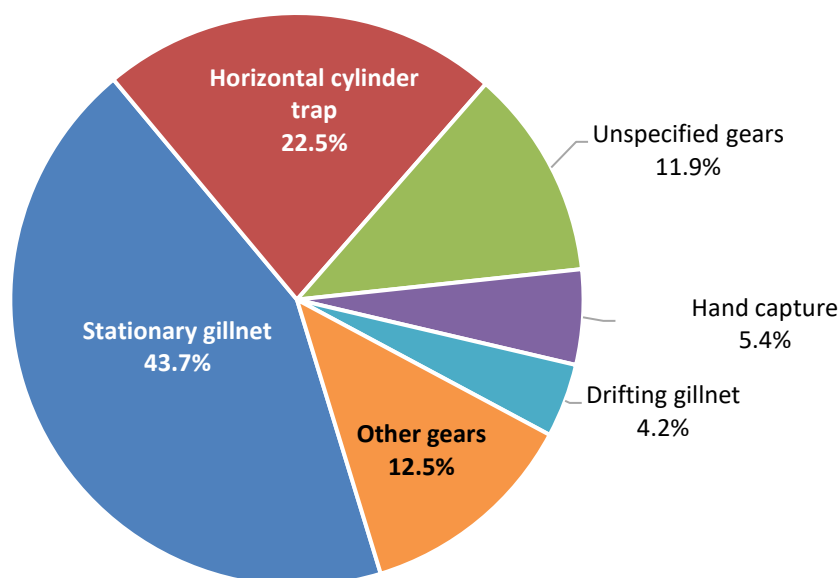


**Figure 3.** Overall contribution of the gears to total reported catch.

**Table 8.** Reported disposal by fishing area in weight and proportion.

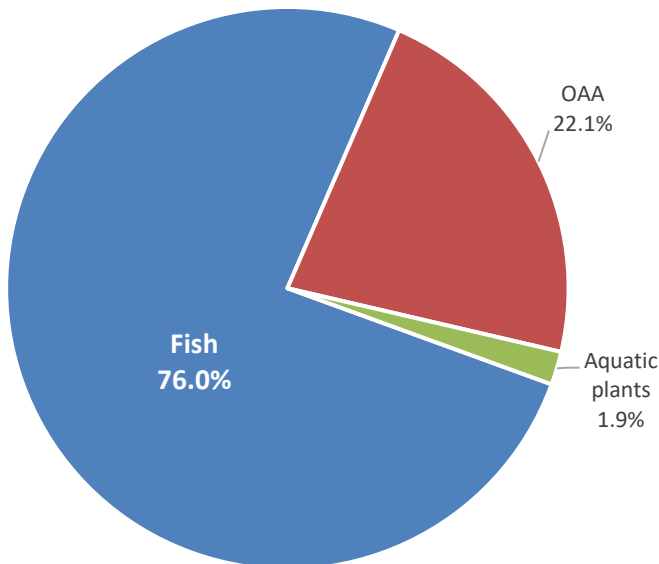| Fishing Area | Sold Kg | % Sold | Consumed Kg | % Consumed | Other use Kg | % Other use |
|---|---|---|---|---|---|---|
| Coastal | 41.0 | 1.1% | 44.5 | 2.8% | 29.0 | 2.8% |
| Floodplain | 441.8 | 12.2% | 307.7 | 19.2% | 247.8 | 23.8% |
| Plateau | 304.6 | 8.4% | 443.0 | 27.7% | 281.2 | 27.0% |
| Tonle Sap | 2,498.2 | 68.9% | 615.6 | 38.5% | 88.0 | 8.5% |
| Mountainous | 340.4 | 9.4% | 188.5 | 11.8% | 394.7 | 37.9% |
| **Grand Total** | **3,626.0** | **57.9%** | **1,599.3** | **25.5%** | **1,040.7** | **16.6%** |

**Figure 4.** Catch contribution for fish, other aquatic animals (OAA) and aquatic plants.

**Table 9.** Top 15 species **by weight** in reported household catch, with weight and proportion of catch by individual species and species groups.

| No. | Scientific name | Khmer name | Catch (kg) | Catch contribution %Catch | Catch contribution %Cum. |
|---|---|---|---|---|---|
| 1 | Mixed small or juvenile fish | ត្រីល្ងិតចម្រុះ | 1,399.9 | 22.3% | 22.3% |
| 2 | *Somanniathelphusa sp.* | ក្ដាមស្រែ | 560.1 | 8.9% | 31.3% |
| 3 | *Puntioplites proctozysron* | ត្រីច្រកែង | 541.5 | 8.6% | 39.9% |
| 4 | *Henicorhynchus siamensis* | ត្រីរៀលតុប | 372.5 | 5.9% | 45.9% |
| 5 | *Channa striata* | ត្រីរ៉ស់/ផ្ទក់ | 320.3 | 5.1% | 51.0% |
| 6 | Aquatic insects nei | វារីសត្វល្ងិត គ្មានក្នុង ក្រុមដ៏ទៃ | 244.0 | 3.9% | 54.9% |
| 7 | *Pomacea canaliculata* | ខ្យង | 224.3 | 3.6% | 58.4% |
| 8 | *Hypsibarbus malcolmi* | ត្រីឆ្ពិនមូល | 220.7 | 3.5% | 62.0% |
| 9 | *Henicorhynchus lobatus* | ត្រីរៀលអង្កាម | 189.2 | 3.0% | 65.0% |
| 10 | *Anabas testudineus* | ត្រីក្រាញ់ | 173.8 | 2.8% | 67.8% |
| 11 | *Hemibagrus spilopterus* | ត្រីឆ្លាំង | 141.4 | 2.3% | 70.0% |
| 12 | *Barbonymus gonionotus* | ត្រីឆ្ពិនប្រាក់ | 139.8 | 2.2% | 72.3% |
| 13 | Snails nei | ខ្យង/ខ្សៅ គ្មានក្នុងក្រុមដ៏ទៃ | 114.9 | 1.8% | 74.1% |
| 14 | *Mystus mysticetus* | ត្រីកញ្ចះធ្មត | 114.2 | 1.8% | 75.9% |
| 15 | *Notopterus notopterus* | ត្រីស្លាត | 100.3 | 1.6% | 77.5% |
| 16 | Other | ផ្សេងទៀត | 1409.3 | 22.5% | |
| | **Total reported catch (kg)** | | **6,266.2** | | |

**Table 10.** Top 15 species **by value** (1000 Riel) for amount sold, with reported value, proportion of value and average price for individual species and species groups.

| No. | Scientific name | Khmer name | Value (1000 Riel) | %Value | Price (Riel/kg) |
|---|---|---|---|---|---|
| 1 | *Puntioplites proctozysron* | ត្រីប្រកែង | 1,995.9 | 12.8% | 7,125 |
| 2 | Mixed small or juvenile fish | ត្រីល្ងិតចម្រុះ | 1,479.1 | 9.5% | 1,800 |
| 3 | *Channa striata* | ត្រីរ៉ស់/ផ្ថក់ | 1,408.8 | 9.0% | 9,900 |
| 4 | *Somanniathelphusa sp.* | ក្ដាមស្រែ | 1,067.8 | 6.9% | 3,150 |
| 5 | *Hemibagrus spilopterus* | ត្រីឆ្លាំង | 809.3 | 5.2% | 11,900 |
| 6 | *Barbonymus gonionotus* | ត្រីឆ្ពិនប្រាក់ | 776.4 | 5.0% | 9,225 |
| 7 | *Hypsibarbus malcolmi* | ត្រីឆ្ពិនមូល | 730.5 | 4.7% | 6,375 |
| 8 | *Pomacea canaliculata* | ខ្យង | 535.9 | 3.4% | 3,325 |
| 9 | *Henicorhynchus lobatus* | ត្រីរៀលអង្កាម | 481.4 | 3.1% | 4,500 |
| 10 | *Notopterus notopterus* | ត្រីស្លាត | 417.0 | 2.7% | 7,575 |
| 11 | Aquatic insects nei | វារីសត្វល្ងិត គ្មានក្នុងក្រមជ័ទៃ | 402.2 | 2.6% | 2,100 |
| 12 | *Mystus mysticetus* | ត្រីកញ្ចុះធ្មត | 380.1 | 2.4% | 6,075 |
| 13 | *Henicorhynchus siamensis* | ត្រីរៀលតុប | 371.5 | 2.4% | 6,375 |
| 14 | Small mixed shrimps | កំពឹសចម្រុះ | 367.3 | 2.4% | 9,725 |
| 15 | *Tilapia sp.* | ត្រីទីឡាព្យា | 363.7 | 2.3% | 8,825 |
| 16 | Other species | | 3,983.95 | 25.6% | |
| | **Total reported value (1000 Riel)** | | **15,570.8** | | |