KNOWLEDGE IS POWER? REDRAWING THE ASYMMETRIES OF DATA DEFICIENCIES IN GLOBAL VALUE CHAINS LINKING BANGLADESH, THAILAND AND EUROPE

Kelling, Ingrid¹ and Young, James A².

¹Trade and Agriculture Directorate, OECD, ingrid.kelling@oecd.org
²University of Stirling, j.a.young@stir.ac.uk

ABSTRACT

The generation of market information is critical in dynamic and highly differentiated global seafood markets. Information has strategic value and market information is vital in creating and delivering product value. However, the context of long globalised supply chains and highly differentiated seafood markets results in value chain members having asymmetric access to, and understanding of, the same information. This reflexive paper, developed from the EU Sustaining Ethical Aquatic Trade (SEAT) project, examines the generation of market information in aquaculture value chains from Bangladesh and Thailand to the EU.

The paper first highlights the complexities of understanding seafood supply chains in the EU due to data aggregation, gaps, confusion and variable levels of detail. Next, the two main means of market information generation are examined: governance and consumer demand, in particular, the detail of emergent product attributes sought by changing preferences. Asymmetrical market power is self-perpetuating and built on data deficiencies driven by variations in accessibility and affordability. The paper also considers how such challenges might be addressed, not least through the opportunities afforded via information and communications technical progress, including visual and other sensory databases. The paper concludes that policy changes are readily available that could significantly address some of the existing inequities currently embedded within global seafood value chains to the advantage of both producers and consumers, if not all intermediaries.

KEY WORDS: Market information, market power, asymmetry, global value chains

ACKNOWLEDGEMENTS

The research was carried out as part of the Sustaining Ethical Aquatic Trade (SEAT) project, an inter-disciplinary research project with a focus on the sustainability of trade in four aquatic products from Asia to Europe, funded by the European Commission under the Seventh Framework Programme. The authors also gratefully acknowledge the assistance of the project teams in Bangladesh and Thailand.

INTRODUCTION: CREATING VALUE IN SEAFOOD SUPPLY CHAINS

“Every business today competes in two worlds: a physical world of resources and a virtual world of information” (1). In value chains, how the physical and virtual world are organised can lead to the maximising of competitive advantages. But for whom? In this paper, we use seafood as a case study to examine the link between access to market information for developing country aquaculture producers, and value creation.
International seafood trade takes place through value chains that link production in developing countries to developed country markets. Extensive market requirements, such as food safety criteria and product quality aspects related to environmental and socio-economic sustainability, are in place for internationally traded fish. The Asia-Pacific region dominates aquaculture production and the EU is the world’s largest single market for imported fish and fishery products. Studying tropical chains therefore provides an understanding of developed-developing country power relationships in value chains.

The assumption that global value chain (GVC) analysis makes - and one of its strengths - is that analysis can take place along the entire length of the value chain. Despite this, a result of the emergence of the GVC analytical framework from the political economy of development (and underdevelopment) approach is that GVC analysis has traditionally maintained a production orientation to study the workings and impacts of value chains (4). However, knowing consumer demands, transferring them to production and producing the desired product are critical in the global marketplace (5). These elements of generating market information, disseminating and responding to it are the crux of the market orientation approach. To be successful, a firm must orient itself around understanding customer needs. This leads to important assumptions about how information is accessed, used, passed along and responded to by value chain agents. While all value chain relationships do imply some transmission of information between the parties, the extent to which knowledge is created, transferred and adopted along the chain varies (9). Access to market information at all levels of the value chain has an impact on the chain’s ability to produce products that match consumer values.

METHODOLOGY

Primary fieldwork was carried out over 3 months in Bangladesh from September 2010 and 3 months in Thailand from February 2011. The two countries represent value chains with differing levels of consolidation, operational, and institutional sophistication, exemplified by widespread involvement of the rural poor in the aquaculture sector in Bangladesh, while in Thailand growth in seafood production has been exponential, resulting in the country become a leading seafood supplier with a highly developed and rigorous private sector and institutional context. 84 interviews were carried out in Bangladesh and 75 in Thailand. The selection of key informants was based on their specific roles in the value chain and relied on snowball sampling. Semi-structured interviews were used and a range of firm sizes was included to capture variations in operational practices.

Shrimp (black tiger) and prawn chains were selected for study in Bangladesh and shrimp (vannamei) and tilapia chains were selected for study in Thailand, as these species have export-driven value chains. Between September and December 2011, fieldwork was also undertaken in the EU: in Germany, the United Kingdom and France, given their relative importance in terms of consumption of the target species from the four Asian countries, as well as Belgium and the Netherlands as import hubs.

UNDERSTANDING THE EU SEAFOOD MARKET, OR NOT.
The basic assumption on which the market orientation approach rests is that information has strategic value. The better information that a firm has about a particular consumer, the more that firm will potentially be able to provide the consumer with a product that satisfies his or her demands (Pereira 2001).

The generation of market information is particularly important in a rapidly changing and highly differentiated market such as seafood; the greater the differences in end-user demands, the higher the levels of accurate information required. The more precisely that demand is satisfied, the more value a firm can extract through higher prices (contingent on whether the consumer is willing and able to pay). Information generation is therefore critical to extracting value, thereby potentially enabling the maximising of profits.

The European seafood market is not a single homogenous market and is arguably likely to become less so with the divergent performance of national economies and prospective new members, notwithstanding the exit of the UK. The EU market is host to an extensive global product portfolio due to diversity in geographic markets, market segments and a variety of standards such as food safety, product quality and sustainability. These, in addition to the relative importance of seafood to differing national markets as well as market segments and product categories means, that it is critically important to identify end-users and their wants.

Seafood consumption per capita does not necessarily reflect the most important markets for the species under consideration. Instead, international trade statistics can identify important EU importing countries for specific products. International trade in goods is recorded using standardised six-digit codes under the World Customs Organisation’s internationally agreed “Harmonised System” (HS) for commodity groups. In the EU, statistics on exports and imports are available through the EC’s statistics database (EUROSTAT). Eurostat uses the CN (Combined Nomenclature) system to identify products. The CN system is itself based on the HS system, but permits 8-digit rather than only 6-digit codes. The first six digits are identical to the HS system, but as the EU requires greater detail for statistical or tariff reasons, HS codes may undergo a further ‘split’ into 8-digit CN codes. Beyond six digits, countries are free to use their own definitions according to their individual requirements as presented in Table 1 below.

<table>
<thead>
<tr>
<th>Table 1. HS Codes for Shrimp and Prawn</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section</td>
</tr>
<tr>
<td>---------</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>1</td>
</tr>
</tbody>
</table>

1 A third system is in use, called the Standard International Trade Classification (SITC), established by the United Nations. Until the HS was adopted, the SITC was the only trade classification that enabled comparisons to be made on a worldwide basis. The third revision of the SITC, introduced on 1 January 1988 is the one currently in use, and provides headings that correspond directly to those of the HS declarations. Consequently, the SITC system is not discussed further.

2 www.wcoomd.org
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th>invertebrates</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>03</td>
<td>06</td>
<td>Crustaceans, whether in shell or not, live, fresh, chilled, frozen, dried, salted or in brine; crustaceans, in shell, cooked by steaming or by boiling in water, whether or not chilled, frozen, dried, salted or in brine; flours, meals and pellets of crustaceans, fit for human consumption</td>
</tr>
<tr>
<td>I</td>
<td>03</td>
<td>06</td>
<td>Frozen (all)*</td>
</tr>
<tr>
<td>I</td>
<td>03</td>
<td>06</td>
<td>11</td>
</tr>
<tr>
<td>I</td>
<td>03</td>
<td>06</td>
<td>13</td>
</tr>
<tr>
<td>IV</td>
<td>16</td>
<td>05</td>
<td>20</td>
</tr>
<tr>
<td>IV</td>
<td>16</td>
<td>05</td>
<td>20</td>
</tr>
</tbody>
</table>

* The use of the term ‘all’ is added by the author to clearly show where HS codes cover all types of shrimps and prawns and not just those of the genus ‘Panaeus’

*The terms shaded in grey denote levels of disaggregation that cannot be compared internationally.

Source: [http://online.businesslink.gov.uk](http://online.businesslink.gov.uk)

Member States of the EU do not always use the same codes to define products beyond six digits and therefore six digits is the most detailed product level that can be consistently compared internationally. The HS is updated (by addition or removal of codes, aggregation or disaggregation of products) every 5-6 years. The most recent revision took effect from 1 January 2012. One consequence of this varied categorisation process is to lessen the transparency of market information.

For example, species of the genus ‘*Panaeus*’ are only given a specific product code in international trade denoting their genus when frozen. All types of ‘prepared and preserved’ product forms are only disaggregated to the level of ‘shrimps and prawns’. In contrast, shrimps and prawns of the species ‘*Pandalus borealis*’ (cold water species) are given disaggregated product codes by the method of preparation or preservation e.g. shelled, boiled, frozen, cooked and peeled etc. This reflects traditional species important to the EU. The lack of standardisation of product codes and their dynamism can lead to serious problems when attempting to make temporal comparisons. In addition, the differentiation between freshwater prawn and marine shrimp is often not clearly made and the terms prawn and shrimp are used interchangeably.

[3http://tariff.businesslink.gov.uk/tariff-bl/export/heading.html?export=false&from=list&id=0306&simulationDate=15/08/12](http://tariff.businesslink.gov.uk/tariff-bl/export/heading.html?export=false&from=list&id=0306&simulationDate=15/08/12); [http://tariff.businesslink.gov.uk/tariff-bl/export/heading.html?export=false&from=list&id=1605&simulationDate=15/08/12](http://tariff.businesslink.gov.uk/tariff-bl/export/heading.html?export=false&from=list&id=1605&simulationDate=15/08/12)
Internationally comparable data on trade flows are also highly aggregated according to commodity type, but not uniformly. Identifying product categories by terms such as ‘prepared’, with few further subdivisions, does not adequately represent the complexities of international trade in seafood. For the species under consideration, the level of disaggregation is extremely low, with disaggregated HS codes favouring traditional species of the EU, such as salmon, cod, herring and tuna. This is similar for tilapia, which is almost all but hidden as a distinguishable category in internationally comparable trade data.

Tilapia is particularly difficult to follow in international or national trade statistics using HS Codes as tilapia is often amalgamated with other freshwater fish species (Table 2). Since 2002, the FAO has collected specific data on trade in tilapia. However, imports of tilapia to the EU cannot be determined by country of origin using this database.

<table>
<thead>
<tr>
<th>Table 2. HS Codes for Tilapia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section</td>
</tr>
<tr>
<td>I</td>
</tr>
<tr>
<td>I</td>
</tr>
<tr>
<td>I</td>
</tr>
<tr>
<td>I</td>
</tr>
<tr>
<td>I</td>
</tr>
<tr>
<td>I</td>
</tr>
<tr>
<td>I</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>I</td>
</tr>
<tr>
<td>IV</td>
</tr>
<tr>
<td>IV</td>
</tr>
<tr>
<td>IV</td>
</tr>
<tr>
<td>IV</td>
</tr>
</tbody>
</table>

* The use of the term ‘all’ is added by the author to clearly show where HS codes cover all types of freshwater fish and not just tilapia.
The terms shaded in grey denote levels of disaggregation that cannot be compared internationally.

Source: http://online.businesslink.gov.uk

As is clear from the tables above, internationally comparable data on trade flows are highly aggregated according to commodity type, but not uniformly. Nonetheless producers and marketers identify products according to highly precise categories that go beyond method of preparation such as ‘smoked’ or ‘canned’ (which is already aggregated for the species under consideration) to, inter alia, whole\(^4\), drawn\(^5\), dressed\(^6\), steaks\(^7\), fillets\(^8\), butterfly\(^9\), cured\(^{10}\), cold-smoked\(^{11}\), hot-smoked\(^{12}\), dried\(^{13}\), and salted\(^{14}\), the presence of skin, whether shrimp and prawn have tails on or not, are in sauce, skewered; by weight, portion size, pack size and type of packaging.

Such depth of data is entirely lost within international trade statistics and yet is precisely the sort of market information that needs to be generated for chain participants to identify niches and market segments, understand and meet consumer demands, respond to emergent market trends and drive new product development (NPD). The combined nomenclature arguably does not accurately represent international trade in seafood and often masks important categorisations that would be useful for and valued by chain agents in order to understand their products’ final destination and consumption. This obviously raises questions about the ability of developing country producers and other value chain agents to access, understand and make use of such information. Moreover, the embedded acceptance of such opacity may encourage chain actors to overlook emergent opportunities for fresh insights.

Sub-markets and product categories important to certain consumers have to be understood by producers in order to provide product attributes that meet consumer values. This is a crucial aspect for the generation of accurate market information. We undertook a review of European, national and industry-level literature on the EU seafood supply chain in an attempt to use this literature to identify consumer values attached to final product categories. Each European Member State with an interest in fisheries or aquaculture collects data that have to be submitted to the EU through a standardised and harmonised process. These are generally published by national statistics offices. However, the amount of analysis generated by governments and released as analytical publications varies between the countries. This is because not all countries collect data to the same level of detail and not all Member States define value chain levels (nodes) in the same way. Consequently, secondary data is more abundant for certain chains than others. For example, although national customs authorities are entrusted with the registration of import and export flows and supply

---

\(^4\) Marketed as caught.
\(^5\) Only entrails removed.
\(^6\) Scaled and entrails removed (ready to cook).
\(^7\) Slices cut crosswise.
\(^8\) Boneless pieces cut from the sides.
\(^9\) Two sides cut away from the backbone.
\(^10\) Cured by smoking, drying, salting or pickling.
\(^11\) Cured and partially-dried.
\(^12\) Partially or wholly dried.
\(^13\) Air or heat-dried and salted.
\(^14\) Dry-salted or brine-cured.
COMEXT\textsuperscript{15} with harmonised data, there are gaps between national customs data and COMEXT. Although these are marginal at the aggregate level, they are more significant at the detailed product level, hampering in-depth market analysis and the identification of end-markets (Döring and Guillen 2010). In addition, much of the information suffers from similar issues of aggregation mentioned earlier.

National statistical production and trade data as well as information pertaining to seafood value chains is also available through industry associations, trade reports and associated trade literature. Much of this literature relies on official government data, and the ad-hoc surveys and reviews that build on this data suffer from its inherent problems. The basis on which data is collected on seafood supply chains after the point of first sale varies from country to country. Where data exists, it tends to be categorized in very broad terms, particularly for the human consumption sector. Furthermore, domestic political changes affect the collection of data which may lead to discontinuity in time series.

Problems of disaggregation, a lack of data availability in general and inconsistent depth and breadth of information for certain value chains nodes, mean that final markets, essential to understanding consumer values, are extremely difficult to identify. It is therefore virtually impossible to use secondary data sources on which developing country exporters may rely to accurately identify end markets.

The second aspect of market information is consumer demand, and particularly the product attributes that meet consumer values. Interviews with EU seafood professionals from a variety of seafood business and institutions revealed the most important consumer values\textsuperscript{16} (Table 1). The country of origin of the respondent is highlighted in brackets\textsuperscript{17}.

![Table 1](image)

\textsuperscript{15} The EC's generalised system for storage, extraction, aggregation and dissemination of statistical data. COMEXT is used by EUROSTAT to manage Foreign Trade Statistics.

\textsuperscript{16} In their views.

\textsuperscript{17} BEL = Belgium; DEU = Germany; FRA = France; GBR = United Kingdom; NLD = The Netherlands
A number of responses are worth investigating further. The importance of *low-priced seafood* cannot be underestimated and is an important consumer value in seafood markets, evidenced by the large number of respondents who mentioned it. At the same time, for seafood professionals, *food and brand safety* are a mandatory aspect of seafood trade and as the most basic attribute on which other values are built. Therefore, despite low-price values, there may be a minimum price that consumers expect to pay as an indicator that sufficient attention has been paid to producing a safe product.

Value chain members highlighted *quality* as an important consumer value but quality means different things in different markets. This is applicable to various countries as well as value chain strands, where quality attributes may be valued differently. Quality is particularly important in retail chains as a product differentiator and to support brand messages, and therefore persistent and consistent quality is critical. The high response by value chain respondents to the consumer values of “low price” and
“quality” would appear to be mutually exclusive, yet interviews revealed that suppliers feel under intense commercial pressure to do so.

In response to consumer demands for increased product information, a proliferation of certification schemes and recommendation lists for sustainable seafood products has evolved. These seek to influence market demand for seafood by encouraging compliance with a varied mix of rules, regulations and recommended practices. However, respondents across all the countries and at different value chain nodes agreed that it is only a very small minority of consumers that genuinely care about seafood sourcing. Every seafood company interviewed had an internal sustainable sourcing policy, yet believed that price generally overrides the value for sustainability.

Availability, especially consistent availability, is an important value for retailers, and consequently for their suppliers. Farmed seafood production contributes to the provision of consistent volumes due to greater control over production processes. An inability to provide the required supply could lead to a change in status of the relationship between supplier and buyer and even affect the reputation of the supplying country. Buyers do not only want high volumes but uniformity within the volume required and also between orders, which is more likely to favour large suppliers.

Accessing this type and depth of market information by value chain agents can be difficult and costly. Although EU value chain agents also experience these costs, developing country suppliers may be particularly disadvantaged. This may result from all or some combination of their lack of knowledge of how or where to access market information, financial barriers to entry, a lack of interpretative ability and background contextual market intelligence. In addition, secondary data sources are not sufficiently disaggregated to be meaningful, so that final markets, essential to understanding consumer values, cannot be identified.

**ADDING VALUE THROUGH IMPROVED ACCESS TO MARKET INFORMATION**

One solution raised during interviews was the European Market Observatory for fisheries and aquaculture products (EUMOFA), proposed by the European Commission. This initiative focuses on price-setting in the EU seafood market and how value addition is transmitted in seafood marketing chains. Such schemes could be extended and adapted to provide a platform of information that would facilitate developing country access to the EU seafood market. For this to be successful, information needs to be broader than a narrow focus on prices in order to increase EU market understanding for Asian value chain agents. Greater assistance in interpreting data and adapting value chains in light of market information is necessary from a variety of institutions that include NGOs, trade associations and governments, particularly where few incentives to alter the extent of current information dissemination within the value chains exist.

---

Forging direct links between suppliers in Asia and buyers in the EU is another method of ensuring greater market orientation along the value chain. The research showed that such investment may lead to shortened supply chains (thereby reducing the number of nodes through which information travels, improving accuracy), transfers of financial and technological investment directly to producers, and increases overall chain competitiveness through value maximisation at each node. Such undertakings require investment, energy and conviction on behalf of the participating EU value chain agents - and the potential burden is reflected in there being only one example identified during the course of the research. The comparative scarcity of such schemes points to the large investments required and uncertain returns, but nonetheless might still provide an example of what can be achieved through high levels of support and investment by EU value chain agents.

The beneficiaries of proactive governance in the example were small-scale suppliers. This is perhaps because the costs of access and response to market information are relatively higher for small-scale suppliers than large suppliers. Rising levels of codification, extensive levels of traceability required along the length of the chain, and increasingly stringent mandatory and voluntary standards are likely to be easier for large-scale producers to absorb. Long market chains and complicated marketing processes increase uncertainty and risk, more so for small-scale farmers. A further reason may be that small-scale suppliers individually do not pose a threat to the overall power held in the chain by EU value chain agents. This means that EU value chain agents may invest proactively so long as they do not feel threatened by the recipients of the benefits. There was insufficient opportunity in the research gathering stage to focus more intently on this area. However, obtaining a more accurate overview of the extent of assistance in chains would identify key criteria for developing country participation in such projects, and determinants of success that guarantee more stable business relationships.

Further research is required on the number of projects, investments involved, beneficiaries and returns, in order that similar linkages may potentially be developed in other value chains from developing countries. Similar links might increase coordination between weak and strong suppliers and contribute to private sector development assistance. The role of EU importers for such developments is likely to be critical. Importers are aware of market demands transmitted through the chain from retailers and foodservice agents, but are also aware of supplier competencies and the current abilities of producers to respond to such demands. Importers are therefore uniquely placed to transfer relevant knowledge and technology to specific nodes. Although importers may not view such activities as in their business interests, the involvement of importers in ongoing proactive governance projects testifies to the benefits accrued through this type of investment. These could be better-supported and expanded through NGO and national government development cooperation.

The implications for broader seafood trade is that strengthened linkages may be sought in value chains, but that these are likely to be between very poor suppliers who have few opportunities to otherwise engage directly with buyers, while more competent suppliers and large processors may not need to benefit from these types of relationships. In fact, it may be medium-sized enterprises that find themselves too big for such partnerships with EU value chain agents, but too small to benefit from the economies of scale that are advantageous to large suppliers. This may result in greater
incentives for medium-sized enterprises to shift supply to other Southeast Asian markets, or to where competitive advantages can be gained. Alternatively, associations of medium-sized enterprises or links between such enterprises in Asia and the EU could provide the necessary increased support through targeted assistance. Notwithstanding the limitations, large and medium-sized value chain agents in developing countries can obtain competitive advantages relative to smaller value chain agents within the country, or even compared to value chains from other countries. For example, large and medium-sized processors may have the resources to have more information relative to smaller players in value chains, and therefore they gain competitive advantages. Such a case was found in Thailand, where the largest processor has the skills, capital and capabilities to have established market offices in the EU. Further research on firm size should be able to shed more light on what is potentially a complex matter. For instance, more important factors of competitive advantage may be the possession of a brand or status as a preferred supplier, rather than the size of the firm itself.

CONCLUSIONS AND POLICY IMPLICATIONS

Weaknesses in governance and industry development and relationships between production and market agents undermine supplier power by reducing access to market information, lessening incentives for sharing information, and restricting value-creating capabilities. At the same time, costs and benefits associated with information dissemination will underpin all agents’ decisions about how much information to generate and disseminate. In the EU seafood market, the presence of extensive collaboration between agents in the seafood industry is in contrast to relationships with many of their suppliers. EU agents have reduced incentives to share market information in order to maintain balances of power in supplier-buyer relationships.

Over time it might be anticipated that the traditional advantages of superior market information held by downstream actors might lessen due to the increased availability and potential transparency of market data emergent through ICT technical progress. The reducing costs of data generation and interrogation hold the potential for producers, even if remote from their target markets, to gain a superior understanding of trends. As the granularity of available data increases to incorporate both qualitative and quantitative attributes, this advantage is liable to become more significant. Faster tracking of market trends, also enabled through improved ICT, should also enable more apposite proactive responses by upstream actors rather than having to rely upon the historic trickles of information leakage.

The generally low market orientation of the seafood value chains examined (despite some exceptions to this tendency) highlights one of the problems of the market orientation approach, in that it assumes that value chain agents wish to share information in order to maximise the competitive advantage of the chain. Critically, the possession of market information is clearly one way for value chain agents, particularly those downstream, to guard knowledge - and therefore power - for themselves. EU firms have to realise that increased sharing of market information leads to increased value added along the length of the firm, raising overall levels of value for all. The key to meeting the challenges of globalisation, without compromising the advantages that international seafood trade gives rise to, lies in developing and implementing coherent governance frameworks around these issues.
References


