Value Chain Dynamics, The Small-Scale Sector and Food Security:
A Cross Country Comparison and Synthesis

Dr Trond Bjørndal
Professor, Aalesund University College
Senior Researcher, SNF Centre for Applied Research at NHH
Hellevn. 30
N-5045 Bergen, Norway

Anna Child
International Consultant, Products, Trade and Marketing Branch (FIPM)
The Food and Agriculture Organization (FAO) of the United Nations
Viale delle Terme di Caracalla
00153 Rome, Italy

Dr Audun Lem
Chief, Products, Trade and Marketing Branch (FIPM)
The Food and Agriculture Organization (FAO) of the United Nations
Viale delle Terme di Caracalla
00153 Rome, Italy

Dr M Madan Dey
Professor, Aquaculture and Fisheries Center
University of Arkansas at Pine Bluff
1200 North University Dr
Pine Bluff, AR 71601 USA

Jogeir Toppe
Fishery Industry Officer, Product, Trade and Marketing Branch (FIPM)
The Food and Agriculture Organization (FAO) of the United Nations
Viale delle Terme di Caracalla
00153 Rome, Italy

For correspondence and corrections of proofs:

Anna Child
414 Moonridge Rd
Chapel Hill, NC 27516 USA
001.410.279.7677
Anna.Child@fao.org
ABSTRACT

This study focused primarily on price transmission in fishery and aquaculture value chains in 14 developed and developing countries, with the general findings and policy recommendations in 7 of the countries summarised in this article. Although the study is focused on the small-scale sector, both the small-scale and large-scale sectors were analysed in order to demonstrate differences and similarities between the two. Across all value chains analysed, the main findings are that relative to other players in the value chain, small-scale fishers and fish farmers are receiving the smallest economic benefits for their products. Processors and retail markets were found to be receiving more of the distributional benefits of the value chain owing to their stronger bargaining power. The policy recommendations presented aim to safeguard the interests of small-scale fishers and fish farmers by enhancing their market power so as to improve their prices and margins while allowing the resource to achieve long-term sustainability from an economic, social and biological perspective.

INTRODUCTION

Fisheries and aquaculture play an important role in nutrition, food security and livelihoods. Direct consumption of fish provides protein and a range of other nutrients, particularly essential fats, minerals and vitamins. Increased attention is now being given to fish as a source of essential nutrients in our diets, as a unique source of micronutrients and long chain omega-3 fatty acids (Toppe, 2014). In addition to providing nutrition and food security direct, fisheries and aquaculture contribute indirectly through employment. It is estimated that around 56 million people are directly engaged in the fisheries sector, with employment in both fisheries and aquaculture growing faster than employment in traditional agriculture and faster than population growth (COFI, 2014; FAO, 2012).

In terms of fish consumption, world per capita consumption increased from an
average of 9.9 kg in the 1960s to 18.9 kg in 2010, with preliminary estimates for 2012 demonstrating further growth to 19.2 kg. The driving force behind this growth has been a combination of population growth, rising incomes, and urbanization, which is connected to the strong rise of fish production and modern distribution channels. Despite these increases, significant disparities in fish consumption exist between the more developed and the less developed countries. Though there are certainly regional differences, developed regions still demonstrate generally higher levels of consumption, although the gap is narrowing. In 2010, per capita apparent fish consumption in industrialized countries was 27.4 kg, while for all developed countries it was estimated at 23.3 kg (FAO, 2014).

While the importance of fisheries and aquaculture to nutrition, food security and employment is now acknowledged, in recent years there has been increased interest in the value chains of seafood products and in investigating the relationship between different levels in the value chains. While investigating the value chain linkages, causality of price changes is of special interest. Much of the earlier work in price linkages between different levels in the value chains are drawn from the agricultural economics literature (see, for example, Gardner, 1975; Heien, 1980; Ward, 1982; Brorsen et al., 1985; Kinnucan and Forker, 1985; Wohlgenant, 1985; Holloway, 1991; Lyon and Thompson, 1993; Goodwin and Harper, 2000). Recently a number of studies have examined price transmission for different fish species (see, for example, Guillotreau, 2004; Guillotreau et al., 2005; Jaffry, 2005; Jiménez-Toribio and García-del-Hoyo, 2006; Floros, 2006; Asche et al., 2007, 2014; Simioni et al, 2013 ). However, almost all of these studies are on developed countries focusing on commercial fish species. Research on price transmission across seafood value chains is fairly new in a developing country perspective.

The Food and Agricultural Organization of the United Nations (FAO) recently conducted a comprehensive analysis of small-scale and large-scale fishery and aquaculture
value chains in developed and developing countries to explore value chain dynamics, food security and policy recommendations (Bjorndal et al. 2014). A key component of the value chain dynamics study was to analyse the factors that determine prices and margins throughout the value-chain as well as the distribution of benefits among the various stakeholders. In addition, with the importance of fisheries and aquaculture to food security, policy recommendations were crafted towards understanding how countries might achieve improved food and nutrition security from their fishery and aquaculture resources.

The purpose of this article is to present summarised country-specific general findings of price transmission studies and policy recommendations that emerged as key themes across all the value chains analysed. Value chains in 14 countries were investigated (table 1). Both capture and farmed species were included; in some instances, a particular species was both wild caught and farmed.

Table 1. Summary of species and price data analysed by country

<table>
<thead>
<tr>
<th>Country</th>
<th>Capture species</th>
<th>Aquaculture species</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangladesh</td>
<td>Hilsa</td>
<td>Rohu, catla, pangas, tilapia</td>
</tr>
<tr>
<td>Cambodia</td>
<td>Indonesian snakehead, pangas catfish, boeseman croaker, kes, carp</td>
<td>Indonesian snakehead, pangas catfish</td>
</tr>
<tr>
<td>Canada</td>
<td>Dogfish, halibut, herring, sablefish, sole, salmon, lobster</td>
<td></td>
</tr>
<tr>
<td>Ghana</td>
<td>Tilapia, tuna</td>
<td>Tilapia</td>
</tr>
<tr>
<td>Honduras</td>
<td>Shrimp, lobster, snapper</td>
<td>Shrimp, tilapia</td>
</tr>
<tr>
<td>Country</td>
<td>Fish Products</td>
<td>Additional Products</td>
</tr>
<tr>
<td>-----------</td>
<td>-------------------------------------------------------------------------------</td>
<td>--------------------------------------</td>
</tr>
<tr>
<td>Iceland</td>
<td>Cod, haddock, redfish, Greenland halibut, herring</td>
<td>Greenland halibut</td>
</tr>
<tr>
<td>Japan</td>
<td>Japanese sardine, horse mackerel, Pacific saury, flying squid, red seabream, skipjack tuna</td>
<td></td>
</tr>
<tr>
<td>Kenya</td>
<td>Nile perch, silver cyprinid, Nile tilapia, lobster</td>
<td></td>
</tr>
<tr>
<td>Maldives</td>
<td>Tuna</td>
<td></td>
</tr>
<tr>
<td>Norway</td>
<td>Cod</td>
<td></td>
</tr>
<tr>
<td>Peru</td>
<td>Peruvian anchovy</td>
<td>Shrimp, scallops, trout,</td>
</tr>
<tr>
<td>Spain</td>
<td>Hake, sardines, anchovy, blue whiting, mackerel</td>
<td>Rainbow trout, salmon, mussels</td>
</tr>
<tr>
<td>Thailand</td>
<td>Tuna</td>
<td>Vannamei shrimp, tilapia, walking catfish, seabass</td>
</tr>
<tr>
<td>Uganda</td>
<td>Nile perch, mukene, bagrus, tilapia, African catfish</td>
<td>Tilapia, African catfish</td>
</tr>
</tbody>
</table>

As 14 countries were included in the overall project, with geographic locations spanning Asia, Africa, Europe, Latin America and North America, each value chain differed significantly. While some value chains were solely export driven, others were only for domestic consumption and still others targeted both. Moreover, production methods were on
a wide spectrum of scales and employed a range of gear types, from traditional canoes to modern industrial trawlers. Similarly, for aquaculture, production systems ranging from very small-scale to commercial large-scale operations were included. Although there was some overlap in terms of species analysed, most species were unique to their country. Lastly, each country had its own data limitations, which led the depth of findings to vary.

This paper is organised as follows: In section one, we will present results from some of the country studies. The emphasis will be on what can be done to improve income for small-scale fishermen and fish farmers. Based on the overall research, a number of policy recommendations can be derived. These are presented in section two. The final section will discuss further implications of the research.

1. COUNTRY RESULTS

As noted above, value chains in 14 countries were analysed in the full report on this project, published as FAO Technical Paper 581\(^1\). For the purposes of this article, the results for seven countries will summarised here, including Ghana, Kenya, Cambodia, Japan, Iceland, Canada, and Norway.

For Ghana, tuna and tilapia were considered. Tuna is of major commercial importance owing to its export revenues whereas tilapia has large domestic demand for both fresh and locally processed varieties. In Ghana, large- and small-scale value chains coexist; they are not mutually exclusive and contribute to each other’s efforts. For example, small-scale fishers obtain many inputs such as nets, outboard motors and fuel from the large-scale agents, thus contributing to the industry’s income. Moreover, small-scale traders and processors obtain tuna and tilapia from firms with large-scale commercial fleets. In comparing the value chains for tuna, the large-scale chain has significantly more organisational and institutional support

---

\(^1\) Paper can be viewed here: http://www.fao.org/docrep/019/i3630e/i3630e.pdf
and, as such, has a better understanding of how to access international markets. The small-scale value chain for tuna has no access to information from international markets and only limited access to that from larger domestic markets.

Support and training for the small-scale sector in Ghana should target the following areas: international market requirements and certification, pricing methods, safe and hygienic practices, reduced post-harvest losses, and infrastructure such as appropriate storage facilities near fish landing sites and refrigeration at local market sites. Moreover, it is recommended that small-scale buyers and sellers adopt pricing methods according to weight, as is done with meat in the country.

For Kenya, the four capture species selected show a general trend of declining catches, which is probably the reason for their price increases since 2007. Furthermore, the margin analysis conducted between first-hand and export earnings found significant disparities. On average, exporters earn 250 percent of the first-hand earnings for Nile perch. The lobster fishery provides the highest price to fishers, but exporters still earn 140 percent of the first-hand earnings. These are very considerable mark-ups and the study found that disparities were largely due to fishers’ weak bargaining power and challenges in accessing markets. As such, it is recommended that fishers become organised in producer groups, which could strengthen their bargaining power.

There is a need to harmonise the current institutional framework for fisheries in Kenya and to advocate for a distinct fisheries policy in order to support the small-scale sector more effectively. A working group from various ministries should be formed, specifically with the mandate to address challenges facing the small-scale fisheries sector and to establish a framework for how they will work together. To enhance earnings, it was recommended that new value-added product development be supported, with standards set for these new product
forms. Moreover, domestic and regional markets should be researched and further developed to provide fishers and fish traders with a non-export market.

The Cambodia study covered five capture species, however, two of these are also farmed. The annual quantity traded of these five species has declined dramatically in the past six years, mainly as a result of the decrease in wild fish stocks in rivers and lakes due to increased fishing pressure as a consequence of population growth and the limited aquaculture development in the country. As a consequence, the prices of all the species studied have increased sharply in the last six years.

Generally, as expected, retail prices are higher than wholesale prices, and wholesale prices are higher than first-hand and farmgate prices. However, the margins differ among species and stages of the chains. Wholesalers of snakehead and croaker may have less market power than retailers, while wholesalers of carp may have more power than retailers. Positive asymmetry was found in pangasius and croaker. This means that whenever there was an increase in price at the wholesale level for pangasius and croaker, the retail price increased faster compared with the rate of the decrease in retail price when the wholesale price dropped. This was not the case with carp, as no asymmetry was found.

To increase production in Cambodia, appropriate technologies for farming snakehead and pangasius must be adopted. Pellet feed for fish feed should be used instead of low-value fish, which should be promoted for direct home consumption (DHC) to improve food and nutrition security. More so, ingredients for the fish feed must come from sustainable sources. Quality management should be improved by introducing proper conservation technologies when transporting fresh fish. In addition, training for appropriate processing techniques to develop and sustain key freshwater fish products should be provided.

Information on fish prices should be made broadly accessible to all agents in the
Cambodian value chain, as price transparency is vital to help agents obtain more equitable benefits and reduce price fluctuations. Prices could be made more accessible by developing a market information network among stakeholders using mobile or radio commerce. Wild fish stocks must be managed effectively by reducing and eradicating all illegal, unreported and unregulated (IUU) fishing or any activity that harms resources in an unsustainable manner. This is absolutely necessary so as to control fishing effort and harvest.

Seven capture species were analysed for Canada. All show a negative trend in first-hand price except salmon. This negative trend continues through to the revenue for all species except lobster. Unless the cost of effort declines, real profits will continue to fall. Although dogfish, halibut, sablefish and sole are currently managed by Individual Transferable Quotas (ITQs), it is recommended to consider moving herring to ITQs as well, though it is vital to be cautious within this process as all stakeholders, including fishers, government, NGOs and others must be brought into the process to ensure buy-in and long-term sustainability of the management plan. Herring ITQs could result in improved productivity over time, which may ultimately be reflected in the returns to labour, though it is important to note that the number of fishers may decline.

Other opportunities for strengthening fishers’ livelihoods and developing new and alternative approaches in terms of sales, marketing and organisation should be explored in Canada. Possibilities include direct sales, in which fishers sell directly to the consumer (thus capturing the most value for their catch); marketing strategies such as labelling to promote quality, origin and freshness; and cooperatives, which can promote sharing of costs and resources, help ensure environmental conservation and enable an exchange of best practices.

For Iceland, five capture species were considered with one farmed in small quantities. The large-scale consolidation of the fisheries companies in the last 8–10 years is probably the
most important effect of the changes in the macroenvironment of the fisheries sector in the country. The implementation of the ITQ system has contributed to and facilitated this consolidation. Of the 20 publicly listed fisheries companies in 1999, only nine have survived, with the rest merging with other companies. Concentration in holdings of ITQs has increased over time. In 2007, the 50 largest quota owners had 82 percent of the total quota in all species compared with 60 percent in 1995. Currently, the industry is characterised by a high degree of vertically integrated companies in terms of both fishing and processing. Generally, these are small and medium-sized companies. There are also a few traditional fishing companies with operations in countries outside Iceland.

There has always been a significant difference between the fish market (auction) prices and the prices of fish in direct sales (internal sales) in Iceland. The first-sale price is very sensitive to fuel prices, and most changes in prices from 1993 to 2010 can be linked to fuel prices. Except for herring, a general price trend was traceable for all species in which the price increased gradually until 2006 and then declined sharply from 2008–09. The auction price generally tends to be higher than a contractual price or the internal price used by Bureau of Ex-Vessel Fish Prices owing to the fact that the number of buyers is much greater in an auction, which tilts the prices in favour of the sellers.

Other lessons learned from the value chains in Iceland include the benefits of direct contact for value creation and efficiency. Direct communication between value chain agents supports better marketing knowledge by the producers and increased understanding of the needs and aims of the producers by the marketing sector. Efficiency in the chain is gained through direct ties between producers, foreign wholesalers and secondary processors or retailers with bilateral or trilateral connections and by simplifying or cutting out expendable links in the value chain. Key success factors for Iceland’s exports include: reliability in quality and delivery, stability and efficiency, high-tech processing with high material yield,
and products targeted to the right markets that meet buyers’ needs.

The Japanese study included six capture species of which one is also farmed. In and before 1994, market power between buyers and sellers in the country depended on the species. After 1994, this dynamic shifted and the market power of buyers increased for all species except saury. This shift can be explained by three main factors: the perishable nature of fishery products, the existence of substitute goods, and the imperfect competition in the market caused by the increasing dominance of powerful supermarkets over traditional fishmongers. If similar market conditions continue, fishers will be forced to accept their weaker position for these species when compared with their downstream counterparts.

To reconcile this situation, it is recommended that the fish distribution channel be simplified, along with efficient collection and transportation methods. E-commerce was suggested as one possible strategy to aid in this process. To address the perishability of products, frozen fish should be promoted more widely. Although defrosted products are more preferable and familiar to consumers, a marketing campaign to promote the freshness of frozen products, as well as the convenience of defrosting fish at home, could help mitigate the concerns.

Reasons for why market power for saury in Japan rests with sellers (supermarkets) were investigated. According to managers and employees of supermarkets and wholesale markets, owing to the significant amount of promotional marketing activities for saury, it is thought of as an attraction item for consumers to supermarkets, and is an easy product to sell. In addition, it is normally purchased as whole product and is convenient for customers to prepare.

For Norway, only cod was considered. While the first-hand price for cod has remained relatively stable since 1994, the export price has fluctuated to a greater extent.
However, there is a fairly close relationship between them. The export price has experienced a relatively larger increase compared with the first-hand price, and as such the gap between the two prices has grown larger. Nevertheless, the relationship between the first-hand price and export price of cod demonstrates a positive correlation. Analysis of the relationship between the export price and export volume found a weak relationship.

2. POLICY RECOMMENDATIONS

Although the section above and other articles in this issue provide findings and policy implications that are country-specific, many of the conclusions were found to be common across nations. Thus, in this section, overall recurring themes and policy recommendations that emerged as similar and even consistent across countries are presented and discussed.

Despite innate differences in the value chains themselves and the distinct data sets available for the countries, recurring themes related to distributional benefits in the small-scale value chain emerged. First and foremost, the case studies found that, relative to other players in the value chain, small-scale fishers and fish farmers are receiving the least economic benefits in terms of amount of money earned for their products. Processors and retail markets were found to be receiving more of the distributional benefits of the value chain owing to their stronger bargaining power. In some cases, the disparities in terms of earnings were considerable. Following this overall finding, policy recommendations focused on how to provide more support for the small-scale sector and how to help the agents obtain more value for their product. Several policy recommendations were consistent or similar across a number of countries, and these are presented below.

Policy recommendation 1: Inclusion of the small-scale sector in national strategic and policy related planning must be worked towards. This will allow for increased governmental, NGO and private-sector support for the small-scale fisheries and aquaculture sector to achieve
more equitable distribution of benefits.

Although general, this recommendation is a requirement for all other policy recommendations to be feasible. Support for the small-scale sector should be targeted in four main areas: technical training, infrastructure needs, finance, and research and development. In terms of training and infrastructure, some examples of needs can be seen in Ghana and Thailand. In Ghana, it was recommended that national and local government as well as NGOs provide support for educational training on international market requirements and certification, hygienic practices and reduced post-harvest losses. Appropriate storage facilities were also noted as being needed. In Thailand, this need for better storage facilities was highlighted as well, particularly for rural markets. With the current lack of storage, fish farmers in rural Thailand often have to sell their products in an unfavourable market.

In terms of financing, the case study in Peru found the need to increase financial support for small-scale fish farmers to help deal with cash-flow constraints and support the development of a comprehensive cold-chain distribution system as well as a marketing agenda. Research and development for new value-added and/or created products was also an important need, especially in countries where growing economies are opening up new opportunities for seafood products. For example, in Honduras, the analysis found that producing more value-added products with high-quality standards would be key to keep the sector growing and creating new livelihoods. In Cambodia, the analysis found that all chain agents usually incur some type of fee during business transactions, which reduces profit margins and restricts access for the most vulnerable.

Policy recommendation 2: Organisational models and agreements should be introduced and supported to help the small-scale sector increase its price negotiation power and share resources.
In order to achieve this, support from governments, protection by legislation and incentivizing (or even mandating) participation in organisational models such as selling desks, private/public partnerships and cooperatives should be considered. This recommendation should be led by national governments and international agencies. Examples of successful organisation models could be borrowed from other countries in terms of how sales organisations have developed and functioned in different market situations. The case studies presented a range of models that could be used for the sector to become more organised, including: cooperatives, single seller desks, and cooperation between agents in the value chain. The type of model to be adopted was seen as dependent on what would be most beneficial and adaptable to the local context.

For example, in Maldives, the existing structure of the tuna fishery is such that many small-scale fishers are selling to only two processors, which gives buying power to the latter and allows them to increase their share of profits at the expense of the fishers. It was recommended that the small-scale fishers create a single seller operation where all fish harvested is marketed through a single desk, with prices set in a manner to benefit both parties. Similarly, in Uganda’s small-scale Nile perch sector, the small number of processing firms makes it possible for a single selling desk to represent the interests of the fishers. Even when fish prices were expected to increase owing to growing market demand, case studies predicted that fishers/farmers would still receive the least benefits, due in part to this disorganisation. One example of this was in the capture value chain in Bangladesh, where the analysis projected that the retail price of a local fish (hilsa) was expected to increase by about 5–6 percent annually. However, instead of fishers realizing this price gain, retailers were the ones most likely to benefit. Again, it was recommended that hilsa fishers become organized in order to more equally receive their fair share of expected price increase. Small-scale fish farmers in Bangladesh were found to receive a higher price for their fish than their fisher
counterparts, probably due in part to their better organisation.

In Kenya, where a notable disparity was found for income received from Nile perch when comparing first-hand with export prices, it was recommended that fish action centres be developed, which could provide organisational training for fishers to help them increase their bargaining power as well as provide necessary infrastructure for them, so they are not reliant on a third party. The Kenya case study also had a unique recommendation regarding organisation; that is, all agents in the value chain should be engaged in order to address the concept of benefit sharing, which is central to the concept of value chains themselves. What form this engagement could take may be as an inclusive business model or other form, but the concept of bringing all agents together may be an important prerequisite to obtaining fairer pricing for fishers and fish farmers.

One example of this type of engagement that could possibly be replicated is in Peru, where success has been documented in engaging small-scale and industrial agents in the shrimp, scallop and trout farming sectors. A few large trout companies have provided technical assistance and credit to small producers, with the small companies then selling their harvest to the large companies for a higher price than they would have been able to obtain otherwise. Agreements observed between them have not been based on formal contracts, but rather on long-term relationships between a buyer (integrated trout producer) and seller (small-scale trout farmer). As demonstrated in this case of Peru, becoming more organised could also help fishers and fish farmers to access new markets. In addition, cooperatives and single seller desks could help the sector participants aggregate their catch regularly, allowing them to sell to supermarket chains and institutional markets with a consistent supply of product.

*Policy recommendation 3: Fishers, fish farmers and small-scale traders should be assisted in*
adopting more consistent pricing methods and documenting expenses and net profit. In addition, prices need to be made more transparent and accessible to all chain agents. This recommendation could be driven by national governments and institutions such as agricultural extension, as well as NGOs, international organisations and development agencies.

In many of the developing country case studies, it was found that fish price is dependent on a wide range of variables beyond the control of fishers, such as bargaining power and market conditions. This is especially problematic as the most vulnerable populations have the least control over these variables and are left feeling disempowered by their livelihoods.

Adopting standard pricing methods locally or even regionally could be one step to help producers know how to set a fair price for their products, help establish more consistency in profits over time and achieve more equal negotiating power between sellers and buyers. Pricing methods could be by weight, bags, hands, or whatever measurement is most accessible to local stakeholders. Training in consistent pricing methods and supplies such as weight-scales could help provide an initial first step. Although market variables beyond the control of fishers or fish farmers will continue to be present, training to promote documentation of expenses and net profit could help fishers and fish farmers become aware of seasonal patterns and market trends over time. Moreover, where possible, more transparent pricing could lead to a better functioning market with reduced price fluctuations, as this information can be used as leverage for agents in their price negotiations. One example of a method for disseminating information on prices is through the radio, as has been successfully documented in Mozambique, where the local radio station broadcast fish prices every Friday.

Policy recommendation 4: Provide a policy and financial environment conducive to
establishing new small-scale fish farms and adopting appropriate and sustainable farming methods. Case studies found that this will be crucial to the small-scale aquaculture sector’s long-term sustainability and further development. This environment should be provided by national governments and international governmental bodies such as FAO as well as NGOs.

For example, in Cambodia, it was recommended that appropriate aquaculture technologies for raising snakehead and pangasius be adopted. It was also found that fish farmers need to move towards using sustainably sourced pellet feed for fish food instead of low-value fish. Adopting these practices would reduce fish mortality rates, improve the quality of fish and avoid the depletion of low-value fish, which are highly nutritious and could be promoted for DHC use instead.

In addition, the case study pointed out that more opportunities to establish start-up farms are needed. Indeed, it is vital that aquaculture not only supports a highly consolidated industry, but also maintains room for small-scale, diversified fish farms. This recommendation could be partially enabled by providing low-interest loans, access to credit and/or microgrants to foster investment and start-up farms while encouraging sustainable farming methods by providing funds to help supplement the cost. However, careful planning is needed when deciding to establish new fish farms. Land and water availability must be ensured, and thorough consideration must be given to analysing how the proposed increased competition will affect existing aquaculture farms.

Policy recommendation 5: There is a need for an increased focus on the promotion and marketing of fish and fishery products, especially in countries that currently have low domestic consumption rates. Promotion of domestic markets should be based on estimates for domestic demand of fish and fish products. Again, national governments could play an important role here as well as local universities, NGOs and FAO. This recommendation
stems from a major case study finding indicating that marketing is crucial not only to
developing a domestic market for small-scale producers but also to helping countries achieve
improved food security and nutrition.

For many developing countries, marketing is something that has not been developed at all and has been difficult given the lack of perceived buying power in the domestic market as well as the lack of infrastructure, such as cold-chain distribution, storage, etc. However, the perception of a lack of buying power may be false; in Honduras, the case study found the local market to have significant potential, and as such recommended that fish be domestically promoted. The study found that the lack of marketing might be one of the major reasons why the domestic market has been unable to expand and explains why most snapper fish is exported. This recommendation must be coherent with policy recommendation 1, especially regarding securing proper infrastructure and training to supply local or domestic markets with fish of good quality.

Policy recommendation 6: New markets for the small-scale sector should be researched and developed. In particular, domestic markets in developing countries need to be explored. Factors influencing exports and the cost of the domestic market need to be researched and taken into account. In some countries, it can be easier to export to a foreign country than to market fish products within national boundaries, especially where infrastructure and distribution systems are poor or absent. However, the case studies did find that domestic markets had strong potential.

Although the analysis demonstrated that international market prices for export products are usually higher than domestic prices for local consumption, in some cases the domestic market price was equal to or even higher than the international market price. This finding is due to the often significant expense of transportation and transaction costs when exporting to international markets, making domestic markets at times more profitable. For
example, in Honduras, wholesale prices for shrimp were 20 percent higher than export prices to the European Union from January 2007 to December 2008. This was also found with tilapia fillets, as the domestic market gave a price that was 11 percent higher than the United States import price.

The finding was probably due to the fact that domestic buyers in the country are dominated by restaurants and hotels, which are willing to pay prices similar to the international market prices. The analysis concluded that this finding should be interpreted with caution as the small size of the domestic market limits the potential for increased sales in the short term, so that producers need to find the most profitable balance in terms of supplies to the domestic and the export markets. However, it is a vital finding for the future, as growth in fish consumption is expected to be driven largely by domestic markets in developing countries.

In the analysis on Peru, findings demonstrated that although domestic prices are generally less than export prices, they vary widely within the country. The analysis reported that export prices for anchovies, scallops, shrimp and trout were sometimes 50 percent higher for export prices than domestic wholesale price; however, this difference was found for rural, domestic markets close to aquaculture production centres or fishing ports. Further research found that domestic markets in large cities could actually pay significantly higher prices than the rural markets, prices that are much closer to the export price. Nonetheless, much of the production is currently sold in these rural areas as fishers and fish farmers face distributional barriers and thus cannot reap the greatest profit for their catch. Therefore, developing and improving distribution channels is vital in supporting the development of a domestic market. However, lower prices in the rural market may secure fish at affordable prices for the rural population. The creation of a more functional market, without securing growth in wealth for the rural population or a fair distribution of profits in the value chain, could lead to a
worsened food security situation in rural communities. Hence, food security should be monitored in these rural areas when efforts to develop markets are planned and carried out.

In Kenya, the development of a non-export value chain was also encouraged as a way to enhance income for small-scale fishers and traders. It was noted that the potential for a domestic and regional fish market is largely unexploited and could also offer an opportunity for new product development. Overall, the potential for producers to better penetrate domestic markets also highlights the need to market and promote local fish consumption.

Policy recommendation 7: Improved national and international management regimes should be developed and implemented to protect marine, river and lake ecosystems. Management should be aimed at achieving optimal sustainable yields from fish stocks and identifying areas suitable for sustainable aquaculture. Good practices for fisheries co-management should be developed in order to sustain the small-scale value chain in the long term.

Securing sustainable fisheries and aquaculture production at an optimal level is necessary to secure long-term supply in the value chain and ultimately food security. Examples of well-functioning national management plans, regulatory frameworks for aquaculture and international cooperation for managing shared stocks should aid developing countries in the development of suitable models, which could be adapted to the local context. Compared with utilizing a top-down management approach, co-management is suggested as including fishers has been an indicator of success in numerous countries.

In Cambodia, it was recommended that wild fish stocks and other aquatic resources be managed effectively by prohibiting and putting high pressure on all IUU fishing or any activity that harms natural resources in an unsustainable manner. In Uganda, the analysis clearly pointed to the importance of shared fishery resources in Lake Victoria being managed cooperatively with Kenya and Tanzania. Management recommendations also included
subsidy reduction and exploring the potential for complementary livelihood activities. In Maldives, the analysis found that subsidies for fuel should be reduced or avoided as they are currently distorting the economic incentives facing fishers and result in increased fishing effort above the efficient level of harvesting. Instead, the analysis suggested that it may be prudent to investigate possible complementary livelihood activities in order to take pressure off the fishery and sustain its resources for the long term. This was also suggested in Honduras by promoting fisheries tourism, which could provide diversified income streams and help fisheries where growth is constrained by overfishing. Similar considerations apply to aquaculture in terms of ensuring a sustainable development of the industry, and it is important to include fish farmers as stakeholders in this development.

*Policy recommendation 8: Local food security should be a major consideration in developing markets for fish and fish products as well as management plans and regulatory frameworks for fish stocks and aquaculture. Initiatives taken to develop markets might deprive local consumers from affordable food in the short run. Sustainable management schemes often require regulatory measures to rebuild fish stocks that could negatively affect fishers’ income in the short run. However, this may be compensated by higher catches in the future. Under these circumstances, rural communities dependent on subsistence fisheries should be protected, in the short run as well as the long run.*

In the long term, both the development of value chains and rebuilding of fish stocks should benefit the local population, both in terms of livelihoods and food security. However, in the short term, management measures or bringing fish to national and/or international markets might reduce the local food supply. It is probable that parts of the population will not have sufficient buying power to purchase alternative food at world market prices or prices obtained in the more affluent part of the domestic market. Therefore, securing sufficient nutrition for the most vulnerable parts of the population must be considered in order to ensure
local support and legitimacy for initiatives regarding market development and management plans.

Similarities and differences between the small-scale sector in developing countries and the large-scale sector in developed countries were found when comparing case studies. Even given the innate differences between countries and value chains, there were many similarities. Both types of markets are composed of a mix of local and imported fish and fishery products and are made up of a complex array of agents, enterprises and institutions, although they vary in scale and scope. Retail chains or supermarkets play an important role in fish and seafood retailing in developed countries while direct fishers’ markets or individual fishmongers are vital for markets in developing countries. Institutional markets (hospitals, the armed forces, schools, etc.) and the hospitality sector play an important role in most countries, both developed and developing. Finally, it is vital that fisheries in both developed and developing countries are based on sound resource management.

Many differences were also found, particularly the fact that developing countries lack many of the institutions found in developed countries, such as a relatively well-functioning market, regulations, hygiene, standardized and enforceable contracts, market information, and a well-functioning banking system. Developing countries have significantly less of a focus on processing and marketing, explaining in part the fact that they are mostly exporting raw products (commodities). The domestic market is also often less developed, particularly because restaurant and institutional markets are less developed owing to lower disposable income. Moreover, certification and quality assurance requirements for the domestic markets have been poorly applied in many developing countries.

3. CONCLUSIONS AND IMPLICATION FOR FURTHER RESEARCH

The policy recommendations presented in this article generally relate to increased
governmental, NGO and private-sector support, improved organisation, consistent pricing methods and making pricing more transparent, the sustainable expansion of small-scale fish farming, an increased focus on promotion and marketing, and the exploration of new markets. These policy lessons demonstrate excellent entry points for national governments and organisations such as FAO, the International Fund for Agricultural Development and the World Bank to provide policy support, technical trainings and/or infrastructure. The article cautions that sustainable resource management and better regulatory framework practices are a necessary condition for small-scale value chains to be sustained. It also highlights the crucial need to always consider and safeguard the impact that increasing trade will have on local food security.

It is, however, appropriate to point out that limited data availability imposed severe restrictions on what kind of price analyses could be undertaken. FAO, in collaboration with its members, may wish to consider whether, in the future, systematic price data should be collected for a representation of value chains.

The findings highlight a range of areas where further research and analysis are needed. These areas include: the role of trade in local food security and sovereignty; the viability of domestic markets; possibilities for innovative value chains; the costs and benefits of certification schemes and other marketing tools; organisational models for value chains with an emphasis on the first-hand market; institutional models to support and monitor sustainable fisheries and aquaculture production; and methods of good governance in national and international management of fish stocks and areas for aquaculture, including methods and models for co-management.

A final recommendation for future research includes a strategic comparison of value chains in developed and developing countries. This should also be supplemented with
analyses of good practices for transfer of knowledge both to national institutions as well as local organisations and communities
ACKNOWLEDGMENTS

The main sponsors of the project were the Norwegian Agency for Development Cooperation (Norad) and FAO. Norad provided most of the funding for the project, and FAO provided the professional expertise of its staff and consultants, which facilitated its organization and completion. Both organizations maintained sustained participation in the study, coordinated its numerous reviews and provided inputs to its draft and finalization.

The FAO Project Focal Point, Dr Audun Lem and members of the international steering committee (among the leading professionals in fisheries and aquaculture around the world) provide guidance and support in launching the project. They followed its progress and provided helpful inputs throughout.

The team of national consultants undertook the case studies within a limited time frame and budget. The core of the FAO Technical Paper on the full study is based on the information provided by their significant and dedicated work.

Finally, many thanks go to all the agents in the fisheries and aquaculture value chains, including the fishers and fish farmers, processors, retailers, wholesalers, exporters and importers, for taking time out of their demanding work to allow the national consultants to collect many of the data needed to generate this analysis and final document.

Dr Trond Bjørndal
Lead Author
REFERENCES


