Urban artisanal fisheries are critical to the social fabric of their communities, particularly along the Mekong River in southeast Asia. Using skill sets, disciplines, and professional insights recently acquired during a marathon three-week undergraduate fisheries science course at Can Tho University (Vietnam) as my platform, I planned and conducted a survey of fishers in the lower Mekong River. Three locations were selected from two distributaries on the Mekong River near its delta in the proximity of Can Tho City. Seventeen fishers agreed to participate in the study and allowed me to participate with them while fishing. Sixteen fishers were over 30 years old, and eight of these were over 50 years old. Mean fisher experience level among the three locations ranged from 15.2 to 30.8 years. Capture techniques typically were small-meshed benthic trawls and larger-meshed gill nets deployed from small wooden boats powered by gasoline engines. Trawl fishers were operative year-round with catches composed primarily of shrimp and small fishes. Gill-net fishers were operative seasonally (during elevated river flows) and focused on large catfishes. The more experienced fishers were more efficient in terms of daily expenses. Their higher catch rates suggested enhanced practical knowledge and understanding of the river’s ecology and its influences on distribution and abundance of the river’s living aquatic resources. Their operational efficiency, coupled with insight into the river’s ecology, added greatly to their income. Fishers who focused specifically on particular fishes (e.g., larger catfishes) seasonally not only had the highest incomes from the fishery but also had several months each year to engage in alternative economic activities during the off-season. This study gave me focus into career possibilities addressing urban artisanal fisheries. Helping fishers achieve economic efficiency can establish trust relationships with fisheries managers that can evolve to also address environmental and natural resources stewardship.

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Describing Urban Artisanal Fisheries in Vietnam’s Lower Mekong River: A Student’s Ventures into Fisheries Science

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INTRODUCTION

Urban artisanal fisheries are increasingly recognized as critical components of the social fabric in their respective communities (Harrison 2014). The resources are nonportable (Brown et al. 1996), and subsequently direct human dependencies evolve that inextricably link the fishers to them (Jackson 2010). As the global human population increases and cities expand, the importance of urban artisanal fisheries will grow, particularly in regions where fish as a source of protein has strong cultural significance. Perhaps in no other part of the world does this exist to the degree that it does in Southeast Asia. In this regard, the Mekong River and its associated fisheries are extremely important to tens of millions of people.

The Mekong River arises on the Tibetan Plateau and courses in a generally southeastern direction across the heartland of Southeast Asia for 4,200 km before discharging into the South China Sea. Along its course, it touches the lives of people in China, Myanmar, Thailand, Laos, Cambodia, and Vietnam. In its lower reaches (Cambodia and Vietnam), as a floodplain river ecosystem, it sustains one of the more important and productive inland fisheries in the world.

In the Mekong River Delta of southeastern Vietnam (Figure 1), capture fisheries play a more important role in food security than in income generation and are more important to lower-income persons than aquaculture (Sultana et al. 2003). However, access to the fisheries resources by the public is primarily via fishers engaged in small-scale commercial (artisanal) fisheries who supply local markets with wild-caught fish. In recognition of this pattern, and in an effort to address the emerging professional opportunities afforded by the river’s fisheries, the College of Aquaculture and Fisheries at Can Tho University initiated partnerships with Auburn University and Mississippi State University to collaborate in enhancement of fisheries science and fisheries management components of its undergraduate curriculum. In conjunction with this initiative, course-related field exercises emphasized local urban (Can Tho City) artisanal fisheries in the river’s distributaries.

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Within an intensive modular format (a full three-semester-hour university course in a three-week marathon), upper-division Can Tho University undergraduate fisheries students are introduced to techniques, disciplines, and laboratory methods necessary to secure, process, and interpret data describing fish assemblages and address population dynamics, conservation biology, yield models, catch assessment survey techniques, river ecology, and socioeconomic considerations. They also are given experience in the field with market surveys and onboard capture techniques employed by local artisanal fishers. The field exercises provide data for developing snapshots of a lower Mekong River urban fishery and opportunity for enhancing competency as well as self-confidence in the emerging cohorts of young Vietnamese fisheries professionals (>100 undergraduate fisheries students in the course during the period 2012–2015).

While a student in the 2015 fisheries science course, I recognized an opportunity to use my newly acquired skill sets, disciplines, and professional insights to address my professional aspirations to work with artisanal fisheries. I wanted very much to work with and for the people who depend on the Mekong River’s resources for their livelihood. Using the framework of the course’s field exercises as a launching platform, I planned and conducted an expanded catch assessment survey on the lower Mekong River. My goals were twofold: (1) to enhance understanding of fisher activities on the river and the relationships extant between fishers and the local urban fisheries resources, and (2) gain experience as a student fisheries biologist in the field working independently on a project that could enhance my professionalism and launch me into additional research addressing small-scale inland fisheries.

METHODS

Three locations were selected from two distributaries of the Mekong River near its delta in the proximity of Can Tho City (see Figure 1). Two of these locations were in the area known as the Hau River (Can Tho City proper and nearby Vinh Long Province). One location was in the area known as the Co Chien River in the vicinity of Vinh Long City. Seventeen fishers agreed to participate in the study following explanation of data to be collected and how the data would be used. They were assured of confidentiality.

In order to understand the logistics and techniques employed by these fishers, I joined them during several of their fishing trips. The fishers were increasingly supportive of my efforts and purposes as our trust relationships evolved over time. As this happened, they provided me with additional information regarding not only their fishing but how they integrate fishing into their family lives and the social fabric of their respective communities.
The capture techniques employed typically were small-mesh benthic trawls and larger-meshed gill nets deployed from small wooden boats powered by gasoline engines. All of the fishers were men. Typically, they were assisted by other family members. Of the seventeen fishers I worked with, 16 were over 30 years of age and half of these were more than 50 years old. All were fishers with years of experience in the fishery and profound historical perspective and insight.

In addition to allowing me to use a survey instrument to ask questions about their fishing, the fishers participating in the study invited me to accompany them onboard to experience and document their techniques. When I was onboard, trawling was conducted for 15-minute periods at depths that ranged from 4 to 25 m. Each sample’s catch was maintained as a consolidated sample (shrimp and fish combined), stored on ice (particularly shrimp), and later sorted and processed for sale at local fish markets.

Fishers deploying gill nets tended to be more seasonal with this gear and focused primarily on large catfishes. As with the trawl fishers, I was invited to participate in the gill-net fishery. These nets were deployed at various depths and were continuously monitored both to ensure that fish were recovered quickly when caught and to avoid theft of gear and fish. Ice was commonly used to enhance marketability of captured fish.

<table>
<thead>
<tr>
<th>Location</th>
<th>Number of years fishing</th>
<th>Hours/day</th>
<th>Days/month</th>
<th>kg/day</th>
<th>Price/kg</th>
<th>Expenses/day</th>
<th>Estimated net income/day</th>
<th>Estimated annual income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tra Vinh Province (N = 6): Seasonal targeted gill-net fishery for large catfishes, November–July</td>
<td>Mean</td>
<td>24.7</td>
<td>6.7</td>
<td>30.0</td>
<td>21.5</td>
<td>$5.13</td>
<td>$1.53</td>
<td>$108.77</td>
</tr>
<tr>
<td></td>
<td>SE</td>
<td>4.1</td>
<td>2.7</td>
<td>—</td>
<td>8.8</td>
<td>$2.09</td>
<td>—</td>
<td>$0.62</td>
</tr>
<tr>
<td>Can Tho City (N = 5): Nonselective year around trawl fishery for small fishes and shrimps</td>
<td>Mean</td>
<td>15.2</td>
<td>11.0</td>
<td>20.0</td>
<td>10.0</td>
<td>$3.04</td>
<td>$12.40</td>
<td>$18.00</td>
</tr>
<tr>
<td></td>
<td>SE</td>
<td>6.8</td>
<td>4.9</td>
<td>8.9</td>
<td>4.5</td>
<td>$1.36</td>
<td>—</td>
<td>$5.53</td>
</tr>
<tr>
<td>Vinh Long City (N = 6): Nonselective year around trawl fishery for small fishes and shrimps</td>
<td>Mean</td>
<td>30.8</td>
<td>11.8</td>
<td>20.7</td>
<td>26.7</td>
<td>$1.43</td>
<td>$2.08</td>
<td>$36.10</td>
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<tr>
<td></td>
<td>SE</td>
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<td>4.8</td>
<td>8.4</td>
<td>10.9</td>
<td>$0.58</td>
<td>—</td>
<td>$0.85</td>
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</tbody>
</table>

The author, Vo Le Gia Linh, engaged in conducting catch assessment surveys of artisanal fishers in the lower Mekong River, southeastern Vietnam. Photo credit: Le Bui Bao Chau.
fishers I encountered during my study. Their fishing activities were similar to those of Can Tho City fishers in terms of hours per day and days per month. However, their daily and annual incomes were approximately twice the earnings of the Can Tho City fishers, even though the price Vinh Long City fishers received for their catch was 50% less compared to Can Tho City fishers. The Vinh Long City fishers had operational costs that were not significantly different from those of the Tra Vinh Province fishery. Experience in the fishery was probably the reason for increased operational efficiency and higher incomes. As was the case for Can Tho City fishers, the Vin Long City fishers engaged in multiple fishing trips per day in order to sell their catch fresh (on ice).

**SUMMARY INSIGHTS**

I determined that the experience level of fishers on the lower Mekong River had a very positive influence on catch rates and income. The more experienced fishers were more efficient in terms of daily expenses. Their higher catch rates suggested enhanced practical knowledge and understanding of the river’s ecology and its influences on distribution and abundance of the river’s living aquatic resources. Their operational efficiency, coupled with insight into the river’s ecology, added greatly to their income. Additionally, fishers who focused specifically on particular fishes (e.g., larger catfishes) seasonally not only had the highest incomes from the fishery but also had several months each year to engage in alternative economic activities during the...
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REFERENCES


