

# Fishery Barometer Surveys Prospects for Finnish Fisheries

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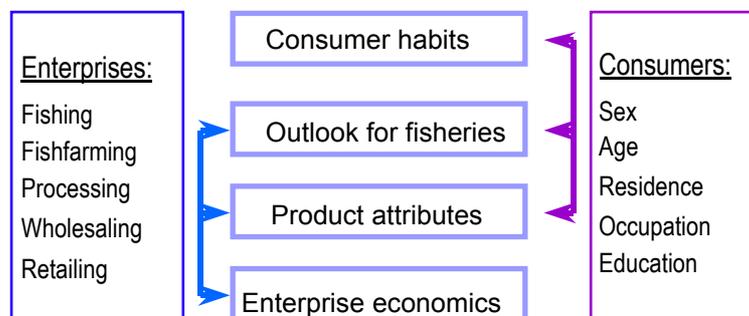
**Abstract.** Fishery barometer is a follow up survey that measures and analyses simultaneously consumers' and producers' opinions about fish products, fisheries and production environments. The barometer also establishes a platform for a traditional business survey of the economic outlook for fishery enterprises. The fishery barometer aims to collect data that are reliable and comparable in the long term. To assess the quality of our survey system in advance, the development process was divided into three parts. First, the content and intelligibility of the questionnaire were tested by think-aloud methods with a test group in a cognitive survey laboratory. Second, a pilot study was set up to test the survey in practice on the target population. Finally, the regular collection of follow-up data was begun in February 2000. To date three annual surveys have been conducted. Each time, the sample size has comprised about 2 000 consumers and 350 enterprises countrywide. Data have been collected through computer-based phone interviews. The results for enterprises can be divided into fishing, aquaculture, processing, wholesale and retail sectors, and into domestic and foreign operators, turnover classes, and regions. The results for consumers can be grouped according to socio-economic variables, such as age, sex, education and residence. The results of the barometer have been warmly welcomed by administration, business, research and fishery-related interest groups.

**Keywords:** barometer, survey, fishery enterprises, consumers, fish product

## 1. INTRODUCTION

Fishery barometer is established to examine the views of fishery enterprises and consumers on fisheries and fish products. This paper presents the development of the data collection system and the methods used to conduct regular surveys. The results of the Fishery barometer are review for instance by Ahvonen & Honkanen (2000, 2001a, 2001b, 2002) and by Honkanen & Ahvonen (2000, 2001a, 2001b, 2002a, 2002b).

The barometer survey is targeted at the entire chain of supply and demand in fisheries. Fishing, aquaculture, processing and the wholesale and retail trade represented supply; demand is represented by consumers. Consumers and enterprises are asked simultaneously to give their opinions on the outlook for fisheries and product attributes (see Honkanen & Ahvonen 2002b). Besides that, the consumers are asked to evaluate their fish and sea-food consumption frequency. The enterprises are asked to estimate their economic performance and outlook by means of a traditional business survey (e.g. European Commission 1997). The analysis frame of regular follow-up data collection is presented at figure 1.



**Figure 1.** The analysis frame of regular follow-up data collection.

The fishery barometer survey aims to collect data that are reliable and comparable in the long term. To assess the quality of the survey system in advance, the process was divided into three parts. First, the content and intelligibility of the questionnaire were tested by think-aloud methods with a test group in the survey laboratory

of Statistics Finland. Second, a quantitative pilot survey was set up to test the data collection in practice on the target population. Finally, the annual collection of follow-up the data was begun in February 2000 (fig. 2).

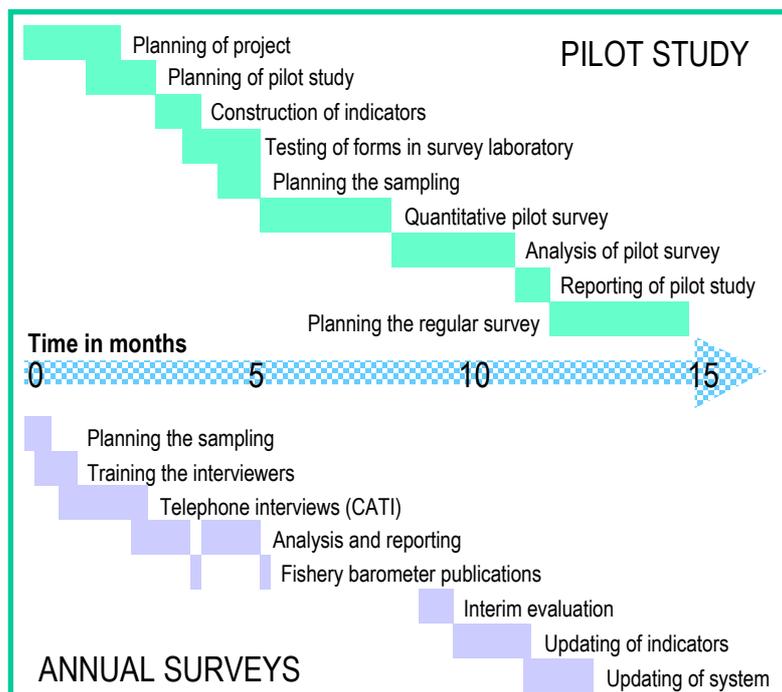


Figure 2. Time scale of the pilot study and annual surveys

## 2. MATERIAL AND METHODS

### 2.1. Pilot study

The barometer survey was preceded by a pilot study in which the indicators and the data collection system were tested in co-operation with Statistics Finland (fig. 2) (Ahvonen & Honkanen 1999). The indicators were planned making use of the survey laboratory of Statistics Finland. A test group assessed the content, intelligibility and interpretability of the form with a cognitive pre-test utilizing think aloud methods (cf. Ericsson & Simon 1984, Sudman et. al. 1996, Tourangeau et. al. 2000, Willis 1994, Willis et. al. 1999). A qualitative validity analysis for the question attributes was also implemented (Godenhjelm et al. 2000).

After the indicators were developed, the whole data collection system was tested by interviewing 53 entrepreneurs and 425 consumers in southern Finland (fig. 2) (Ahvonen & Honkanen 1999). Since the consumers were interviewed in the course of the consumer survey conducted by Statistics Finland, the information system developed for that survey over several years could be made use of here, too.

### 2.2. Survey population and sample

*The survey population for enterprises* consists of all those fisheries sector enterprises on the business register of Statistics Finland whose annual turnover exceeded € 8400. Thus the survey population has comprised a total of about 1000 firms and entrepreneurs. The sample size has been 350 every year. The firms that had ceased operations or that could not be contacted have been removed from the sample as over-coverage. The final net sample thus has included about 300 enterprises. For instance in 2002, 88 % of the enterprises took part in the interviews. The sample has been allocated to fixed quotas to ensure a sufficient number of observations of all strata (tables 1 and 2).

*The survey population for consumers* consists of Finns, 15-74 years of age, listed in the Central Population Register at the previous year. The sample has contained 2200 consumers every year. Those who had been deceased or living permanently abroad have been removed from the sample as over-coverage. The number of interviewed consumers has been 1 500-1 600 every year. The response rate was 73.4 % in 2002 (table 2).

Comparison of those participating in the and the survey population by sex and age group shows that the sample of the year 2002, for instance, represents the survey population very well (table 3).

**Table 1.** Survey populations, samples, non-response and response rates in 2002.

|                   | Enterprises |       | Consumers |       |
|-------------------|-------------|-------|-----------|-------|
|                   | N           | %     | N         | %     |
| Survey population | 950         | 100.0 | 3 904 373 | 100.0 |
| Sample            | 350         | 36.8  | 2 200     | 0.06  |
| Overcoverage      | 23          | 6.6   | 8         | 0.3   |
| Net sample        | 327         | 100.0 | 2 192     | 100.0 |
| Nonresponse       | 40          | 12.2  | 582       | 26.5  |
| - no contact      | 9           | 2.7   | 373       | 17.0  |
| - refusal         | 15          | 4.6   | 168       | 7.6   |
| - other reason    | 16          | 4.9   | 41        | 1.9   |
| Response          | 287         | 87.8  | 1 610     | 73.4  |

**Table 2.** Sampling fractions of the enterprises ( $n/N$ =sample/survey population) and final response percentages by sectors in 2002.

| Sector       | Sampling fractions, $n/N$ | Response % |
|--------------|---------------------------|------------|
| Fishing      | 67 / 383                  | 91.0       |
| Aquaculture  | 87 / 214                  | 92.0       |
| Processing   | 63 / 147                  | 87.3       |
| Wholesale    | 55 / 83                   | 83.6       |
| Retail trade | 55 / 123                  | 81.8       |
| Total        | 327 / 950                 | 87.8       |

**Table 3.** Consumers participating in the study and the survey population in 2002, i.e. Finns, 15-74 years of age, by age and sex (%).

| Age group | Participating Females | Survey population Females | Participating Males | Survey population Males |
|-----------|-----------------------|---------------------------|---------------------|-------------------------|
| 15-24     | 18.3                  | 16.4                      | 16.3                | 17.3                    |
| 25-34     | 15.1                  | 16.3                      | 17.0                | 17.2                    |
| 35-44     | 20.0                  | 19.1                      | 19.5                | 19.9                    |
| 45-54     | 18.9                  | 20.9                      | 22.5                | 21.5                    |
| 55-64     | 16.4                  | 14.8                      | 15.8                | 14.3                    |
| 65-74     | 11.4                  | 12.5                      | 8.9                 | 9.9                     |
| Total     | 100.00                | 100.0                     | 100.0               | 100.0                   |
| N         | 800                   | 1 959 601                 | 810                 | 1 944 772               |

### 2.3. Interviews

Consumers and entrepreneurs have been interviewed simultaneously by the computer-aided telephone interview system (CATI) of Statistics Finland. Consumers have been interviewed in conjunction with the consumer survey of Statistics Finland (cf. Statistics Finland 2002) and entrepreneurs separately.

Enterprises and consumers included in the sample have been informed beforehand by letter about the interview and its content. The interviews with enterprises have been held with a representative of management. The mean interview time for consumers has been 8-12 minutes and for enterprises 13-15 minutes. The formulation and content of the interview questions has followed the general practices of consumer and industry barometer surveys (e.g. European Commission 1997).

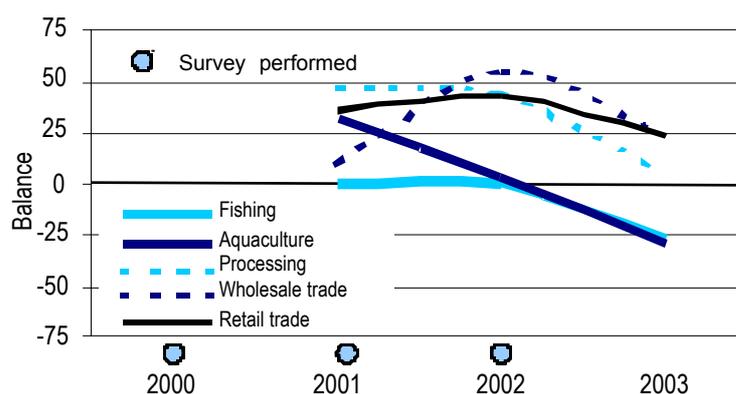
## 2.4. Processing and presentation of data

The results for enterprises and consumers have been estimated to correspond to the survey population by weighting all the measuring data by the stratum-specific sampling fractions and response probability (non-response) at unit level. The weighting coefficients at unit level have been calibrated to make the estimated marginal distributions of the age, sex and area of residence of a person correspond to those for the whole survey population, i.e. the population structure. The enterprises have been calibrated on the basis of their turnover (e.g. Deville and Särndahl 1992, Deville et al. 1993).

To make the survey results easily accessible, the results are presented as balance figures. Basically the balance figures show the difference between positive and negative percentages. Balance figures are obtained by summing the weighted response percentages using the methods generally applied in surveys (e.g. European Commission 1997, Statistics Finland 2002). The values of the balance figures can range between -100 and 100. In the balance calculations the response options have been assigned the following weight coefficients:

| Agree/<br>Highly probable | Partly agree/<br>Fairly probable | Don't know | Partly disagree/<br>Fairly improbable | Disagree/<br>Highly improbable |
|---------------------------|----------------------------------|------------|---------------------------------------|--------------------------------|
| + 1.0                     | + 0.5                            | 0.0        | - 0.5                                 | - 1.0                          |

To summarize the enterprise economics, the results are presented also as indicators, that are loaded with questions concerning financial standing, turnover and investments of the enterprises (see Ahvonen & Honkanen 2000, 2001a, 2002, Honkanen & Ahvonen 2001b). An example of the presentation of the indicator results is given at figure 3.



**Figure 3.** An example of the presentation of the results by Ahvonen & Honkanen (2002).

The figure shows economic confidence indicator for the *next 12 months* in February 2000, 2001 and 2002. Confidence indicators are loaded with questions concerning financial standing, turnover and investments of the enterprises, and the indicators are calculated as means of the balance figures of these questions.

## 3. DISCUSSION

### 3.1. Reliability

A special interest has been paid to reliability and validity of the measurements. Use has been made of the information on the structure of the survey population (e.g. turnover of enterprises, and age, sex and place of residence of consumers) to plan the sampling and fixing of quotas appropriately. Coverage error has been reduced by removing the over-coverage from both samples in conjunction with the interviews. It has not been not possible to estimate the under-coverage for enterprises, but clearly new enterprises at least have not been on the register.

Some under-coverage has also occurred for consumers, due to the time difference between the interviews and the register updating, which in this case has been about one year. The non-response rate has been low for enterprises and moderately low for consumers compared with interviews in general. The bias caused by non-response could have been reduced to some extent with the methods applied (stratification and calibration).

The amount of the sampling error has been controlled by calculating 95% confidence intervals for the individual questions. The confidence intervals for the whole enterprise data have been about  $\pm 5$  percentage points, depending on the question. The confidence intervals for the consumer responses have been  $\pm 2.5$  percentage points at their highest. The survey indicators have been formulated as they usually are in barometers and their response options were simple. Moreover, the indicators had been tested for performance in a pilot study conducted in co-operation with Statistics Finland, which reduced the possibility of errors in measurements. According to the interviewers, the respondents have understood the questions well.

Barometer surveys generally measure change. Of importance is not the individual results but the changes occurring between the measuring times. The present results are based on a three measuring time, which sets limits on the interpretation in terms of time. Note too, that although barometers are widely used to study the expectations of social phenomena, they are not prognoses as such but rather tools that help us estimate trends. The intention is to repeat the survey in 2003.

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