MANAGING FISH MARKET INFORMATION SYSTEM FOR INDUSTRY USE 
AND ECONOMIC RESEARCH

Frank F. Chiang
and
David S. Liao
Institute of Fisheries Economics
National Taiwan Ocean University
Keelung, Taiwan 20224, R.O.C.
fehiang@fishecon.ife.ntou.edu.tw

ABSTRACT: This paper briefly describes the Taiwan Fish Market Information System (TFMIS) which was designed to provide the timely fish market information, especially the prices and the forecasting prices, to fishery producers, fishery industry, fishery organizations, government, academic institutes, and consumers. Information can be accessed through a standard touch-tone telephone and a modem. Currently, TFMIS has a database system which stores up-to-date Taiwan fish market information. It includes fishery production by year and species, fishery values by year and species, the import and export of fishery products by country, species, and production, and the forecasting prices and production for over 20 major fishery products in Taiwan. In the long run, TFMIS’s database will include several selected countries’ fish market information, such as Canada, Japan, Mainland China, Norway, and U.S. etc.

Both figures and graphs are provided for each product. In addition to the on-line information inquiry, information is also available through weekly newsletter and fax to those people who are interested in fishery market information and do not have a micro-computer.

Partial data were collected daily from the wholesale markets, retail markets, and major supermarkets throughout Taiwan area. In the short run, TFMIS can provide unbiased market information and prices predictions for the producers of Tilapia and Milkfish. Over time, TFMIS can help: 1) producers to manage their production plans, 2) marketers to develop their marketing strategies, 3) government to formulate fishery policies, and 4) academic researchers to obtain data sources.

INTRODUCTION

Nowadays, the computer is a very useful tool in our daily life and can be used to analyze data and also to provide help for administration. In the fishery industry, access and use of fish market information are becoming very important not only in fishing, aquaculture, and fishery products
processing, but also in marketing. For production, information reports on fishing conditions are one of the key factors affecting the exploitation of marine resources, the size of production, and the income of fishermen. Information on fish ponds and the status of aquaculture can help aquacultural producers to manage their production plans. For marketers, information on the consumer's behavior and preference in fishery products are needed to develop their marketing strategies. The Taiwan Fish Market Information System (TFMIS) is motivated and developed by these demands. The Institute of Fisheries Economics (IFE) at the National Taiwan Ocean University, Taiwan, plays a key role in developing TFMIS.

TFMIS is a computerized fish market information dissemination system which was designed to provide timely fish market information to fishery producers, the fishery industry, fishery organizations, government, academic institutes, and consumers (see Figure 1). Information can be accessed through a standard touch-tone telephone. In addition, TFMIS has a database system which stores up-to-date fish market information in Taiwan. It includes fishery production by year, type, and species, fishery values by year, type, and species, the import and export of fishery products by country, species, and production, and forecast prices and production for over 20 major fishery products in Taiwan. The price information in this system is collected daily from the wholesale fish markets, retail fish markets, and major supermarkets throughout the Taiwan area. In the long run, TFMIS's database will include several selected countries’ fish market information, such as Canada, Japan, Mainland China, Norway, and U.S. etc. Data base systems are of particular interest to domestic and foreign economic researchers. This unique data base will certainly help them to obtain data sources.

The objective of this paper is to describe current TFMIS's functions, data sources, data processing procedures, and price forecasts, respectively.

TFMIS'S FUNCTIONS AND STRUCTURE

A bulletin board system (BBS) is used to develop TFMIS. Domestic users use their personal computer, modem, and telephone line to access TFMIS. In the long-run, TFMIS will develop a Gopher system on the INTERNET. At that time, foreign users can access TFMIS through INTERNET. Three functions are provided in the TFMIS. There are information service, mail service, and file exchange service.

The TFMIS information service includes: 1) TFMIS'S system introduction, 2) data sources, 3) data processing procedures, 4) domestic fishery production, 5) domestic fishery suppliers of major fish markets, 6) domestic fishery consumption, 7) forecast domestic fishery production, 8) forecast domestic fishery supplies of major fish markets, 9) forecast domestic fishery consumption, 10) foreign fishery production, 11) foreign fishery consumption, 12) forecasting foreign fishery production, 14) forecast foreign fishery consumption, 14) domestic fishery news, 15) foreign fishery news, and 16) TFMIS bulletin board.
Figure 1. TFMIS's Structure
DATA SOURCES

There are several domestic and foreign data sources. The domestic data come from: 1) daily market information from the wholesale markets, retail markets, and major supermarkets throughout the Taiwan Area, 2) Fisheries Yearbook, Taiwan Area, Taiwan Fisheries Bureau, Department of Agricultural and Forestry, Provincial Government of Taiwan, 3) Agricultural Yearbook, Taiwan Area, Council of Agriculture, Republic of China, 4) Import-Export Monthly Reports, 5) The Survey of Family Income and Expenditure of Taiwan Area, and 6) The Survey of Family Income and Expenditure of Taipei Municipality. Regarding the daily market information in the Taiwan area, the fish market transaction data, e.g., price, quantity, species, and weather conditions, are transmitted through modem to the information center of the Data Communication Institute (DCI) before 10 AM on each transaction day. These data are downloaded to the TFMIS database from DCI 11 AM everyday. Currently, the TFMIS data base has the retail-level and farm-level fish market transaction data from September, 1993 to present and the wholesale-level fish market transaction data from February 1987 to present.


DATA PROCESSING PROCEDURES

TFMIS has a variety of data sources. Each source has its own format. Some are from government documents or publications. This kind of data has to be coded into the computer, for example, prices and production information from the Fisheries Yearbook, Taiwan Area, Taiwan Fisheries Bureau. Some are stored on diskettes, tapes, and CD-ROMs. A transformation is needed for this kind of data because each one has a different file format. The other problems are the language, the units, and the definitions among countries. It is beneficial to establish procedures to deal with data problems (see Figure 2).

The first step will be to sort and store all data sets in the computer according to a standard format. The second step is to do the preliminary statistic analysis. Basic statistic descriptions are obtained such as means, standard deviations, etc. SAS or SPSS program is used in the analyses. In the third step, Lotus 1-2-3 is used to make line and/or bar charts according to the characteristics of the data. The final step of the data processing procedures is forecasting. Several forecasting models such as ARIMA model, composite forecasting method, and econometric model (Bowerman et al. 1970; Nelson 1973; Harris & Leuthold 1985; Harvey 1981 & 1988; Bowerman & O'Connell 1993) are used in this step. The detailed model specifications are not described here but are available upon request. The results of the forecasting will be presented in both tables and graphs.
FORECASTING

Forecasts of fisheries products production, prices, and consumption play a very important role in fishery policy-making processes. Accurate and reliable forecasts are necessary especially to a country whose fishery industry is in trouble such as Taiwan, Republic of China. With good forecasts, one can better understand domestic and foreign markets and can make correct decisions and polices to reduce resource misallocation and to enhance fishery management.

There are many forecasting methods available. Each has advantages and disadvantages. One cannot judge it right or wrong merely in terms of theory. It is better to use existing data to do the forecasting using different methods and to find the best method for each data. Three forecasting methods are used in this system: an ARIMA model, a composite forecasting method, and an econometric model.

CONCLUDING REMARKS

This paper documents several aspects of TFMIS. The goals of TFMIS are: 1) to help producers to manage and adjust their production plans, 2) to help marketers to develop their marketing strategies, 3) to help academic researchers to obtain related data for the needs of their research, and 4) to help government to develop fishery policy. The contributions and implications of TFMIS for industry use and economic research will be substantial. However, it depends on the proper management of the system.
Figure 2. Data Sources and Processing Procedures
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