Status of the Eel Industry Along the Abra River

Alma B. Segismundo
Petronila E. Florendo

Abstract

This study assessed the status of the eel industry along the upper and lower Abra River. Specifically, it determined the socio-demographic and socio-economic characteristics and marketing practices of the fishermen respondents; status of the eel industry in terms of seasonality, average catch per fishing effort, and type of substrate; and the problems encountered in eel fishing.

The descriptive method of research was used with the questionnaire checklist as the main tool in data gathering, supplemented with personal interviews. The study was conducted from April to December 2003.

Proportional random sampling was used to determine the mumber of respondents. A total of 256 fishermen representing 13 municipalities served as the respondents.

Most of the fishermen along the Abra River are male, married with 3-4 children and did not finish secondary education. Majority of the fishermen have been involved in the fishing industry for nine or more years, of which most of the family members are also involved in fishing. The fisherman respondents claim insufficiency of income from fishing, falling below P1,000.00 per month. To augment their meager income from fishing, most of the fishermen raise livestock. Although most of them live simple lives, they own their houses and have appliances like radio, electric fan and television sets.

In terms of marketing practices, most of the fishermen sell their eel catches in their own municipalities with prices ranging from P240-300 per kilo, with an average of 2-2.5 kilogram sold per week during the peak season.

Eels come out mostly during the rainy season. Most of the respondents indicated a 0.25-0.5 kg. catch per fishing effort and prefer to catch eel during night time in stony substrates.

All of the respondents claim a decline in eel catch.

On problems encountered in eel fishing, electrofishing and other illegal fishing practices came out as the number one problem, followed by indiscriminate fishing which resulted in very small-sized eel catch, and the ever-increasing number of fishermen which results in lesser catches.

The researchers strongly recommend that authorities should see to it that the policies on the proper utilization of the Abra River's resources are strictly implemented. There should also be an outreach program of these implementing agencies and academic institutions to educate fishermen on the consequences of illegal fishing practices, the effects of indiscriminate fishing and other matters that would improve the eel industry along the Abra River. These programs should be done from time to time until the fishermen have imbibed proper fishing practices.

Introduction

Background of the Study

The Philippines is a very fortunate country for it possesses a lot of natural resources one of which is fishery resources that supply fish and other fish products abundantly for the ever-increasing population. The Filipinos are basically fish and rice-eating people, thus making fishing one of the vital sources of their livelihood. Moreover, fish has been regarded as a stable, dependable, and nutritious food whether from the sea or fresh water.

Rivers convey excess water directly to oceans. Collectively, they represent the world's water resources as they carry virtually all the water that arc available for human management and use (Grolier Encyclopedia of Knowledge, 1998). One of the largest rivers of Northern Luzon is the Abra River which has formed an extensive and rich valley. It flows northward and changes its course westward to its mouth going directly to the mass of seawater, the China Sea.

As per observation, our coastal and inland fisheries are facing some serious problems one of which is the indiscriminate use of the so-called riverine culture. Gone are the days when one can transparently see the graceful movements of different fish species in our rivers. Today, the clean and transparent water has turned to a green and muddy structure caused by siltation, erosion and quarrying.

The Abra river is not an exemption. As one moves down and upstream to the rivers, the greenish to brown color of the water signifies the presence of

impurities caused by peculiar disturbance to the desired purity of the water. The long range which was once a pride of the municipalities of Lagangilang. Abra and Caoayan, Ilocos Sur is now a scenario of deteriorating sanctuary of very rare but sturdy species of shells and fishes that have amazingly survived.

The Southeast Asian eel *(Anguilla* spp) is a fresh water fish that lives in rivers where it spends 8-15 ycars of its life before migrating to the deep sea to breed and eventually die.

Eels arc rich in protein; they are very nutritious. They are popular and arc considered as exotic food in many countries including the Philippines. Knowing the delectable taste of eels, Ilocanos prepare them into "adobo" "dalangdang" and "inihaw" styles. Eel catches in Abra and Ilocos Sur usually come from the Abra River. Catches of this fish species from the said river used to be very abundant, but now the exorbitant price go as high as P350.00 per kilo. The catches seldom reach the public market and only the "moneyed" people can enjoy their exotic taste.

Nowadays, eels are no longer as abundant as they were before. The deteriorating eel resources have led to the use of more efficient but often destructive fishing methods such as the use of dynamite, poisonous substances, and other illegal fishing methods.

This study is deemed important and meaningful in the sense that it will provide local fishermen information on the present status of the eel fishery along the Abra River. Furthermore, data would also enable resource managers and decision makers to plan and implement rational judgments as to the proper disposition or allocation of this resource for protection when it is in danger of depletion.

Objectives

This study assessed the status of the eel industry along the upper and lower Abra River.

Specifically, it aimed to:

a. determine the socio-demographic and socio-economic characteristics and marketing practices of fishermen along the Abra River;
b. determine the status of the eel industry along the Abra River in terms of seasonality, average catch per fishing effort, and type of substrate ; and
c. determine the problems encountered in eel fishing

Review of Related Literature

Eels make up the order Anguilliformes. Freshwater eels make up the Family Anguillidac, comprising 600 diverse species and grouped into about 22 families. Most eels have no scales and arc protected by a layer of slippery mucus. Their dorsal and anal fins, which run from close to the head to the often non-existent tail fin, provide much of the thrnst for these lithe and strong swimmers. Most species arc less than I meter long. The females of some species can grow from 1-2 meters. The conger eel, however, grows to 3 meters. Eels are found in waters as deep as 427 meter (1,400 feet) when breeding.

Freshwater eels return to the ocean to spawn. These eels, which are considered as important food and are sold in markets in some countries, have dense capillary systems close to the skin that can absorb directly air or water. The eels hatch from eggs or leptoccphali, which arc transparent, very thin, bag-like, bearing little resemblance to the adults. They drift about the ocean surface for as long as three years, then develop into round-bodied young eels called elvers, or glass ells, until they reach full size. By this time, they accumulate in great numbers at the mouths of rivers. The yellow elvers swim upstream and feed on lake-and river-bottom animals until they become black-and-silver bodied adults, completing the cycle.

Eels range in size from three inches to over three feet long. The females are much larger than the males. They prefer muddy bottoms and calm waters. They are nocturnal which means they arc active at night. During the day, eels hide under the bottom of rocks. They eat a variety of fish, insects, snails, clams, and wonns (hp://ywdnr_statg.r:d 1).

The American eel population has been declining in recent years. This is the result of several factors, notably dam construction and harvesting. Movement around major barriers causes the fish greater stress and may increase its susceptibility to predation. The eel is also being increasingly harvested for food. The young elvers can fetch a world market price of up to 600 dollars per pound. Management activities include construction of eel passes (for enabling upstream juvenile eel movement around dams) and enumeration of immigrating eels w.3is.go/rj.re).

In a study conducted by Segismundo and Felicitas in 1999 on the edible fauna of some rivers in Abra and Ilocos Sur, eel was identified as one. This resource can be found in Tineg and Malanas Rivers, both tributaries of the Abra River.

A study by Bagayan et al in 2000 on the assessment of the edible fishes along the lower portion of the Abra River identified eel as one of the resources. A weekly average catch of 1.73 kg of eel caught per fishing effort from Area I which included barangays in Banaoang, Namalangan, Rizal, Ampandula and Mabilbila Sur of Santa, llocos Sur, showed a higher data than in Area II with only 0.125 kg which included the barangays of Puro, Caoayan, Oribi, Calumbuyan, Rancho, and Tabuculan of Santa, Ilocos Sur.

Methodology

This study made use of the descriptive method of research with the questionnaire checklist as the main tool in data gathering, coupled with personal interviews with the fisherman-respondents to complement or justify the responses. Data gathering was done from April-December 2003.

Proportional random sampling was used to select the respondents from nine municipalities along the upper Abra River; namely, Lagangilang, Dolores, Tayum, Bangued, Bucay, Manabo, Luba, Pidigan, and San Quintin and four municipalities along the lower portion of the Abra River which included Santa, Bantay, Vigan, and Caoayan. A total of 256 fishermen representing 13 municipalities were the respondents of this study.

Frequency count and mean were used in the statistical treatment of the data gathered.

Results and Discussion

Table Ia. Socio-demographic profile of the respondents

CHARACTERISTICS		NUMBER OF RESPONDENTS (256)
Sex	Female	1
	Male	255
Civil Status	Single	58
	Married	193
	Widow/er	3
	Separated	2
Number of Children	9-above	4
	7-8	I4
	5-6	57
	3-4	74
	1-2	44

Table 1 continued

CHARACTERISTICS		NUMBER OF RESPONDENTS (256)
Educational Attainment	Did not attend school	17
	Did not finish elementary	36
	Elementary graduate	40
	Did not finish high school	74
	High school graduate	63
	Did not finish college	20
	College graduate	6

As reflected in the table above, there is only one (I) female among the 256 fisherman-respondents. Most of them (193) are married, and 58 of them are single. On educational attainment, 74 of them did not finish high school but 63 are graduates of high school education. Twenty (20) of them reached college level education but only six (6) graduated. There are 36 of them who did not finish elementary education, and 17 did not have any formal education at all. Among the 193 married fishermen, 74 of them have 3-4 children; 57 have 5-6; 44 have I-2; I4 have 7-8; and four of them have nine or more children.

Table Ib. Socio-economic profile of the respondents.

CHARACTERISTICS		NUMBER OF RESPONDENTS
Number of Years of Fishing	9-above	174
	7-8	33
	5-6	7
	3-4	25
	1-2	17
Number of Family Members Involved in Fishing	5-above	1
	4	0
	3	15
	2	51
	1	189
Monthly Income From Fishing	4,000-above	0
	3,000-3,999	1
	2,000-2,999	6
	1,000-1,999	35
	Below 1,000	214

Table Ib continued

CHARACTERISTICS		NUMBER OF RESPONDENTS
Monthly Income Aside from Fishing	4,000-above	5
	3,000-3,999	13
	2,000-2,999	14
	1,000-1,999	62
	Below 1,000	**162**
Sources of Income Aside from Fishing	Farming	94
	Driving	13
	Carpentry	37
	Livestock Management	**117**
	Basket weaving	8
	Government employee	1
Type of House Ownership	**Owns**	**229**
	Rents	0
	Stays as caretaker	4
	Stays with parents/in-laws/relatives	23
Type of House	**Permanent**	65
Bungalow	Semi-permanent	58
	Temporary	42
Two-storey	Permanent	30
	Semi-permanent	45
	Temporary	16
Appliances owned	**Radio**	**240**
	TV	129
	Electric fan	119
	Cellular phone	71
	Refrigerator	39
	VCD	32
	Flat iron	32
	Washing machine	14
	Component	13
	Electric water pump	**1**
Sufficiency of Income	Sufficient	52
	Not sufficient	**204**

From the table, majority (174) of the fishermen have been involved in the fishing industry for nine or more years. One hundred eighty-nine have one member of their families involved in the fishing industry; 51 with two members; 15 with three; and one of them with five or more members.

Two hundred fourteen of the respondents indicah:d that their monthly income from fishing is below PI,000.00. Only 35 indicated their income within the P1,000.00-P1,999.00 bracket; six of them in the P2,000.00-P2,999.00 income bracket; and only one in the P3,000.00-P3,999.00 income bracket.

To augment their meager income from fishing, 199 of the respondents raise livestock: 94 do farming; 37 do carpentry; 13 do driving for others; eight arc into basketwcaving; and one of them is a government employee.

Nobody among the respondents rents a house. Two hundred twenty-nine (229) of them own a house, and only 23 of them live with either the parents, in-laws, or relatives. Of the respondents whose houses arc of bungalow type, 65 have permanent type; 58 have semi-pennanent type, and the rest, 42, have temporary structures. As to those who have two-storey type of houses, 45 have semi-permanent structure; 30 with permanent structure, and only I6 have temporary structures.

Most of the respondents (240) own radios; 129 of them have television sets; 119 have electric fans; 71 have cellular phones; 39 have refrigerators; 32 with VCDs and flat irons; 13 with components; and only one of them own an electric water pump.

Two hundred four of them have indicated that their income from fishing is not sufficient for the whole family, whereas only 52 indicated sufficiency of income.

Table 2. Marketing practices of the fisherman-respondents

PRACTICE		NUMBER OF RESPONDENTS
Where to sell eel catch	**Within municipality**	205
	Other municipalities	34
	Other provinces	17
Selling Price per Kilo Range	**P250.00-300.00**	184
	220.00-240.00	6
	180.00-200.00	43
	120.00-150.00	3

Table 2 continued

PRACTICE		NUMBER OF RESPONDENTS
Average Kilos Sold Pcr Weck During Peak Season	8.0-above	IO
	6.0-7.0	5
	3.0-5.0	67
	2.0-2.5	**152**
	0.75-1.0	17
	0.25-0.5	5
Type of Buyer	**Rich**	**256**
	Poor	0

As reflected in the table, 205 of the fishennen sell their eel catches in their own municipality; 34 of them sell their catches to nearby municipalities; and only 17 of them go to other provinces.

One hundred eighty-four of them sell their eel catches per kilo on the range of P250.00-300.00; forty on the range of PI80.00-200.O0; six on the P220.00-240.00 range; and three on the range of PI20.00-150.00.

In terms of average kilo sold per week during the peak season, many of the respondents (152) indicated that they are able to sell between 2 and 2.5 average kilos per week; 67 of them sell an average of 3-5 kilos; only IO of them sell an average of eight kilos and above.

All of the fishermen sell their eel catches to those who are considered rich.

Table 3a. Status of the eel industry

PARAMETER		NUMBER OF RESPONDENTS
Month of Occurrence	**May-June**	**134**
	June-August	27
	July-October	68
	November-May	22
	January	5
Average catch per fishing effort (kg)	5.0-above	**l**
	2.0-3.0	16
	0.75-1.0	109
	0.25-0.5	**130**

Table a continued

PARAMETER		NUMBER OF RESPONDENTS	
Time of day for fishing	**Night Time**	**126**	
	Anytime	44	
	Afternoon	64	
	Morning	22	
Substrate	Sandy	0	
	Muddy	37	
	Stony	219	
	Total		**256**
Observance of decline in catch	Yes	**256**	
	No	0	
	Total		**256**

From the questionnaires gathered, the answers of the respondents give a clear picture of the status of the eel fishery along the Abra River and these are reflected on the table above.

Fishermen (134 of them) from the upper portion of the river claim that eel catches come out in May and June, but at the lower portion of the river, 68 of them say that eel catches occur from July to October; 27 of them say June to August; 22 claim it is done from November to May; and five of them say it is during the month of January.

Many of the fishennen (130) indicated that"they have 0.25-0.5 kg catch per fishing effort; 109 of them indicated 0.75-1.0 kg average catch per fishing effort; 16 of them indicated 2.0-3.0 kg average catch per fishing effort; and only one of them indicated 5.0 or more kg average catch per fishing effort.

One hundred twenty six of the fishermen prefer to catch eel during night time; 64 of them prefer in the afternoon; and 44 go fishing anytime of the day. Only 22 of them do fishing in the morning.

Majority of the fishermen (219) say that there are more eel catches in stony substrates. Only 37 fishermen answered that they get their catches in the muddy substrate and none of them answered sandy substrate.

All of the fishermen have observed that there is a decline in the eel catches already.

Table 3b. Problems Encountered in Eel Fishing Along Abra River

PROBLEM	NUMBER OF RESPONDENT
Hard to catch due to the fish's ferocity and its slippery skin	35
No fishing gear to use	41
Electrofishing and other illegal fishing practices	189
Lack of knowledge on proper fishing	27
Seldom catch large eels because of indiscriminate fishing	163
Increase in the number of fishennen	146
Increase in water temperature	73
Decrease in the depth of the water	71
Hard to find eels because they thrive in the deeper areas of the river	52

Electrofishing and other illegal fishing practices came out as the number one problem in the eel fishery along the Abra River as shown by 189 of the fisherman-respondent. This is followed by the indiscriminate fishing problem wherein fishermen have noted that it is very seldom that there are catches of large-sized eels. One hundred sixty three of the fishermen have indicated this problem. A big number of them (146) also have experienced the problem on the increase in the number of fishermen involved in eel fishing leading to lesser catch for each of them. The rest of the problems indicated by the ever-decreasing number of the respondents are as follovs: increase in water temperature (73); decrease in the depth of water (71); hard to find because eels thrive in deeper areas of the river (52); no fishing gear to use (41); and hard to catch due to the eels ferocity and its slippery skin.

Conclusions

Of the 256 fishermen along the Abra River involved in eel fishery, 255 are males; only one female. Almost all of them are married. While seventeen of the respondents did not have any schooling, 3 are graduates of high school education, and only six are college graduates. The number of children of many of the married respondents are in the brackets of3-4 and 5-6.

Majority of the respondents have been engaged in the fishing industry for nine years and above, and have at least one member of their families involved in fishing, too. The fishermen have indicated that the average monthly income of below Pl,000 from fishing and the same average from other sources of income

(mostly livestock management, farming, and carpentry) arc not sufficient for their families.

Despite the above situation, majority of the respondents own the house they are occupying. The structure of their bungalow and 2-storey house types vary from permanent to semi permanent to temporary. Many of them too, own radios, television sets, and electric funs. Some own cellular phones, refrigerators, electric tlat irons, and VCDs.

According to most of the fishermen, they sell their eel catches in their own municipality although some would still travel to sell them in other municipalities.

Most of the respondents indicated that during the peak season, an average of 2.0-2.5 kilos are sold per week and the selling price ranges from P250.00-300.00.

Fishermen from the upper portion of the river said that eels abound from May to June whereas most of those from the lower portion said that eels are plentiful from July to October. Many have indicated 0.25-0.5 kg as their average catch per fishing effort. Most of them go fishing eels at night time and at the stony substrates. All of them observe that there is already a decline in eel catches.

Among the many problems associated with the eel fishery along the Abra River, electrofishing and other illegal fishing practices came out as the foremost followed by the problem on indiscriminate fishing leading to scarcity of large eels and the problem on too many fishermen competing with each other on the fish catches.

Recommendations

The researchers strongly recommend that concerned authorities should see to it that their policies on the proper utilization of the resources of the Abra River are strictly implemented. There should be an outreach program to be implemented by indiscriminate concerned agencies and academic institutions in order to educate fishermen on the consequences of indiscriminate or illegal fishing practices and other matters that would improve the eel industry along the Abra River. These programs should be done from time to time until the fishermen have imbibed proper fishing practices.

References

Bagayan, C. et al. 2000. *Assessment of the Edible Fishes Along the Lower Portion of Abra River*. Unpublished undergraduate thesis.

Segismundo, A. and A. B. Felicitas. 2000. *The Edible Fauna of Some Rivers in Abra and Ilocos Sur*. Unpublished Research. University of Northern Philippines, Vigan City.

Viscarra, F.O. 2003. *Introduction to Educational Research*. Quezon City, Philippines: Great Books Trading,

http://yyyy.,dgr.state.md,us

www.fws.gov/r5crc